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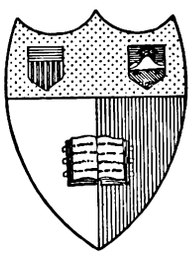

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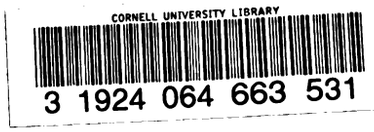

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Electric Railway Journal

Volume 59

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Instructions for Use of Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, or to the state matters of any particular state. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the electric railway, city or state to which the article applies. Groupings are made under the name of the city in which the main office of the company is located, but an exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad. City or state affairs appear under the names of the city or state involved.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into thirteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index unless, like "employees," they appear also in small type. As an example of how to use the index, if a reader wishes to locate an article on special trackwork he would obviously look in the list under the general subject Track and under this caption, only special trackwork could apply to the article in question. The reader would therefore refer to this keyword under S in the body of the index.

In addition to the groups of articles covered by these headings the papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair shop equipment" and are not indexed alphabetically, because of the fact that there is a wide choice in most cases of the proper keyword to be used.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION
Accident claim department
Accidents (including wrecks)
Safety first
Storm and fire damage

CARS AND OTHER VEHICLES
Automobiles
Cars (including car design)
Locomotives
Motor buses
Motor cars, Gasoline
Motor trucks
Service and tower trucks
Trackless trolley
Work and wrecking cars

CAR EQUIPMENT
Bearings
Brakes and compressors
Current collection
Electrical equipment
Fixtures
Gears and pinions
Motors
Trucks
Wheels and axles

EMPLOYEES
Employees
Labor
Strikes and arbitrations
Wage decreases
Wages and working agreements

FARES
Fare collection (including apparatus)
Fare decreases
Fare increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS
Abandoning of lines
Accounting
Appraisal of railway property
Financial
Franchises
Insurance
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Service at cost
Statistics
Taxes

HEAVY ELECTRIC TRACTION
Heavy electric traction (general)
Locomotives

MAINTENANCE OF EQUIPMENT
Insulating materials
Lubrication
Maintenance practice
Metals
Purchases
Repair shop practice
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

POWER
Energy checking devices
Energy consumption
Fuel
Overhead contact system
Power distribution
Power generation
Power stations and equipment
Substations and equipment
Switchboards and equipment

STRUCTURES
Carhouses and storage yards
Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals
Waiting stations

TRACK
Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRANSPORTATION
Freight and express
Interurban railways
Merchandising transportation
Publicity
Public, Relations with
Schedules and timetables
Signals
Stopping of cars
Traffic investigations
Traffic regulation
Traffic stimulation
Transportation, Metropolitan

MISCELLANEOUS
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Engineers
Living costs
Management
Municipal ownership
Radio telephone for railways
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Snow removal
Standardization
Subways

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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The Sales Idea Must Be Put to Work

ONE of the tangible results of the past year has been a definite entrance of the idea of salesmanship into the electric railway industry. He who rises to say that "merchandising transportation" has always been with the industry as a phrase should be told that that is only a part of the big idea which is really being turned into action in various places.

Salesmanship in the electric railway industry is something more than the mere selling of more rides. It is the largest factor in making a business out of the industry, or of putting more business into the industry.

This sales idea must be pushed and made more effective in 1922 than it has been so far. Surely those who have done something real in the way of putting more salesmanship into their business have reaped results to which they are glad to point for the benefit of doubting Thomases.

The trouble is usually that each man sees how salesmanship works some place else but doubts its efficiency on his property. The ELECTRIC RAILWAY JOURNAL hopes to continue its efforts to keep this idea, which seems valuable, before the industry by showing, during the coming months, actual examples of what real salesmanship is and means. It is the small, homely act which does the work, supported and inspired by a real selling instinct.

One fact should remain clear: Those who have done the most to promote the idea do not propose a separate sales force as an appendage to the organization, but that the whole organization be inspired with the sales instinct by having a salesman at the helm. Mr. Goodwin's citation, at Atlantic City, of Mr. Budd as the typical "sales manager" he had in mind is a concrete illustration of what is meant.

The sales idea must be put to work even more intensively. May 1922 see an accomplishment in this line which will show indisputable advantages resulting therefrom.

The "One Price, Single Coin" Idea Wrecks Another Industry

AND now the "Dollar Watch," of Ingersoll fame, has succumbed to the same sort of plague that smote the railways, with their "Flat 5-Cent Fare" slogan. The two cases are so much alike that we of the electric railway industry look with sympathy and understanding on the present troubles of the Ingersoll company. Here was a huge business, built more around the "dollar" than around the watch. It was undoubtedly the stress laid upon the fact that it was a *dollar* watch, a single coin (or bill to the effete Easterner) purchase which did most to build the huge successful business that the Ingersoll watch once enjoyed. It was the attempt, forced by economic conditions, to sell the watch at its worth with depreciated currency that wrecked the company.

It is not necessary to review to electric railway men the troubles into which the flat 5-cent fare—once the greatest talking point of the industry—brought the electric railways of this country. However, it is believed that it will be valuable for all railways to call public attention to the basic cause of the Ingersoll situation as an argument to show why railway fares should be such as to pay for the service rather than to be based or judged on the old flat 5-cent fare.

This should also be another impelling motive for railways to study their fare schemes to see if it is not advisable to get away from the "flat fare" as well as the "flat 5-cent fare." The industry is still experimenting on fares, as Mr. Storrs so ably pointed out in these columns just a year ago. The results of the experiments should be such as not to embarrass the industry in some future crisis by having a fare scheme, a price, which seems more important to the public than the service received.

The New Year Holds Promise for Further Sound Advancement

A YEAR ago, while other industry was in the throes of trouble from which it has only partially, if at all, extricated itself, we expressed a faith in the electric railway industry, in its ability to make 1921 a prosperous year. That, on the whole, it has done so to a degree unequaled by other industries is indicated in the rest of these pages. While other industries, even other utilities, have suffered depressions in 1921 heretofore unequaled, there has been a steady up-grade movement with the electric railway industry. The seeking out of weak spots has played as important a part as making strong spots grow.

And what of 1922? The whole world seeks as never before—at least since the cry of humanity for a leader nineteen hundred and twenty-two years ago—for leadership and sane thinking to make an end to destructive forces and to strife. Social and industrial welfare everywhere hangs in the balance with such momentous problems as the world's peace, discussed in the Disarmament Conference; as Irish peace, now seemingly assured, and as European economic adjustment. The effects of the results of such questions will be felt directly in industry as well as in social advance.

The electric railways cannot escape their relation to other industry if they would. They are, however, in a more advantageous position, a more secure position to meet the problems of the future. This future is, as always, in the hands of electric railway men themselves, and success or failure will be credited accordingly to them. But with a public greatly enlightened through the efforts of the past year, with a start made toward rehabilitation of properties weakened by the stress of war times, with a growing appreciation on the part of the investing public of the intrinsic value of investment in substantial securities of necessary industries, the problems of the coming year should be more closely

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identified with improvement in equipment and service, to get ahead of the times in an operating and a business way. As we said a year ago, the new year still contains problems and difficulties. "It is merely that they are different ones" in 1922 "from those that have gone before and been long since overcome or solved successfully."

And so 1922 is faced hopefully, more so even than 1921. It should be a year of secure advancement for the industry, a year for it to place itself even more firmly as an established necessary, useful and successful public industry.

Taxation Affecting Electric Railways—Outlook for Progress in 1922

THAT the present situation of the electric railways with reference to taxation is intolerable and cannot continue indefinitely without remedy is well known to the guild but is not known to outsiders generally. Radical changes are imperative, but the possibility of securing these changes practically coincides with the possibility of bringing to the public a real appreciation of the facts and their implications. There are some indications that progress is being made with this task of education and that 1922 may see some real accomplishments in the direction of more fair taxation of electric railways.

Congress, of course, can do little and will probably do less. The new revenue act of 1921, passed a few weeks ago, with its corporation income tax rate of 12½ per cent, increases rather than decreases the burdens of the industry. No one is satisfied with the new law and it is quite possible that there will be a revenue act of 1922. What its character will be the agricultural bloc will probably determine. But it seems scarcely reasonable to expect that reduced corporation taxes will form a part of the program.

It is entirely reasonable, however, to anticipate favorable action of Congress on the proposal to eliminate tax-exempt securities. The apathy which has been shown at the Capitol toward this measure should be dispelled and the issue forced to a decision. Its importance to the electric railway industry justifies exerting every effort in its support, as has frequently been pointed out in these columns.

Yet the least of the problem does not lie here. The taxes which really hurt, the ones which are forcing companies into bankruptcy, are those imposed by the states and localities. For the most part these taxes are a heritage of old franchise agreements and legislative compromises handed down from an age when conditions were essentially different from those which now obtain. Taxation in practice, and to a large extent in theory as well, has failed to keep pace with the changes in the economic and social conditions surrounding public utility operations. Variations in rates of fare have not been clearly articulated with changes in rates of taxation. Gross receipts have shown no close correlation with the Bradstreet's index number of wholesale prices, consequently taxes on street railways have come to bear no relationship either to ability-to-pay or ability-to-shift.

In various parts of the country the taxing authorities are beginning to take cognizance of the situation and the coming year should yield the first fruits of these new attempts to consider the problem. New York is one of the states which has been investigating its public utility taxes. Senator Davenport's joint legislative committee on taxation has made an exhaustive statistical inquiry during the past year and is expected to submit the results to the New York Legislature within a few days, together with its conclusions regarding the changes which should be made in the tax laws. This report is being awaited with great interest by the electric railway men of the state.

The time has come when it should be possible to secure agreement upon a set of principles governing the taxation of public utilities such as electric railways. Precisely what justification is there for the taxation of such companies under a system of controlled rates? What are the charges properly attributable to the companies for police protection and other municipal functions? How much of the "paving charges" are true costs and how much are taxes? Is there any excuse for taxes of this character? These are some of the questions which will be actively debated in the legislative hearings of 1922. The industry must co-operate in arriving at satisfactory answers—answers which will be fair and equitable from the point of view of all concerned. In this direction lies the prospect for real improvement in the tax situation of the electric railway industry.

Interurbans

Progress in 1921

ONE of the notable developments in the interurban field in 1921 was the advent of the light-weight one-man interurban car for use on the short lines where traffic and speed conditions do not necessitate heavy equipment nor the services of two trainmen. This type of car has proved highly satisfactory, and its substantially lower operating costs offer an opportunity in a number of instances to make operation pay where it is now unprofitable. Ways and means of financing such equipment to replace the old heavy two-man cars could, therefore, well be studied and vigorously pursued in 1922.

The automatic substation has played an increasingly important part in interurban operation during the past year, and its further application during 1922 is fully to be expected because of the very substantial savings it effects. A return on the investment of 50 per cent in one case comes to mind. An interesting possibility for 1922 in connection with power supply is the trial of mercury-arc rectifiers as a substitute for rotary converters. A foreign manufacturer who has built several installations for European electrifications that are reported to be successful is now offering to supply them here. Undoubtedly our own electrical manufacturers have been working along this line, and if the device comes out for trial in 1922 and is found practical, it will have a far-reaching influence on all future interurban, and also heavy traction, work.

From the standpoint of progress in engineering matters and standardizing of equipment design and maintenance practices, the formation of the engineering council of the C.E.R.A. is perhaps the outstanding development of the central territory, the great interurban region, during 1921. The coming year will witness some of the fruits of the labors of this body, and they promise to be good. There is ample opportunity for some real economies to be accomplished, not to mention the better operation that will result, if this council approaches the potential possibilities before it.

Perhaps the most serious development of 1921 has been the continuing growth of motor bus competition.

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This is a difficult problem to handle, particularly where the state commission has not yet been given jurisdiction over bus transportation. In such cases the problem is largely one of salesmanship and adjusting the service to meet the new conditions. Probably the best course for the interurbans is to cater especially to the longer haul traffic by providing more and faster through trains. For the short hauls it is more difficult to compete with the bus, but for fast, comfortable, long-haul service the electric line has great advantages and should make the most of them. A number of new fast trains have been inaugurated during 1921 and practically without exception have met with very good success. No opportunity should be overlooked, however, in coping with this form of competition, to endeavor to work with the bus owners a plan whereby they will operate in conjunction with rather than in competition with the interurban. In many cases it is believed that such a plan of co-operation can be effected with resultant advantage to both railway and bus line.

The year 1922 brings new problems—let it also witness new methods of solution, more salesmanship and more "ginger."

Standardization Is Essential to Prosperity

THE standardization of a product ultimately benefits the user, the manufacturer and the producer of the raw materials that enter into it. The user is benefited by the interchangeability of parts, by the decreased stock necessary for maintenance and by the reduced cost of the product. The manufacturer's output can be increased with the same working force. Equipment and tools necessary for manufacturing can be decreased and a higher quality product with less rejections can be obtained. The producer of raw materials can develop a business of greater magnitude in a relatively few forms or compositions, whereas without standardization he would be called on to satisfy many varying demands.

With these recognized advantages why is there in some instances an antipathy to this work? Some old-time designers seem to feel that standardization hampers their expression of individuality and prevents progress. Some manufacturers have voiced the opinion that standardization removes a valuable basis of competition. These differences of opinion arise, no doubt, from a misconception of the economic field for standardization. Manifestly if we should attempt to standardize complete units as by covering in one specification the details of design for a complete car or truck of a given capacity we would be standardizing output rather than details and materials. The greatest benefit to electric railways will come from standardizing small detail parts, ruling dimensions, tests for materials and methods of manufacture. With such there will be no sacrifice of individuality and the designer can devote his attention to more important considerations.

At the present time the work of standardization is going forward all over the world with surprising intensity. During or since the war national engineering standardization bodies have been formed in ten foreign countries. Great Britain and Germany are taking the lead in developing standards on a broad scale. In England, the government has appropriated several million dollars toward the work, and in Germany there are 5,000 firms which are contributing members of the central organization. These two countries are America's chief industrial competitors, and the feeling is very general in each that standardization will be a most essential element in the development of foreign trade. It is interesting to note that Germany appears to be devoting her efforts toward standardization of manufacture rather than that of materials so that both labor and material will be saved by simplification of design.

In the United States the American Engineering Standards Committee was organized in 1918, but it has been in active operation only a year. At present there are nearly 150 engineering societies and trade organizations which are co-operating in the work. The American Electric Railway Association is a member of this group and is taking an active part in all standardization work of interest to the electric railway industry. Another advantage to the engineers and organizations engaged in this work is that thereby they are brought into close contact with the leading minds in all branches of engineering work. This increases and broadens the vision necessary for solving the problems in hand. For some time past there has been a pronounced feeling that our industries were functioning too much as independent units. The standardization movement is one of co-operation throughout each branch of industry, as well as between the different branches whose interests touch and overlap. It is not too much to say that standardization offers a major opportunity toward the integration of our industries on a national scale, so that they may function in a purely national way.

In the present period of readjustment a decrease in the cost of electric railway equipment is imperative. Such a reduction can come from more efficient methods of manufacture without lowering the quality of the raw materials. Standardization presents a means for obtaining greater production at less cost and for maintaining a high quality of equipment with fewer defects.

Rolling Stock Purchases Reach a New Low Level

THE annual compilation of statistics in this issue presents two noteworthy facts. First, rolling stock purchases during 1921 were the lowest recorded since these tables were begun in 1907, and, second, the mileage of track reconstructed is the greatest since record of this was started in 1917. The low ebb which equipment purchases reached has not failed to have its effect on the total rolling stock owned by the electric railway industry. The aggregate figure for 1921 shows that this new equipment lacks about 300 cars of replacing that retired during the past year. The track mileage reconstructed has no effect, of course, on the total mileage, but the new track built last year has been insufficient by approximately 150 miles to keep the total mileage from decreasing. The complete statistics of track in operation show that this total mileage is now 47,555.

Statistics are subject to a wide and varied interpretation. The causes of these changes are perhaps more easily traceable than the results. The predominating cause, of course, has been financial difficulty. Though the decrease in the number of cars and in the total mileage is quite insignificant when taken on a percentage basis, in stringent times it is but natural that money should be spent where it will net the highest return. Likewise, existing equipment has been worked to its utmost capacity. Therefore there is nothing alarming in these figures, which merely show that it has been necessary to abandon non-essentials.

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The low record of car purchases is readily accounted for by the serious financial problem that the railway industry has had to solve. Price readjustment has been taking place, and no doubt railway officials are putting off the purchase of much needed rolling stock as long as possible. The only large order for cars in the United States was for the new municipal line in Detroit, Mich. Aside from this order of 225 safety cars and fifty of the Peter Witt type, there were but 1,188 other passenger cars ordered. These were divided among 984 for urban service, 129 for interurban service and seventy-five for rapid transit lines. When these 984 cars purchased during 1921 for urban service are compared with the 1,699 safety cars purchased during 1920 for service in the United States the result is somewhat startling. Safety car purchases decreased to 565. The ratio of safety cars to total passenger cars purchased for urban service has been decreasing slightly for the last three years, but safety cars still constitute more than half of this total.

Reconstruction of old cars has been quite active. An effort has also been made to find out the number of old cars reconstructed for one-man operation during the past year. The data obtained show 320 cars reconstructed with safety devices and 268 cars without safety devices. Several roads are operating cars with one man by simply closing the rear doors. Such cars are not included in the figures just quoted.

The amount of new track built during 1921 is about the same as for the preceding year. The city of Detroit with 46 miles of new track construction is the only place where lines were extended to any appreciable extent. The remainder is made up of turnouts, sidings and short connections. These figures indicate that extensions have practically stopped.

A total of 615 miles of track were reconstructed, as compared with an average of 320 miles per year for the preceding four years. This shows that the track forces of the various railways have not been idle. Electric railways also have not rebuilt track unless it has been found absolutely necessary. This increase in track reconstruction thus appears to be the result of deferred maintenance during the past three or four years.

United We'll Progress— Divided We'll Never Get Anywhere

THE electrification of railroads is not making the progress that it should, due, among other things, to the unfortunate circumstance that the engineers seem not in all cases to be agreed on fundamental data. Conditions are better than they once were, but the lack of unanimity is bound to be confusing to railroad managers and boards of directors who are now or will soon be considering the advisability of using electric motive power. Some years back there was a merry war over the relative merits of two rival systems of electrification. This undoubtedly served to bring out a lot of information, but it could not but confuse the non-technical student of the subject. Apparently not all of the engineers themselves were entirely clear in the matter. Now, debate seems to center on such topics as the relative coal consumption, or its equivalent, in steam locomotives and in power plants furnishing power to electric locomotives, the relative costs of maintaining steam and electric locomotives, etc.

As a matter of fact these questions form the subject of quite a lively controversy in the columns of the *Railway Age* in recent issues. This was given its impetus by the report of the United States Geological Survey of the Department of the Interior on "A Superpower System for the Region Between Boston and Washington," which had much to say on the electrification of railroads in the New England district and southward. This report, it will be remembered, was prepared under the direction of W. S. Murray, and the section on electrification was the work of Dr. Cary T. Hutchinson and associates. Messrs. Murray and Hutchinson have devoted many years to the study of railroad electrification and have applied the results of their study on a considerable scale. What they know and feel about it should therefore have much weight with railroad men and others who are to have a hand in applying electric motive power to steam roads. The data and estimates which they have reported, however, have not proved entirely convincing to all railroad men, at least as far as the mental attitude of these men is reflected editorially in the *Railway Age*.

The position taken by the *Railway Age*, to quote from one of its editorials on the subject, seems to be this: "Unfortunately because of such statements [several being cited that were considered unwarranted by the editors] the data presented must be accepted with reservations . . . In using the report as a guide it would appear that it must be done with discretion." Messrs. Murray and Hutchinson reply that the *Railway Age* editors did not study the report carefully. This charge is promptly refuted, and so on. The *Railway Age* editors think the superpower experts assumed too much; in reply they are told that the "assumptions" are based on accepted data. Thus the fur flies.

In so far as this battle between the exponents of conservatism and enthusiasm with regard to railway electrification brings out facts, it is valuable, but it cannot compare in value with emphasis on agreed points. There is no doubt of the fact that the *Railway Age* appreciates the report on superpower as a whole, while Messrs. Murray and Hutchinson no doubt realize that the *Railway Age* believes in electrifying the railroads as extensively and as rapidly as economic conditions seem to it to warrant electrification. To be sure, the *Railway Age* editors think that Messrs. Murray and Hutchinson desire to go too fast. Per contra, these gentlemen apparently consider the *Railway Age* ultra-conservative. It is a question of speed, not of principle.

In the controversy the ELECTRIC RAILWAY JOURNAL, standing on the side line, has no desire to interfere; the parties concerned are fully capable of handling their respective ends of the discussion. The JOURNAL does regret, however, that there does not exist that much desired and urgently needed American Committee on Electrification (under whatever name and auspices it may be called together) because such a committee could act as a clearing house for information of a character that would make a difference of opinion as to data impossible. The present controversy hinges on such items as coal consumption of steam locomotives and of power plants, maintenance costs of steam and electric locomotives, basis of comparison of steam and electric locomotive performance and such details. These are questions of fact, not opinion. Facts are usually determined by jury on the basis of evidence. What better jury could there be than an American Committee on Electrification? Once the facts are agreed upon, the course to be taken will be much clearer. Everybody wants to take the right course. Why not get together?

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Fundamental Conditions in the Industry Are Better

ALTHOUGH the statistics of cars purchased during the past year are the lowest since this paper has compiled these statistics, or since 1908, the properties themselves at the beginning of 1922 are undoubtedly on a better financial basis than at any time for five years or more. Conditions may not be all that could be desired in the electric railway business, but they are returning to normalcy.

As in other lines of business, gross earnings have shown a tendency to decrease during the past year as compared with 1920, particularly since July 1, but it has been possible generally for companies to reduce their operating expenses so as not to increase their operating ratio. This is clearly shown by some figures for the first nine months of 1921, representing about 25 per cent of the total earnings of the industry and made public by the association last month. These returns show an increase in gross for the nine months compared with 1920 of about 2 per cent and a decrease during the third quarter of about 5 per cent. Nevertheless, in both periods, the operating ratio in 1921 was lower, *i.e.*, in the nine-month period the reduction compared with 1920 was from 76.6 per cent to 75.5 per cent and in the three-month period from 78.6 per cent to 75.1 per cent. Ability to reduce operating expenses proportionately with the falling off of gross receipts may not comprise the highest hope or ambition for the industry held by a stockholder. Nevertheless, it is a valuable quality, and when general business conditions change some of the economies effected will undoubtedly be retained. Incidentally, there are probably few large industries which can show during the first nine months of 1921 an increase in gross of about 2 per cent as compared with 1920 and an increase in net of about 9 per cent, yet these are the figures of the group mentioned.

The improvement thus shown is based on fundamentally better conditions in the industry, entirely apart from and in addition to the falling cost of labor and materials and even permission to charge higher fares. These additional bases for hope for future sound electric railway finances may be summarized as follows: (1) Recognition by the public that electric railway receipts shall be adequate to pay all costs of operation, including depreciation and a return on a fair valuation; (2) a growing acceptance of the principle that local transportation must be a monopoly and consequently that unregulated jitneys must be suppressed, and (3) the impossibility in two or three notable instances of finding any substitutes for electric cars as a means of mass transportation.

This does not mean that all of the financial troubles of the electric railways are past, or even that the critical condition of many are yet over. Special local conditions, such as inadequate fares, still hamper many companies and these must be remedied. In a great many other cases operating deficits of considerable proportions were accumulated during the war. Some time must elapse after net receipts have reached a reasonable amount to allow the companies to put the properties in good physical condition. With the reestablished credit which these net earnings will bring, however, it will be more easy for the companies to undertake the rehabilitation required. The track probably suffered more during the war period from lack of maintenance than any other part of the equipment, and as earnings increase it will be part of wisdom for the companies to rehabilitate their track promptly. In this they will undoubtedly bear in mind such changed conditions as have been caused on most properties by the addition of lighter rolling stock.

Another criterion of the financial conditions of any industry is the number of companies which have gone into receivership during the year. In the case of the electric railways this is slightly less than 1920 and much less than in 1919. This and the attendant circumstances, as explained in the text accompanying the table on receiverships, show a sounder condition of the industry than has existed for some time past, and while there have been many threatened abandonments and many short sections of track actually have been given up, there have been very few total abandonments of service by entire companies.

Statistical Service Extended to Automotive Equipment

ONE often hears the perpetual grouch bemoan the fact that electric railway operators, from president to master mechanic, don't have to ride in their own street cars, but are provided with automobiles by the company. This is a conception that gained wide currency during the years when automobile cushions grew softer and the wheels of electric railway cars lost their circular shape. The ELECTRIC RAILWAY JOURNAL now steps in with statistics, one of the customary editorial weapons, to show that propagators of such ideas are mistaken in their major premise. Our figures show that there are not sufficient passenger cars in the industry so that even one could be allotted to each property! To go further, the majority of these automobiles classed as passenger cars come under this designation only because the passenger body has not been replaced by a service body, although the car is really used in connection with line or track maintenance. Very few of the cars, of the limousine and coupé type which always appear promptly to convey the president to and from his office, could be found in the reports submitted by the various companies. A total of forty for this type appears almost insignificant in comparison with the size of the industry and, in fact, also with the actual inherent necessities of the industry.

As far as service cars are concerned, their number is roughly a thousand, or nearly twice the total of the passenger automobiles. The figure shows that automobile equipment for tower wagons, line and track maintenance and emergency uses has a very definite and valuable function as an auxiliary to other rail-borne service cars. The larger electric railways may have use for both kinds of service cars, but it is probably much better for the railways which have only a few miles of track to put whatever money they have to spend for such equipment into rebuilt rail-borne service cars.

The totals to this compilation are probably most interesting because of the difficulty in assigning so handy a vehicle as an automobile to any definite duty. A relative idea of the number of service automobiles compared with the number of cars operated by electric railways may be gained from the fact that there is one automobile for about every 110 cars. This ratio is nearly the same as that of rail-borne service cars to total rolling stock.

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Association Activities Useless and Useful

THE statement "there are too many associations" is heard so often and rings so true that those in charge of the operation of associations have a duty to make sure of the usefulness of each and every activity. Americans are sometimes called a nation of "Joiners." It is comparatively easy to start an association along almost any line of human interest, activity or fad. All that is necessary is to have some central motive or thought, which may be religious, political, social, industrial, athletic, historical or gastronomic. An active campaign for membership will usually bring in recruits, and another organization is added to the vast number now in the country. Nevertheless, it would not be hard to find a consensus of opinion that there are several associations whose usefulness, if it ever existed, has disappeared or become negligible. As this is true of associations as entities it is also true of the individual activities of some of the associations whose general usefulness is unquestioned.

It is very easy to understand how such conditions arise—an association is formed and a headquarters established; certain activities spring up, committees are appointed, and away they go on programs which soon obtain such a momentum, or the individuals directing them are so wrapped up in them *per se,* that they go on long after their useful function has ceased. As in the case of one branch of the U. S. Army—so the other branches said at one time—it thought the Army was made for it rather than it made to serve the Army.

Associations—voluntary associations, at least—have a great responsibility in the expenditure of funds collected as voluntary dues. In this connection, they are not unlike municipal officials who spend not their own money but from a general public purse and are wont to spend of it more freely than they would their own. In associations of engineers and business men expenditures should be on a higher plane, however, as these associations are operated by men of business who have experience to draw upon and they owe it to their associations to do so.

American Electric Railway Association Performs a Useful Function

AS TO THE American Electric Railway Association, with its affiliated associations, the principal organization of interest to the electric railway field, it is gratifying to point out the useful work which it is doing for its members and the efficiency with which the present organization makes it possible to manage its activities. The headquarters office is on a real business-like basis of operation. The executive committee in its monthly meetings has the opportunity of keeping in close touch with the current operations and, from the tenor of its discussions, is really doing so. This is making for even better and more useful association service and the executive committee will doubtless come more and more to see that the business principles the members apply to their own properties are applied to association affairs. This includes, of course, the point already mentioned of the most strict examination of every expenditure to determine whether it is fully justified by the benefits derived from it. As the annual budget of the association now is in the neighborhood of $250,000, the sums involved are considerable.

When one examines the services of the A.E.R.A. and the affiliated associations, it is very apparent that they are of value not only to the members but to the industry as a whole. That it is appreciated by the members is attested by the more than 10,000 requests for information received by the Bureau of Information and Service. Surely railway companies who are not now members of the association will do themselves, as well as the rest of the industry, a real service if they will study what the association is doing, and, seeing and believing, join.

Elsewhere in this issue, Mr. Palmer and Mr. Kimball show clearly the service which the Transportation & Traffic and the Engineering Associations are organized and prepared to do—are doing, in fact—for the industry. Mr. Todd has recently, in *Aera,* outlined plans for the American Association, and in his interview in the Dec. 10 issue of this paper told his own ideas and gave a picture of what his leadership will be. All these deserve study and prove the value of the association's work, which merits the support of every railway operating and manufacturing company. It is by organized effort only that certain things may be accomplished and advances made.

"Blocs" a Bane to the Railway Industry

AS IN governmental affairs so in the railway industry there has arisen a situation in many localities where "blocs," or groups of individuals, have been formed for the purpose of protecting their several group interests. Labor, the public, capital and the operating management have been forced to separate into such groups and to fight for their several interests through the use of voluntary or compulsory arbitration boards as controlling elements in industrial disputes.

The arbitration board is a method to compromise ethics and not morals, is correct in principle and is a potent industrial safeguard, but it does have disadvantages in that it results in the formation of antagonistic "blocs" both inside and outside the board. "Blocs" never look out for the good of the whole, and the progress of the industry will be measured by the degree of co-operation and not by the strength of the several "blocs." Furthermore, the arbitrary standards fixed by the arbitration boards in many industrial disputes have often been based on false premises and sometimes political expediency, so that today, when recision takes place in all railway expenditures, grave trouble arises because of the previous standards set up for compromising disputes.

Labor in particular formed a "bloc" which fought hard for deserved wage increases when prices advanced and now fights hard to maintain these same war standards. It is more able to fight because the machinery or "bloc" previously organized continues to function and, to make matters worse, in many cases irresponsible leaders have obtained control of the labor "blocs" and fight selfishly for their own interests.

The bright spot in the gloom arises from a consideration of recent decisions of the courts where the "cost of living" as the sole standard for setting the wage standard has been replaced by "financial condition of the company" and the "price of labor in the open market" as more pertinent standards.

If only the "blocs" can be unified and educated to realize that "all for one and one for all" is the true motto for arbitration and that the "all" means the co-ordinated railway industry, then the industrial methods of the past few years will result in progress.

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This has happened in several cases recently in the electric railway industry, and the good results in these cases should serve as examples in other cases.

Railroad Electrification as a Power Plant Proposition

A LARGE part of the discussion regarding the electrification of steam railroads has centered in the motive power department. This is not because the freight and passenger transportation departments are not equally concerned with the matter, but it is because the crux of the whole thing is in the character of the motive power units. The question is, How and when shall electric drive be substituted for the direct mechanical drive now practically universal in railroad service? This question, as framed, implies that the ultimate electrification of railroads is a foregone conclusion unless some greatly superior form of motive power is invented and developed. This is the conclusion of large numbers of men who have studied transportation in a large way.

In order that this discussion may get anywhere with reasonable celerity, the subject must be approached from the standpoint of the railroads. To them the first question is: Will electrification aid us in giving the public the transportation which is demanded, and in giving this at such a profit as to enable us to command the money which we need in our business? If a convincing affirmative answer to this question can be given (and it can), then the next question is: What program will permit the introduction of electric motive power with the least disturbance to operation and financing? The answer to this second question will require the united efforts of the best minds in the business for some time to come. The first step is to become thoroughly familiar with the possibilities of electric motive power, viewed from the power-plant standpoint.

Fundamentally, the railroad has a choice as to prime movers between a large number of portable and traveling power plants, each relatively small in size, and a few stationary plants each large in size. These stationary plants could be owned and operated by the railroads, or the power could be purchased from power-producing companies. Who should produce the power is a matter of detail, not of general principle. Obviously the aim is to deliver it to the locomotives or motor cars with reliability and economy. The power plant is the railroad's prime mover, no matter who owns it or operates it. Everything else being equal, the large stationary power plant is superior. It is superior even to a multitude of small stationary plants, and much more so to automotive ones. What are some of its points of superiority?

First, the big plant does not need to be as large as the sum of the little plants. The "diversity factor" helps out, due to the fact that the power distribution system integrates the total load. In mountain electrifications some trains even become auxiliary power plants while descending grades. Again, the big stationary plant can be built to operate more economically due to its size; to the availability of condensing water for steam or of water power for use in turbines or impulse wheels; to the possibility of arranging the machinery for convenient inspection and maintenance; to the fact that it does not have to haul its fuel supply around, etc. These items of economy are important, particularly from the standpoint of fuel conservation. There is another advantage possessed by the big plant, however, which is of transcending import and which will have more influence on electrification than anything so far mentioned. That is the ability, through the medium of the electric locomotive, to deliver large, in fact almost unlimited, amounts of power at any points desired. This statement will stand some elaboration.

Ability to deliver concentrated power above that possible with automotive power plants means that tonnage trains up to the capacity of the draw bars can be hauled, or that speeds can be increased, or both. Thus track capacity is augmented, crew costs reduced, transportation service improved, etc. If these great results can be had at reasonable cost, then there is but one answer to the electrification question when track capacity has been reached under steam operating conditions.

One element in electrification has been assumed up to this point, namely, the electrical equipment of the locomotive and its electrical connection with the power plant. These are incidental, although obviously essential, to the discussion of the power phase of electrification. On the steam locomotive the engine is connected with the driving wheels by means of a simple and effective mechanism. On an electrified system the connection between the prime mover and the driving wheels is more remote and, of course, more complicated. Is this a serious objection beyond the fact that it is different? There is no valid reason why it should be so considered. The electric motor is as reliable as any steam engine; power transmission and distribution are already highly perfected; electric locomotives in use in fair numbers for many years have demonstrated their reliability. To be sure, the electric locomotive with its power connections is, or seems to be, in competition with a highly developed rival which has the advantage of being self-contained. The competition, however, is really not between two pieces of rolling stock, but rather between two power plants, one large and stationary, the other small and portable.

"Let George Do It" Is Out of Date

THIS paper has continually urged continuous publicity and advertising as a means of promoting good will and of increasing business. The electric railway is one of the greatest industries in the country and almost the poorest advertiser. Fifteen billion sales, yet millions of rides manufactured and not sold! Still some ask, "Why advertise?"

There is one feature about advertising, however, that is little appreciated by most railways, whether they advertise or not. This is that advertising is a profession today with its experts, its own science, its special knowledge, its statistics, etc. It is not something which can be turned over to "George" or any cub-reporter-type "publicity man." The American public, continually bombarded by advertising of all varieties and kinds, is acquiring taste in advertising as it is in its selection of almost any other product. It is a finicky public. The ordinary product is scoffed at. It knows good advertising when it sees it.

This leads to the obvious conclusion that a railway contemplating advertising—and all should do so as regularly as other businesses—will do well to seek professional advertising advice. "Let George do it" is out of date in handling advertising, just as it is in dealing with engineering, transportation and other railway activities.

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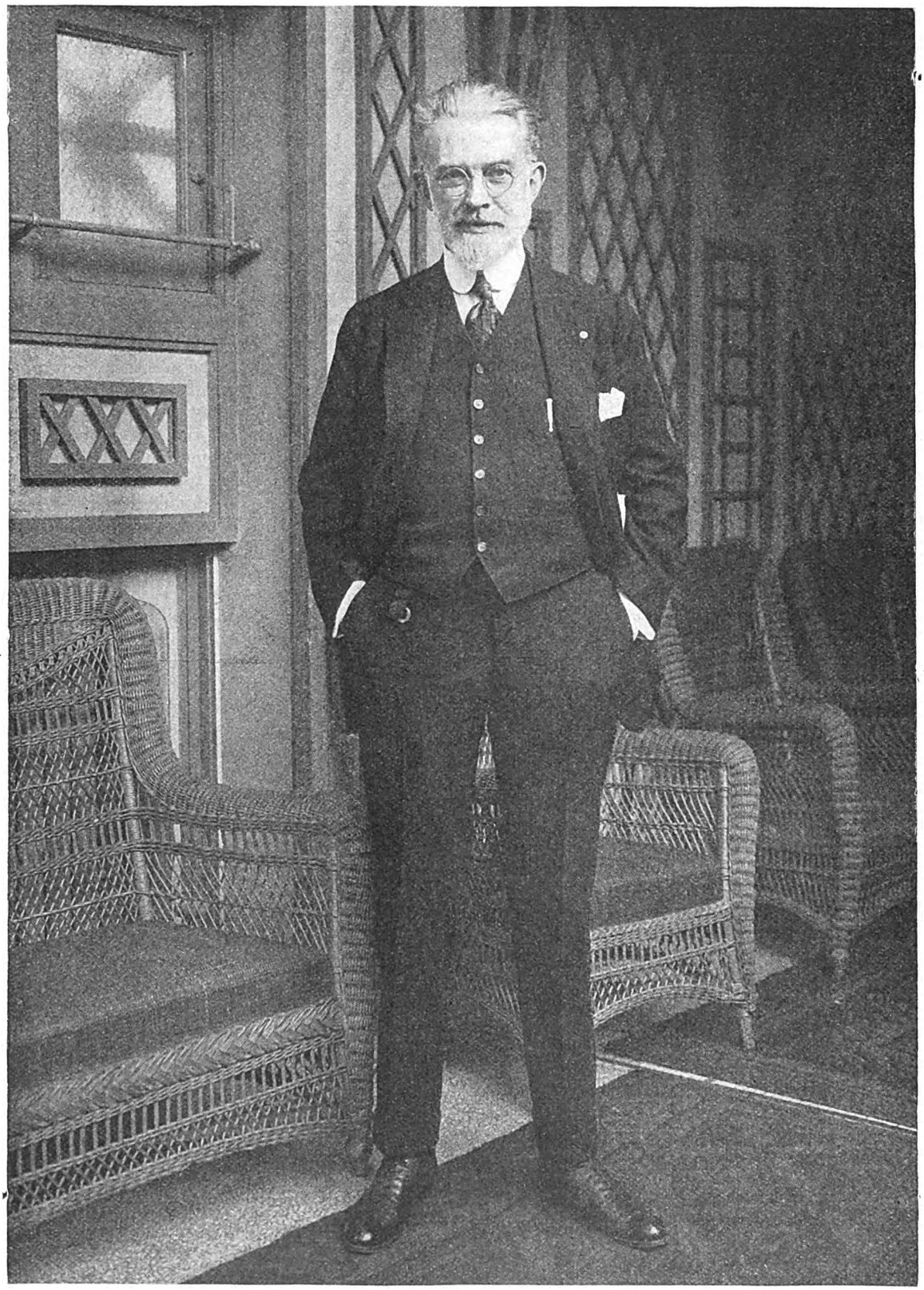

Henry L. Doherty

President Henry L. Doherty & Company, the Cities Service Company

A successful public utility operator, a leader in business thought and practice, who has never lost the human touch and sympathy. In the accompanying interview he has talked intimately of the outlook both in general business and in the railway industry

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Henry L. Doherty says:

Electric Railways Have a Secure Future

Present business conditions forecast good market for substantial securities—Readiness-to-serve and distance tariff charges still to be worked out—These and other problems still unsolved, and men of the industry must go to bottom of them—Transportation labor costs and conditions differ from those of other industries—Publicity must be in language of the man in the street—Immense army of employees should be utilized

An interview with Henry L. Doherty

By Harold V. Bozell

HENRY L. DOHERTY is variously known as a banker, a public utility operator, an exponent of the thrift idea and a leading oil and gas operator, but it is probable that comparatively few people realize him to be fundamentally an engineer in his natural tastes, and in his method of thinking. He is an engineer, too, who bases his engineering on thorough study and knowledge of scientific fundamentals, and he frequently delves night after night into various scientific works, into the basic chemistry and physics, to set himself right with reference to some technical problem in which he is interested.

Mr. Doherty has fortunately carried this habit or persistence of going to bedrock for a foundation for his judgment into the field of public utility operation, of general economics, of banking, and of any other subject with which he deals.

There are some who do not agree with Mr. Doherty's philosophy or with some of his arguments, but such people cannot gainsay his success in the various activities into which he has entered. His independence of thinking, his directness and virility of action are qualities which have placed him where he is today in the public utility, oil and banking fields. There are many who can remember his preachments of twenty and twenty-five years ago with reference to economics and practices of electric lighting and gas companies which are only now beginning to be generally adopted.

In the electric railway field the dramatic movement of the Toledo street cars into Michigan, the climax of his efforts to settle the Toledo strife of twenty-five years duration, is an incident still fresh in our minds. It will also be recalled that this incident was preceded in Toledo by a series of speeches and advertisements, personally directed by Mr. Doherty, which were notable in their broad view of public relations. The time Mr. Doherty spent on this particular situation was greatly out of proportion to its intrinsic value to him as a part of his entire business. This merely indicates his bent toward doing thoroughly anything he undertakes. If he only had more railway properties than he has, he might have taken other opportunities to bring forcibly to public attention some very fundamental railway facts.

It was Mr. Doherty whom I sought out for a discussion which might forecast to some extent the future of the electric railway industry. It was characteristic of him that he immediately started in to talk about that factor which is fundamental to the success of any business, namely, general business conditions.

"I have no hesitation in saying that most people attach entirely too much importance to the depression in foreign trade," he began. "Why does absence of foreign trade hurt us when we have so much yet to do in this country? I think we are sound, and that if we will quit worrying about foreign trade and get to work and do the things which we want to do and ought to do for ourselves we will soon be quieted down and working along normally again. The worst feature of our lack of foreign trade is that, like a scarecrow, it overawes us.

"Take petroleum, for instance. The United States and Mexico produced less than 190,000,000 barrels in 1910 and more than 600,000,000 in 1920. Our foreign trade has never amounted to much more than 15 per cent by volume. In a business growing so fast as to treble itself in ten years it requires but a short time for the growth of business to compensate entirely for a complete absence of foreign trade.

"We must adjust ourselves to foreign trade conditions and not continue to produce some things in excess of the world's market, and turn our available activities into the channels of production which we need and can use. Our building program is at least five years behind and that alone offers opportunity for labor and capital largely to take up our slack. To be sure, in manufactured goods we have produced in many lines too great reserves, but that does not mean we have to export those in order to keep making some more like them, but that we should turn our energies toward the building up of some of those things in which we have fallen behind."

"Where do you think we are on the business cycle—employment and unemployment, security values, general business conditions and production?"

"It looks to me as if March would probably be the low point in unemployment on account of the winter weather closing down some activities and the fact that spring has not yet opened them up. However, I believe that security values should improve. We have had a period of high interest rates, and while the world has never

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had any such condition as it is now experiencing, it has gone through some great economic disturbances, and it is always apparent that after a period of high interest rates we have a period not only of rates lower than the high ones, or normal rates, but actually of subnormal interest rates.

"During the boom period of the late eighties and early nineties interest rates went to abnormally high levels but after our financial and business collapse of '93 interest rates soon commenced to fall, going to subnormal levels and remaining there for several years. The Bank of England's discount rate went down to 2 per cent and remained there for more than two and one-half years, and during that period it was not unusual for commercial paper to be discounted at the rate of 1 per cent per annum or even less. Low interest rates mean inevitably higher market values for investment securities. In my opinion we are bound to have much lower interest rates and unless we have a quick and widespread revival in trade they are bound to drop to subnormal levels."

"For what reasons other than it has happened before are we expecting such low interest rates again?" I asked. "In other words, as you see it, what are the present factors which point so definitely to lower interest rates, and higher security values?"

A Coming Demand for Substantial Securities

"Following such a collapse of business as we have had in this country recently, there is naturally idle capital. During prosperity the investor gets restless. He has always been used to, and satisfied with, rather safe, low-interest-bearing securities. But in boom times he strays into the speculative field. Then, just as soon as he realizes that the element of speculation has gone against him, he immediately hunts security; it is then a question of 'safety first' for him. As a result, there is a demand for safe investment and a search on the part of the investor for substantial securities. This, of course, in the end makes for substantial productive business conditions in the country.

"Another element will be our getting away from the thought that we are wholly dependent on export business for a return to normal business activities. There can be no such thing as a permanent balance of trade against any country. When we in this country were laying the foundation of our present great wealth, our exports were low. During the period when practically all of our railroads were being built we sold low interest bearing bonds abroad that did not show in our balance of trade and yet that was about the best export business that this country ever did. It was that period of internal improvement that contributed most to our present wealth.

"Now we are a wealthy nation—perhaps too wealthy for our own good—and we need improvements badly, new buildings, new extensions of utilities, new extensions of reproductive industry for our own population, and it seems worth while to use our wealth in that way.

"There is another angle to this, and that is that I believe we will have an immigration of the right kind. Conditions abroad are such that the man who has training such as the trained mechanic, the trained farmer, the trained scientific man, etc., will naturally emigrate to this country rather than continue to live under the intolerable conditions of Europe—intolerable compared to those which he experienced while he was obtaining a certain status in his home country. This ought materially to aid the proper building up of American industry —certainly it is more useful than an immigration of the cheaper, uneducated, untrained, foreign common laborers, who come and work for a time and the more thrifty and therefore more desirable class return to their own countries.

"It looks to me as if the United States will be the great tourist country of the world, and that we can set the pace for the world if we are wise. You can put a tack in this statement. More people of the foreign countries want to see America than ever before and many of them will find ways of doing it. They will talk about what is going on in New York as we used to talk about what was going on in London and Paris."

In connection with a survey of the general business conditions, and the supply of money in reproductive securities, I was anxious to know what Mr. Doherty thought of the effect of the present tax law. The tax-exempt security seems to be the monkey wrench in the machinery—at least so far as the supply of money for some uses is concerned—and he gave very definite views on this subject.

Reproductive Industry Hampered by the Tax-Exempt Security

"The excessive income tax coupled with the tax-exempt security has done much to bring about the present business depression. Being an engineer, and not a lawyer, I don't see how any sane man can read the Sixteenth Amendment to the Constitution and say that there are any tax-exempt securities. If you wanted to word a statement to indicate that there were to be no tax-exempt securities I don't see how you could find any clearer language than that which is used there, namely, that Congress will have the power to levy a tax upon income 'from whatever sources derived.' The language of the amendment provides strictly for a tax against income and is not a tax against the bond which is held. It will be a great step forward for the country if the tax-exempt securities not only in the future, but also those now issued, may have their tax-exempt features eliminated.

"The effect, of course, is that capital is encouraged into non-reproductive investments. What I mean by reproductive industry is that when capital goes into that sort of enterprise, the things which are built are factories, and tools, and everything which gives opportunity to men to produce something more and earn their own living thereby as differentiated from buildings and statues, and many other classes of public expenditures which do not form the basis or give the opportunity for use by the people for further production."

It was about here that Jack, the parrot, commenced to give trouble. For we were having this interesting discussion at Mr. Doherty's house, which is near the Wall Street district of New York, and one of his house pets is a green parrot, which says all kinds of timely things, and which just now started to attack one of the palms. However, no amount of persuasion from Mr. Doherty would coax Jack onto his hand, and it was necessary to call the cook, who seems to have a greater control over the recalcitrant parrot, and who was finally able to induce him to stop his destruction of the palm and go to the kitchen for something to eat.

This residence of Mr. Doherty, by the way, is something unique. Several years ago Mr. Doherty tired of his daily ride on the New York subway, or on New York's crowded thoroughfares, and decided to forsake his Riverside Drive apartment and locate within walk-

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ing distance of his Wall Street office. He consequently purchased an old tenement building just south of the famous Curb Market on Broad Street and refitted the second floor for his bachelor apartment. This combination of home and office proved so satisfactory that he has recently finished a permanent residence on the top—the eleventh—floor of the Battery Park Building, opposite Battery Park, at the lower tip of Manhattan Island, and overlooking New York Harbor. Here he has a gymnasium, squash court, billiard room, sleeping porch, bowling alley, and a comfortable residence with those other things which tend to make one healthy and happy, and it is here that he is more often found than at his so-called business office on Wall Street. While able to keep in constant telephone communication from any part of his house to his office, it is at the house that he has his books and surroundings which make it easier for him to work uninterruptedly on his problems. It was across a small table in the combination gymnasium-sun parlor that we were talking, and it was here that Jack was getting intimate with the palms.

"THERE never has been anything to take the place of the public utility. In other industries something else comes along, and substitutes for, or actually supersedes, the industry or the product, and we see a decay of the former industry. But this is not so with the public utility, which is supplying a service of public necessity — certainly of public usefulness — and while improvements may be made in means and methods, the service required does not change."

PUBLIC UTILITY ALWAYS INHERENTLY SOUND

After Jack was quieted, our conversation turned toward public utilities and railways. "There never has been anything inherently wrong with public utilities," said Mr. Doherty. "There never has been anything to take the place of the public utility. In other industries something else comes along, and substitutes for, or actually supersedes, the industry or the product, and we see a decay of the former industry. But this is not so with the public utility, which is supplying a service of public necessity—certainly of public usefulness—and while improvements may be made in means and methods, the service required does not change.

"Our troubles come from lack of conception of the actual situation. Originally, we were regulated on account of the understanding that the public utility is a monopoly, but then the public forgot this recognition of the public utility as a monopoly—at least it forgot to insure to the public utility the right of being a monopoly at the same time it subjected it to the regulation of a monopoly—and, in the case of the electric railway, for example, has subjected it to competition of the jitney. There is, of course, a gradually growing appreciation of the jitney situation, but there is much that the railways can do to impress this upon the public. It is idle to believe that a rubber tired vehicle using gasoline as fuel and an independent power plant in each vehicle can successfully compete with the electric railway.

"I like always to come back to the 'readiness-to-serve' charge, as a basis of impressing some of the fundamental facts of this subject. A readiness-to-serve charge in any public utility is always there whether it is seen and applied or not, and the burden of this readiness-to-serve charge falls upon the regulated utility expected to furnish regular service. In electric railways, as all electric railway men know, cars have to be run whether there are passengers on them or not. In some figuring which I once did on this subject, in trying to find out what the cost of service was with the passenger and without the passenger, I found that our readiness-to-serve charge or cost was from 80 to 85 per cent of our total operating cost, only 20 to 15 per cent of the operating expenses being applied to the actual carrying of passengers. If the jitney was forced to give service to all parts of the city and at all hours and not simply carry passengers when the going is good, the cost would be double or three times as much as for the street railway performing the same service. This is a point which I believe electric railways can stress much more than they have done up to the present. They should indicate to the public the responsibility for being ready to supply service upon demand, which is borne by electric railway companies — by any regulated utility—and that it is something for which the utility must be paid if it is going to continue to bear it. The jitney, on the other hand, does not have any such requirements, and since so large a proportion of the jitney revenue can be expended directly in the cost of carrying passengers, and need not be spent in providing a readiness-to-serve service, most comparisons between the jitney and street car must be taken with plenty of salt.

"There has been something done on this question, but much of what has been done has not been done intelligently. By this I mean that statements of the facts which I have just made have not been put in proper language for the general public in a sufficient number of places for this to have seeped into the public mentality in the way for the public to understand what is to its own best interests. It will be a very useful thing indeed to reiterate such things as this in the language of the man on the street, and reiterate it so often that he will be bound finally to understand what we are driving at.

THE FOLLY OF THE FLAT FARE

"There is another mistake which I think railway men have made since the early days of the electric railway industry, and that is the attempt to carry a man any distance for a flat fare. I think the same mistake was made in the electric lighting industry, but that industry soon broke away from the practice, whereas the electric railway is still hampered by the custom—and as a matter of fact, the community itself is hampered in its best development by such a plan. The idea seems to be that the public should get what it wants and the public thinks it wants a flat fare for a given community, but here again is an opportunity for education in the interests of the community.

"I think it is the best thing for the community as a whole to have a distance tariff scheme. We don't have enough railway properties ourselves to make it worth our while to develop such a system, but I think the railway industry is bound to come to it in some form or other in the future. But in addition to this being a subject upon which the public should be educated, it is also one for the men of the industry to study and decide

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themselves. There are troubles inside the industry such as this and the reason for some of them is that a good many of the electric railway men have never gone to the bottom of things to find the right economic and business solution. It is only now, after twenty or twenty-five years of experience, that gas companies have found that they must come to 'a readiness-to-serve charge,' for example.

"How can this be applied on railways? That is a natural question and I don't know the answer that will work out best. Perhaps in some way it should be levied on the riders or on the city as a whole. It might be a tax on property on account of the more or less equalized value of the readiness to serve to the whole community, for certainly the community as a whole is benefited. It is difficult to tell where to lay the readiness-to-serve charge and how to apportion it, but in some way it should be worked out and this might prove the easiest solution of our street railway problem. Let's assume that you as an individual have your residence 3 or 4 miles from the center of the city. Even if you depend upon an automobile for your own use you are still dependent upon the street railway to maintain your residence. Your help must come and go on the street railway. Many of your supplies reach you that way. What do you think you could afford to pay in the way of an annual charge rather than to have the street railway abandoned?"

"Do you see any likelihood of its early solution?"

"I don't know—I sometimes get discouraged trying to get decisions or common action by business men. A good many of our troubles I think we can trace to ourselves as business men. As individuals we all have our own fad notions and it is a mighty difficult thing to get business men to agree on any one thing and go down the line together in common action. We need more real thinking business leaders in our business life.

Business Leaders Lack Team Work

"I don't know whether I ought to say it or not, but it seems to me that a good many business men are 'accidents.' In other words, a good many men at the head of large business interests are there not because they created them themselves, but because by some accident or other they came to be the heads of businesses created by others. This is nothing particularly against the men who are at the heads of those businesses because they are probably the best men in the organizations to come to the head, but they are not the creators, the original thinkers which it would be best for the country to have at the helm. This is one reason, I think, for it being difficult to get business men in many cases to agree upon certain fundamentals of common action.

"The electric railway industry is no particular exception and here, too, we find it difficult to get agreement and common action on some of the important and really fundamental problems of the industry."

"Well, Mr. Doherty, what do you really think of the future of the electric railway industry? How about buses? How about the security of investment and opportunities for future expansion, etc.?"

"I have always been considered a pessimist on street railways, but now I probably would be considered an optimist, though as a matter of fact, as I see it, my view has not changed a bit. I am very hopeful. I look to the future of every electric railway in a big city as being a successful electric railway—a successful business with every reason for feeling secure in its position as a permanent, legitimate enterprise. Costs are coming down, which will help the railways some, and there is really a better understanding of the railway problem.

Labor Conditions and Costs

"There are also very much better labor conditions in the electric railway industry than before. But this does not help the cost of producing transportation very much, for no matter how the labor conditions are improved, costs are not improved as they are in many other lines. This is somewhat different from the situation in most other industries, for every time that labor conditions improve in any manufacturing industry it means that the cost of production goes down in much greater ratio than the reduction of wages. Production per man increases. In the case of electric railways, on the contrary, better labor conditions mean better operating conditions, probably more revenue on account of better public relations, and things of that sort, but the costs are not reduced, for better labor conditions are not accompanied by greater production, as we have the same number of men per car whether they are surly and dissatisfied or pleasant and satisfied.

"I am in favor of as high wages as it is possible for the railways to pay, as I think it tends toward good labor conditions, satisfactory and secure relations with the community. As to what I think of labor unions, I think principally that the abuse of power which we have seen in several instances has been principally an abuse of power by the men who became leaders rather than any desire on the part of the men themselves.

"I may repeat, but I cannot emphasize too often, that I think the whole problem of electric railways is a matter of education of the public. Through such education, or on account of such education, we can sell our securities. But we cannot be subjected to unfair competition. If the competitor, the jitney, is to be allowed to run only when and where it pleases then the restrictions requiring readiness-to-serve service of the railway should be removed and it should be allowed to run only when men want to come in crowds, and when they want to come singly they would find no cars to carry them. Possibly a little education of this sort might be good in more places than it has already been tried.

"I think our electric railway problems of the future can be summed up in two words: Fares and jitneys. I think the proper fare is a matter of education and I don't think it matters much how high the fare is—that is, on what level of fares we operate. I do want continually to hold in mind, however, that I favor a distance tariff with as low a basic fare as possible."

"Don't you think there is any upper limit in the fare? Can we keep on going up and still give the service to the community in providing a means which people can afford for transportation?"

"I think it's a question of analyzing each city. Take New York, for example. I have not studied the situation and have no fare scheme to recommend for New York City, but assume that the fare were 15 cents from 100th Street to Wall Street on the subway, do you think there would be any riding loss. Every one would have to come to work and after getting used to the new charge would probably make no more fuss about it than they do about increased prices of everything else. Why should any one be shocked at slight increases in fares when other things went up the way they did?

"What we need is to put this matter in such a clear

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way that people can comprehend. And in discussing this question of how to word publicity matter and how to reach the people, I was impressed from the results of our war intelligence tests in learning about how much of our population is really just above the feeble-minded state. This means that we must use language and examples that people are used to. We must talk the people's language—the language of the people who are going to read what we write. I have seen publicity matter—advertisements and car cards, etc.—which couldn't convince me—or any of my associates who happened to be along with me—and how under the sun stuff like that is going to convince those who know absolutely nothing about the business I can't see.

"We must show the folly of duplication of service—must show how much duplication of service there was before regulation set in and how, in the interest of the community, it must not now be allowed to grow up again and hamper development of the best transportation service."

> "THERE is a clamor for the public to have a share in the profits of railways, but I think we must realize and the public be made to realize that service at a low price is a dividend to the public. It is a dividend of real and tangible value and the public will some day realize this if it does not now."

ADVERTISING AND PUBLICITY DEPEND ON THE "COPY"

"What do you think of advertising by railways?"

"I have had a lot of people write me and ask me whether or not they should put on publicity campaigns. In answer to every question of that sort I reply 'show me the copy and I'll answer.' I think it is absolutely always a question of what the advertisement says. In some of them there is more bad than good accomplished. In some cases any old ad smith is given the job of writing advertisements without a real understanding of the problem. Consequently it is not well done—it frequently looks extravagant and more often than not the writer is too far away from the reader. This does not mean to detract from the excellent work which has been done in this line, but if what I can say will assist in building up constructive information to the public, I shall be glad.

"But an advertisement is not so effective as the creation of centers of information and of centers of spreading this information by word of mouth and by general education of newspaper editorial writers, etc. I remember not long ago a question of pressing and great interest to the oil industry. Some of us wrote a real long article—twenty pages or so—which was conclusive, clear and understandable and was sent to newspaper editors marked 'not for publication but for editorial consideration.' This did the job. Newspaper editors were glad to get authoritative information and were convinced that they should stand for the proposition as a matter of principle in the best interests of the community.

"I think ultimately we will have the public gain a full realization of the folly of anything but a perpetual—that is, indefinite—franchise. It is impossible to give an artificial death date to any legitimate business enterprise, and to try to do so merely limits the possible service to the public. This all electric railway men know, but it must be put in a language either of our own or of others who realize it, which the public will and can understand."

"Speaking of franchises, do you see in the service-at-cost franchise a permanent solution of the problem?"

"Service at cost is merely one way of reaching an agreement with the public. There are naturally all sorts of contracts, some with better features than others, and it is sometimes most expedient in a given community to adopt the service at cost principle and in other communities some other principle of agreement between the railways and the public. The service at cost is not yet perfect in that there must be some division of profit or some other reward for meritorious operation. In other words, while service at cost has many advantages I think that it is still subject to improvement in the interests of the best public service."

It seemed worth while to have Mr. Doherty's thinking with reference to the distance tariff scheme of charging, for his ideas and work in connection with rates for gas and electric service are well known to those who have associated with him in those fields.

"As I said before, I haven't any scheme worked out but I have thought of some principles which in some way or other it seems to me ought to be applied. Parts of them have been applied some places in the world but never, at least in this country, to any degree of satisfaction. How about having an odometer on the car, for example, and as each passenger gets aboard have him have his ticket stamped with the mileage at which he boarded the car and have him pay as he left in proportion to the mileage which he had traveled as shown by some large odometer at the dismounting end of the car? I don't want anybody to understand that I am suggesting exactly this thing as a means of doing it, but it is a principle which I think will some day be worked out in the electric railway industry. There will probably be some initial charge plus a distance tariff and there is bound to be some similar collection scheme which will put the principle into operation.

"It seems to me—in fact, I thought of trying it one time—that you might sell transportation by the yard, like a roll of tape, and no one would have to deposit cash but would make his purchases monthly or whenever he ran out of transportation tape. For each ride he would deliver a length of tape proportionate to the length of his ride. Occasional passengers would pay a high cash fare. This is another idea, impracticable as here stated, but which may be and probably will some day be the basis of charge. It is in a way similar to the mileage book on the trunk-line roads.

THE DISTANCE FARE IS AN AID TO SOCIETY

"My fundamental principle is that there should be some distance system of charging for riding. Most people do not know what the effect is. People in the United States herd together now, and it seems to me that the distance tariff scheme would tend to make people separate—it would tend to do away with this herding together of people of like nationalities and tastes—principally immigrants—in other words, it would help the melting pot which we call America.

"Some people say it would tend toward congestion, but it is my belief that it would do exactly the opposite. It has been found in foreign cities that the distance tariff scheme tends to make the average ride shorter. Each man in place of riding several miles, rides only a

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short distance and this requires less equipment. I think this is the reason for showing less investment or fixed charges on some of the foreign transportation systems and I think it is not well understood in this country.

"This question of fare adjustment is especially important just now, for prices are being adjusted in every industry and the present offers the best chance the railways have ever had to get away from the flat fare and start a real measured service method of charging. It will be done some day, and every day it is put off is a day lost. It will need study to find the best way, but it should be done. The principle is right."

Taking up some of the other problems of the railways, Mr. Doherty expressed his strong approval of customer ownership of securities and urged more of it.

"We must make and emphasize the statement that there is no real competitor of the electric railway. It provides the service which no other agency has been able to provide in any acceptable manner. We must educate the public to an understanding that as car riders they should not pay for paving between the tracks and for cleaning streets. We can also do a great deal to eliminate the use of the private automobile for the individual man's travel to and from his office.

"There is another thing in the railway business which is little appreciated and that is that there is such a thing known as load factor. I think a great deal can be done toward increasing the load factor—smoothing out the load curve—of the electric railways and I think we have not even made a beginning toward staggering of hours in the general interests of the community's transportation requirements.

"There is a clamor for the public to have a share in the profits of railways, but I think we must realize and the public be made to realize that service at a low price is a dividend to the public. It is a dividend of real and tangible value and the public will some day realize this if it does not now. As to what is a low price—I think any price which has so far been named as a price is low. If the leaders of the industry will realize this situation and if they will impress this conception upon the public I certainly have no fear for any money which is invested in the industry.

Railway Employees Must Be Made More Active

"But again it is a question of education. We have over a hundred million people and a large part of these are users of the electric railways. They can't think right if we don't think right ourselves. There is the vast body of employees who ought to be working continually to spread this information, but how much use of these employees has been made—how much has been accomplished or done through them? I know that employees get awfully tired of listening to their own executives and superintendents talking to them about the problem. There is no reason why I, if I had more railway properties and had the time to do it, shouldn't start out and call meetings in various places and talk about the problem. The officers of individual railways cannot keep doing it to their men, but outsiders should be brought in. I think this is something which should be encouraged more and more in the industry—many more talks by the right kind of men in the right kind of language, operating through the employees to the public.

"There are few companies which have done anything and there are very few which have done much. One of the reasons is that the executives themselves have not been educated to the desirability—the necessity—of doing this and then there is the problem of educating the employee after the executive is sold on the proposition."

When he was told of the activities of the association in response to the suggestion of Mr. Wickwire that the employees of companies manufacturing supplies for electric railways be used in this general education campaign, Mr. Doherty voiced his hearty approval of the plan and said it was right in line with the things he was thinking about as being useful and necessary.

And as to the bus— "We've had enough of the jitney in Toledo and I think it is true that there isn't any place for the jitney in the city transportation field. However, in non-railway territory, I think that the bus has a place and that it should be used by the railways in connection with their transportation system. I don't know much about it, but as a business proposition it seems to me that it is only natural to use the bus in light traffic supplemental territory."

But again Mr. Doherty came back to the question of the use of the employee in public education.

"Collectively, the industry ought to make up a program for employee activity with the public. This should be carefully worked over and put into operation for every electric railway in the country. It is one of the greatest latent forces which the industry has at its command to stabilize itself quickly and on the right basis with the public.

"As I said before, I am an optimist on the future of the railway and in discussing the problems before us I have merely tried to forecast, as you have requested, some of the developments which I think will take place in the industry for its good and for the good of the communities in which the various railways operate.

The Power of the Business Press

"And by the way, you in the trade or business press should be doing more than you are doing to help in this general situation, not only of railways but of all industries. The business press is a powerful agency, and particularly the technical press is a factor and can become a much greater factor in the solution of the business and industrial problems of the country. I think you have the same difficulties in the various units of the technical press that I have related as existing among business men in general—namely, the difficulty of operating together on a problem upon which you are all agreed or can easily agree.

"But I do want to emphasize that the technical press at the present time reaches practically all of the key men of the United States—by key men I mean any man who bosses a group of other men, whether they are five or ten or 1,000 men. If he is in that position he has a higher grade of intelligence than the rest of them and has an influence on their thinking, and if leaders of men from bosses of five to the most influential executives in the country can be reached through the business and technical press you have a power and an opportunity to accomplish things for the good of general industry, and therefore for the nation itself, which is immeasurable.

"I am appreciative of the opportunity of talking through the technical press on railway problems, even though my own activities are not very much in the railway line, for I think it is one of the vital industries of the country and that upon its success and continuous service to the various communities depends in a large measure the business success of those communities as well as the satisfactory development of community social activities and of housing and living conditions."

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T. & T. Problems to Be Solved

Six Committees Actively Engaged in Studying Live Transportation Topics—Present Time Most Propitious for Betterment of Service and Merchandising This Transportation —Ways Pointed Out by Which This Can Be Done

BY L. H. PALMER
President American Electric Railway Transportation & Traffic Association

ALMOST essential characteristic of the mental equipment of a successful man in any line of endeavor is the ability to visualize all sides of a subject, to be able, as it were, to look around, above and below the problem under consideration. That ability, I believe, is particularly essential in the handling of public problems, those that affect the comfort, prosperity and well-being of the citizens of a section or a community. If this premise is correct it applies with especial force to that large body of the public utility fraternity engaged in the operation of electric railways. At the request of the editors of the ELECTRIC RAILWAY JOURNAL I will outline some of the plans which the American Electric Railway Transportation & Traffic Association has for carrying out this work during the coming year.

MERCHANDISING TRANSPORTATION REPORT WILL BE AN OUTSTANDING ONE

Many of us, too many, I believe, are not taking up, in a whole-hearted way, the great problem of making our services conform to the desires as well as the actual needs of our patrons. The merchandising of transportation committee of the American Electric Railway Transportation & Traffic Association is entering on the third year of its work. Many excellent suggestions have been made and many data have been prepared for use by our member companies in the two reports already issued. Further ideas on the subject have come out in the discussions at conventions, in meetings and in the technical press. Now, I ask, are we getting the full benefits available from this work? No. Hence my reiteration of the statement with the hope of emphasizing its great importance.

The trouble with many of us in approaching this all-important matter of merchandising transportation is the lack of mental flexibility. A combination of the well-known "Let George do it" attitude mixed with a generous portion of "stand-patism" (when this insidious combination is compounded and a dose taken) does not get merchandising transportation any further on a property than the famous celluloid canine got in pursuit of the asbestos cat in Hades. The committee on this subject for the present association year has sufficient vital work laid out for its accomplishment so that next October, as at the last convention, its report will be one of the outstanding ones.

Meanwhile, during the year the Bureau of Information and Service at association headquarters will keep the subject before our membership by bulletins, articles and compilations. Moreover, this bureau will be glad to be of service in a specific way to any company which is developing this method on its property.

The more a person studies this subject, the more he will find that it enters (or should enter) into the consideration of all the important problems that he must study and solve; hence the necessity for the ability to comprehend all phases of the subject. Somewhere in every electric railway problem will be found a side affecting the public and the merchandising of our product to the public; hence the need, in electric railway men, for that foresight and judgment which recognizes adequately the public side of our business and keeps that side to the front, so that it will receive full weight in arriving at decisions. If I have made myself clear, it will be understood why this subject, in my judgment, has been given first place in the work of the Transportation & Traffic Association this year. I should like to make it so plain that on every property some active attention would be given to the question.

SAFETY WORK CREATES PUBLIC CONFIDENCE

Public confidence is the greatest asset any railway can possess. It cannot be measured or expressed in figures, like the outstanding securities of a corporation, but it influences very largely their actual as well as their quoted values. It is one of those powerful though silent factors that measure the real success of a company and its executives. Merchandising, honest and frank publicity, courtesy and fair dealing, both with the public and with employees, and constant watchfulness to meet the needs and reasonable desires of the car rider must be practiced to obtain public confidence.

One of the important means by which public confidence can be gained and thereby the position of the corporation strengthened in the community is the intelligent use of safety methods. Moreover, when the safety movement is intelligently conducted, it will more than pay for itself in a reduction in accidents and damages, thus not only reducing expenses but, what is infinitely more important, conserving life and property.

Safety instructions to employees go hand and glove with merchandising instructions, and these two topics form a fine team for gaining public co-operation, which is a step toward public confidence. Moreover, as other men have emphasized time and again, and as was explained in the last report of the safety committee, safety work establishes a basis of confidence and respect between employer and employee which is of great value in the upbuilding and retaining of proper co-operative relations between the officers of the company and the men whose activities they direct. We all know the injurious effects on the service rendered of a high turnover of employees, and largely to the extent that the turnover is reduced do we improve the quality of our product and increase the number of satisfied patrons of the road.

Even a casual study of the report of last year's safety committee will indicate the great possibility for further application of this movement to the activities of the average street railway company. Just as was emphasized at the last convention, the responsible executive in charge of operations must not only be a sales manager, but he must be an apostle of safety. It is the same old story that has been so often pictured by word and by

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cartoon, that what the president or general manager thinks guides the attitude and actions of the men on the cars, who are our direct representatives with the public. It is this underlying principle that I would like to re-emphasize, because of its vital importance in the effective management of our properties.

Both merchandising and safety, to be effective, must be impressed into the conscious actions of the platform employees and the supervisory force of the transportation department—that is, the personnel in direct charge of handling the public. Personnel is a comparatively new word in our vocabulary, but it has had great vogue since the beginning of the war. To my mind it means more than merely wage earners or employees, and somehow conveys the thought of an intelligent group of men, all of whom are working toward the common good of their organization.

Time Not Wasted in Building Esprit de Corps

I am a great believer in frank dealing with the employees of the company and feel that the more intelligent the understanding of our problems and situation is on the part of employees, the more effectively can we explain our difficulties to and obtain the co-operation of our patrons. Yearly we are coming to realize more than ever the possibilities of using our men, who come in direct contact with the public, as a means of reaching the public. The motormen and conductors are our actual salesmen, and largely in their hands, through their courteous and intelligent treatment of their patrons, rests the final impression that the public has of the street railway company. This conclusion cannot be denied, and therefore, it seems to me, that the utmost efforts are justifiable in making these men salesmen of good will and confidence.

I feel that it is hardly possible for a far-sighted executive or operator to spend too much time in building up the esprit de corps and the intelligent understanding of the company's problems and position among all employees. When such work is carried on and proper contact is not only established but maintained with the employees, the misunderstandings between the management and its men will be eliminated. I am satisfied that this is not an idle phrase or a mere platitude. With several companies in the country just such efforts are being made and are bearing fruit, and it is one of the promising features of present-day operation that such is the case.

A real start has already been made and lines of progress have been outlined that point the way for further development of co-operation between the owners and operating officers on the one hand and the men whose work they direct on the other. With these good beginnings as a guide, much greater advancement can be forecast. A study on the ground of some of the companies which are doing this intelligent work of co-operation would well repay the executive officer of any company, irrespective of whether, in his judgment, conditions are such that he can adopt the policy or not. Any steps that can be taken to increase the interest and loyalty of the men to the organization in which they earn their living will tend to improve the quality of service rendered the public. Thus one of the problems which face the management of all our companies is to promote this sense of loyalty and to foster it, by making the conditions under which the men have to do their work as satisfactory and attractive as possible.

In the years that we have just passed through it was right and necessary that wages be increased substantially. Now, however, during the period of downward readjustment to a condition of continuous normal business, the whole country is facing reductions in wages and salaries. No one likes to accept a decrease in the money that he has been earning, but any man will take it with better grace when he understands the basic conditions which force the reduction. The companies which are taking their employees into their confidence and letting them understand the difficulties of the present-day situation are, I believe, able to make cuts in compensation paid, with less difficulty and without impairing the cordial relations existing with their operating force. Where this has been done, it speaks volumes for the methods of the company and furnishes added proof of the beneficial results that accrue from co-operative plans.

One important advantage that people working for a street railway have over those in many other lines of business is permanence of employment. The truth of this has been illustrated since the let-down from the feverish activities caused by the war. Even with diminishing earnings the street railway companies have gone along retaining most of their employees, keeping their service moving and so providing continuous employment, whereas many other kinds of industry have been almost completely shut down. This advantage has been thoroughly emphasized as the result of the experience of the last twelve or eighteen months, and it has increased the spirit of contentment with their work on the part of the men fortunate enough to be employed in the electric railway business.

I cannot but feel that the influence of this development is going to persist for a long time and that it will mean a better class of men seeking work with us, a reduction in turnover and an increase in the interest that the men take in their work. I view it as one of the favorable by-products of the war period which is reacting in our favor.

Desire for Standardization Must Not Clog the Wheels of Progress

In the recent past much has been said and written concerning the safety features of one-man car operation, and it is unquestionably true that the development of the safety devices has been one of the principal factors in making the operation of one-man cars satisfactory to the public and the public authorities. Here in Baltimore we have had something to say concerning the faulty design of the original standard car. As the result of experiments made in a number of other locations, as well as here, we determined when purchasing our second lot of one-man cars to depart somewhat radically from the designs recommended by the car builders and in general use heretofore. Several months operation with these cars of modified design, *i.e.*, wider aisles and separate exits and entrances, has so justified our original contention that recently we have made another substantial purchase of these cars of the newer type.

I believe that the advocates of the standard car unfortunately have clung too persistently and unyieldingly to their old design. It is another example of the "stand-pat" tendencies that so frequently clog the wheels of progress. One of the difficulties of standardization, as we all know, is to crush the spirit of initiative. Any one who observes this newer model in service, as compared with the older type, will be struck with the much

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better facilities offered the public. In other words, the question of safety of passengers still being adequately cared for, the new car "merchandises" transportation much more efficiently and satisfactorily to our patrons.

Under such conditions there is absolute justification for departure from the old standard, and I hope for the benefit of the industry, in its desire to handle the car rider most satisfactorily, that before others purchase cars of the so-called standard type, they will come to Baltimore and give us an opportunity to show what we believe is a conclusive demonstration of the improvements over the earlier type of one-man cars. I feel this newer design is better, not only for larger cities, but for the smaller towns. This is one of the topics to which the one-man car committee of the Transportation & Traffic Association is to give further consideration in its report for the convention next October.

The Railway Company Should Supply All the Transportation Needed

A basic theory of public utility regulation is that light and heat companies and electric railways are natural monoplies, besides being quasi-public concerns, and that therefore some measure of public control must be imposed upon them. This principle was quite generally accepted and went along upon what might be called a normal course until the appearance of the motor bus, particularly the jitney, "spilled the beans." Due largely to political rather than to economic conditions, the situation developed in such ways that the "natural monopoly" theory received some bad dents and got more or less scratched. The much regulated and highly respectable (shall I say satisfied?) street railway operator looked upon the jitney as a pest and a nuisance. He refused to consider it as a forerunner of a development that might hold great possibilities for service to the community, and generally and frequently got himself into such a "stand-pat" condition that he refused to admit that there was any good at all in trackless transportation vehicles. Gradually, however, the situation has been clarifying, and we have come to realize that the most efficient railway utility is that which provides all of the transportation needed by the community it serves, whether it is on rails, underground, surface or elevated, or on rubber tires.

I know of no reason why the electric railway operator cannot run motor buses or trackless trolleys at least as efficiently as any other man in his community, and certainly he ought to be able to do it better. Further, I am firmly convinced that the best interests of cities demand that the whole transportation furnished the communities should be in the hands of one responsible agency, to which the people can look and on which they can depend, for the character of service to which they are entitled.

Many claims which cannot be substantiated are being made and scattered broadcast, to the effect that motor buses are going to supplant the trolley car, whereas those who have studied the problem of mass transportation know that it is not a case of *supplant* but a case of *supplement*.

We should be alive to and abreast of this rapidly developing situation and should see to it that the company which each of us represents is taking such forward steps as will preserve to it the function of furnishing complete transportation. We must be studying the problem so as to know what the best kind of transportation is for the various districts that each of us serves.

There is an active committee on trackless transportation of the American Association, with co-operating committees from both the Engineering and Transportation & Traffic Associations, and during the year they expect to make progress in their study of this broad problem.

I consider it impossible to place too much emphasis upon the premise that the street railway company should furnish all the transportation needed for its community, and that it matters little whether this is on rails or on rubber tires.

We need to be in the forefront of this movement for the following among other reasons:

1. To give the people we serve what they need and want, and
2. To protect our investments and interests.

But it is the first idea that I wish to stress again. It includes the phrase "merchandising transportation" in its broader sense, and it will mean much for the industry as a whole, if we will adopt this constructive, far-sighted and forward-looking attitude in dealing with the so-called vexed question of trackless transportation.

There Exists a Nationwide Need for Traffic Regulation

There is one other committee of the Transportation & Traffic Association that has performed a notable service to the industry during the past three years, and I would like to mention its work briefly, before closing this discussion. The subject is that of traffic regulation. With the increasing use of the highways by self-propelled vehicles, and particularly the interstate movement of these vehicles, a real need has arisen for the co-ordination of rules, signals, signs and general regulations for the guidance of automobile drivers. With the co-operation of a number of other national associations, including that of the traffic officers, a forward step has been accomplished in the development of the standard code for the regulation of traffic. Study is now being made to determine the possibility of having uniform signals, signs and general regulations adopted for the country as a whole, and it is most desirable to attain this object. Our committee has had a part in the constructive work so far accomplished, and it is prepared to assist in the further steps that should be taken in the near future.

The Field for Constructive Work Is Enormous

Viewing the field of our work as a whole, I am impressed with the possibilities for constructive work that lie just ahead of us. The developments that affect our business are of great extent and require constant study and watchful attention, in order to diagnose them and apply the most effective methods of increasing our usefulness.

I believe it augurs well for the future of our industry, and with it the work of our association, that we are continuing to meet and study the problems as they arise, looking to their successful solution in order to be prepared to take up those that succeed. The horizon is constantly enlarging, and since the trials of the last few years have been successfully overcome, we realize our industry has a bright future and it rests with us to assure its consummation.

One of the potent instrumentalities for the task that I have outlined in this article is the American Electric Railway Association and its affiliated bodies.

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The Engineering Association and Its Plans

Internal Problems Are to Be Taken Up by a Committee on Reorganization—Other Committee Activities and Problems Are Outlined—Participation Is Urged in All National Standardization Movements

BY C. S. KIMBALL
President American Electric Railway Engineering Association

ONE of the most important acts of the president of an affiliated association is the appointment at the beginning of the association year of members of the different committees of the association. The executive committee decides on the number and assignments of the committees, and members of the executive committee often advise as to the make-up of the working committees for the year. Nevertheless the responsibility is on the president, and it is an important one because the work of the association for the year depends largely on this selection. This responsibility is placed upon the president at the beginning of his term of office and must be completed within a comparatively short time so as to permit the committees actively to begin their work as soon as they can.

This year, before any members of committees of the American Electric Railway Engineering Association were appointed, the writer, with Mr. Welsh, made a careful canvass of all possible committee members, thought being given not only to experience in the subject matter to be taken up by the committee but also to the question of geographical distribution so as to have representation from all parts of the country so far as possible, consistent with chances of good attendance at committee meetings. The question of appointment was then taken up with each individual member.

CHANCES IN COMMITTEE AND OTHER ASSOCIATION WORK

From one standpoint, the committees of the Engineering Association might be criticised, namely, from that of size. Of the eight committees so far appointed, one has a membership of seventeen, one of sixteen, one of fifteen, two of fourteen, one of twelve, one of eight and one (that of purchases and stores) of seven members. It is true that a committee of sixteen or seventeen is a large committee and might be considered by some to be rather unwieldy but there are reasons in the Engineering Association for large main committees. One of these is that it is the practice to have on each main committee a number of small committees to take up individual assignments of the work, and these working sub-committees in which most of the detail work is done are small. Another reason is that in committees of the Engineering Association, more than in any other, the representatives of manufacturing companies are particularly appropriate because of their expert knowledge in regard to engineering matters. Hence, on each of the committees of the Engineering Association, except on the committees on purchases and stores and on uniformity of car design, there is a considerable number of manufacturing representatives. As it always has been the policy to put on each such committee an equal or greater number of railway men, the committee becomes unavoidably rather large.

An important departure in the practice of appointing committees adopted this year has been in the appointment on each committee of a sponsor from among the members of the executive committee. It should be understood that this sponsor acts as an adviser only to the committee, and his appointment does not relieve the chairman of the committee of any of his responsibility for the work of the body. Nevertheless, four notable advantages are gained by the appointment of these sponsors. The first is that it changes the work of the executive committee member from one of being largely in a consulting capacity to one of active participation in the work of the year. In the second place, it enables the executive committee as a whole to keep very closely in touch with the progress of the committees so that it knows exactly if a committee is getting along as well as should be expected. In the third place, it gives the committee the benefit of expert advice, because many of the members of the executive committee thus acting as sponsors have in the past been chairmen of committees. Finally, as the sponsor is supposed always to be in attendance at the committee meeting, there is automatically present some one to take charge of affairs in case the chairman and vice-chairman are away. Thus, greater latitude is allowed for the appointment of a chairman residing some distance away from New York.

One or two committees are to be appointed in addition to those whose names are scheduled on page 960 of the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 26. One of these is a committee on trackless transportation to work in connection with a similar committee to be appointed by the T. & T. Association. Another committee to be appointed is that on reorganization. The purpose of this committee will be to study the existing form of organization and methods of work of the Engineering Association and its relation to the American Electric Railway Association, to see whether there are any improvements that can be made to promote efficiency. The appointment of such a committee naturally follows the suggestions made by Mr. Gove in his presidential address last October. By resolution of the executive committee, the committee on reorganization will consist of five, to be made up of members of the executive committee and past-presidents of the association.

Action on two of the points made by Mr. Gove have already been taken by the writer. One of these was to determine whether there might not be at the association headquarters in New York an engineering assistant to Mr. Welsh. There is much that such an engineer could do besides work directly connected with the Engineering Association. Much of the information required by the membership of the association as a whole is of an engineering nature, or of the nature of engineering statistics. The great benefits to the association as a whole of having at its disposal and in its employ a first-class engineer capable of tabulating statistics of this kind were shown in a striking manner at the time of the hearings of the Federal Electric Railways Commission.

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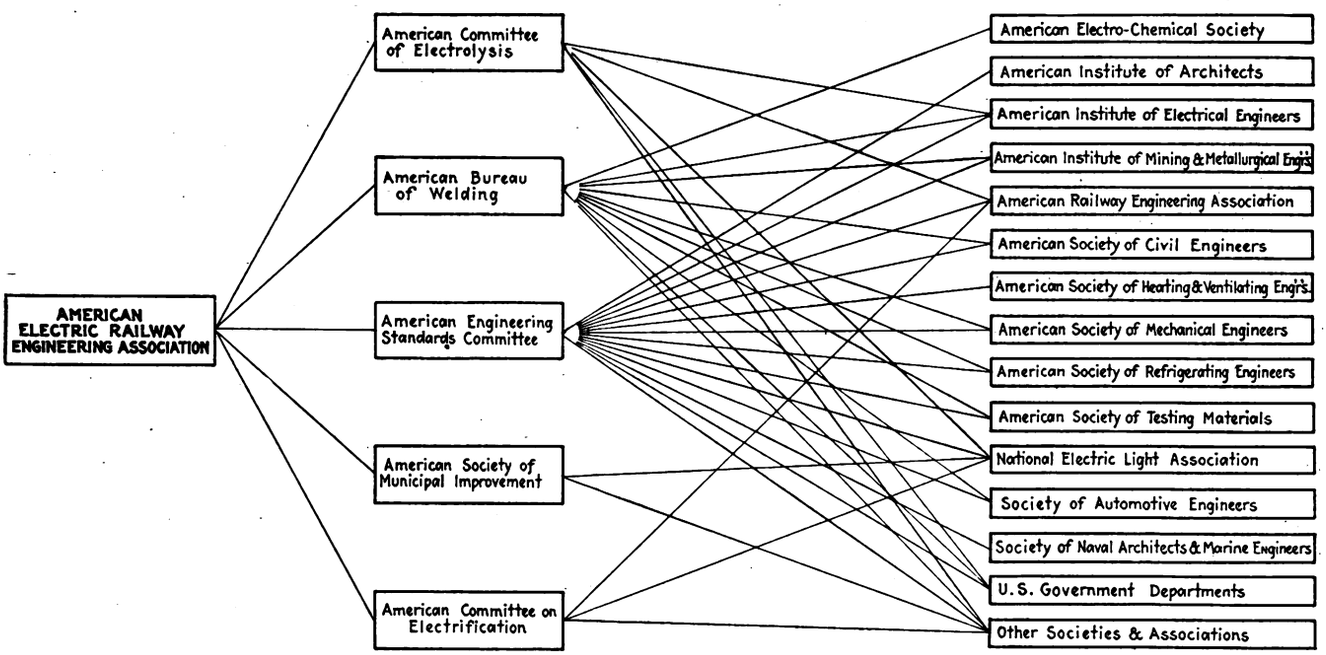
Here, Mr. Welsh, then engineer of the association, was able to compile and present to the commission statistics which were invaluable in proving the position taken by the electric railways. The other duties now required as secretary of Mr. Welsh make it impossible as a practical matter for him to carry on all or a greater part of this engineering work, except to act in a supervisory way. This is the basis for the desire of the Engineering Association that an engineering assistant to Mr. Welsh should be appointed at the New York headquarters. Such a man could also assist in making up data sheets and tabulating the statistics obtained from them, and in this and other research work which he would do he could often compile advance data for companies needing information on special topics before the final results of an investigation were actually completed and published by the association or by the committee engaged on this special problem. This assistant could also take care of the detailed engineering correspondence at association headquarters and help in many other ways.

Another suggestion made by Mr. Gove in his presidential address last October was that the traveling expenses of committee members in attendance at the committee meetings should be paid by the association where the member company with which that committee member is associated declines or is unable to pay these expenses. It was hoped, by means of such an arrangement, that committee membership would cease in some cases to mean a serious tax on the individual purse of the committee member, and thereby the association would be able to command the services of the best men for committee members. Of course the committee work to which such a condition applies consists not only of the work of technical committees but as well any other work done for the association such as choosing a convention location or representing the association at a meeting of a national committee.

If such a plan was adopted it might be coupled with a proviso that such expenses payable by the association should be limited to railroad transportation. This whole question has been presented to the American Association and has been referred to the finance committee of that association.

A problem was encountered in connection with the heavy electric traction committee of former years. As there are now few steam railroads with electrified sections which are members of the association, only a limited number of employees of an electrified steam railroad are available for appointment on the heavy electric traction committee. If the American Electric Railway Engineering Association is to continue its important work along heavy traction lines, some change in the constitution is necessary. One suggestion made has been to establish a special class of individual membership to consist of employees of electrified steam roads at dues probably somewhat higher than that of individual membership for employees of member companies. Another suggestion is that these individual members might be admitted as consulting engineers. It is hoped that this matter will be decided soon because activities should be started promptly on the work of the committee on heavy electric traction.



THROUGH PARTICIPATION WITH VARIOUS NATIONAL ENGINEERING ORGANIZATIONS THE AMERICAN ELECTRIC RAILWAY ENGINEERING ASSOCIATION IS ASSISTING IN THE ESTABLISHMENT OF NUMEROUS NATIONAL STANDARDS*

One complaint which has been made in regard to the work of the committees of the Engineering Association in the past has been that too large a program has been assigned to them by the executive committee. It is impossible always for the executive committee to know in advance the extent of the work which a committee can do, but to avoid overloading the committee the chairmen now have permission to report on such subjects in their assignment as they think they can satisfactorily cover, and are empowered to refer to following committees all subjects in their assignments which they have neither the time nor opportunity to investigate.

Developments during the past few years, especially during the past year, have made the standardization

*The "American Committee on Electrification" has not yet actually been formed. For this reason, in the diagram the committee is shown in relation specifically only to the steam railroad and electric light associations, although, of course, as suggested in the article, many others will be asked to co-operate.

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work of the Engineering Association of vastly more importance than ever before. Heretofore, the standardization done by the association has been confined principally to the approval or disapproval by the standards committee of the standards which have been recommended for adoption as such by other committees of the Engineering Association. Recently, however, there has been a widespread movement through the entire country toward the creation of national engineering standards through co-operation with and under the direction of the American Engineering Standards Committee. This is largely the outcome of the standardization brought about in this country, as well as abroad, during the exigencies of the war to increase output. It is now realized by industrial leaders as an equally potent factor toward national prosperity in peace.

Engineering Association Is Co-operating in Establishing National Standards

The American Engineering Standards Committee is made up of representatives appointed by the leading engineering associations in this country and other organizations aggregating about 150 in number, and the American Electric Railway Engineering Association, as a national engineering association representing an important industry, has been asked to take part in this work. This it is glad to do. In fact, some members of the engineering association have expressed themselves strongly that it is not only the privilege and the right of the Engineering Association actively to take part in the deliberation of such standards but it is also its duty so to co-operate. Otherwise there is always a possibility that without intending such a result the decision of a group of men not entirely connected with electric railway engineering, or subjects in which the electric railway is concerned, may either result in the omission of important requirements or the inclusion of requirements which may prove adverse to electric railways. The representative of the Engineering Association on the American Engineering Standards Committee at present is Martin Schreiber.

In addition to Mr. Schreiber as representative on the main committee, the American Electric Railway Engineering Association has representatives on sectional committees of the American Engineering Standards Committee developing standards for pipe flanges and fittings, lightning protection, ratings of electrical machinery, wires and cables, and terminal markings. This work is rapidly assuming large proportions and some means of co-ordinating this work and keeping the various standing committees of the Engineering Association advised as to its progress is necessary. For instance, the sectional committee on wires and cables is providing for a technical committee to assist in its work. The various standing committees of the Engineering Association directly interested can and should have representatives on the technical committee and so be kept informed of the progress of the work and offer suggestions for important requirements. Some such organization of other committees may be found desirable.

Another national engineering committee on which electric railway interests may be represented during this coming year is the American Committee on Electrolysis, and the Engineering Association has been asked to appoint three representatives on the research subcommittee of this national committee. This request was made as the result of an invitation addressed by the Electrolysis Committee to the American Electric Railway Association that the association should make a study of the cost of systems designed to minimize railway rail drop, and that it take the sponsorship for this study, working in co-operation with the research subcommittee of the American Committee on Electrolysis.

Still another national engineering movement in which electric railway interests are prepared to participate is a proposed American Committee on Electrification. The plan is that the American Railway Engineering Association, the American Railway Association—Mechanical Section, the National Electric Light Association, the American Institute of Electrical Engineers, the Association of Railway Electrical Engineers, the American Electric Railway Association, and such other organizations as might be willing to co-operate, shall appoint each two members to form an American Committee on Electrification. The purpose of this committee is to co-ordinate the activities of these several associations in collecting data regarding heavy electric traction and in other ways promote the study of this subject.

A chart is presented to show in a graphic way the points of contact between the Engineering Association and the other national associations through this joint work.

Standardization of Ties, Wire and Overhead Crossings

Another example of the united action of national organization standardization is the standardizing of railroad ties. A very interesting conference was held in Washington on Oct. 25 by the American Engineering Standards Committee, and sponsors were appointed to investigate this subject. Our association is a member of the sectional committee. The industry is vitally interested in this subject, and undoubtedly great good will result in a uniform standard for railroad ties.

Still another question which has arisen is that of the conductivity standard for aluminum. This matter is now in the hands of the American Engineering Standards Committee, and our association will have representation thereon. The tentative conductivity standards for aluminum are as follows:

Part I

(a) *General:* The following shall be taken as normal values for standard aluminum:

(b) *Resistance:* At a temperature of 20 deg. C. the resistance of a wire standard aluminum, one meter in length and of a uniform section of one square millimeter, is 0.02826 ohm.

(c) *Density:* At a temperature of 20 deg. C. the density of standard aluminum is 2.70 grams per cubic centimeter.

(d) *Temperature Coefficient of Resistance:* At a temperature of 20 deg. C. the "constant mass" temperature coefficient of resistance of standard aluminum measured between two potential points rigidly fixed to the wire is 0.0039 per degree centigrade.

(e) *Resistance of Standard Aluminum at 20 Deg. C.:* As a consequence it follows from (a) and (b) that at a temperature of 20 deg. C. the resistance of a wire of standard aluminum of uniform section one meter in length and weighing one gram is 0.0763 ohm.

Part II

The conductivity of all metals shall be expressed as a percentage of that of the annealed copper standard.

Another example of united action in the direction of national standardization is in connection with standard construction at overhead crossings, *i.e.*, the provision for electric light and power wires at steam railroad crossings. In this case also the participation of the Engineering Association has been requested.

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How Trainmen's Working Conditions Affect Railway Operation

Major Provisions of Labor Agreements as to Platform Work on Twenty-four Large Railway Properties Are Summarized and Tabulated for Comparison—Information Valuable in Study of Present Contracts with View to Elimination of Extravagant Requirements and Wasteful Practices in Future

BY "EXECUTIVE"

RESTRICTIONS in the working conditions imposed by labor unions, or awarded in arbitrations, have a very important influence on both the cost and quality of service given by a street railway. This thought was greatly emphasized by a recent inquiry which developed the fact that some companies pay as high as 18 per cent of their total platform expense for non-revenue time. While the day has passed for companies to impose any real hardships on their platform men and few managements would go back to old conditions of pay and work, yet it is obvious that such excessive non-revenue labor cost as cited is indicative of unreasonable working limitations.

The conditions now in existence perhaps represent the extreme in things favorable to the trainmen and it is to be expected that in negotiating new arrangements the companies will establish conditions less extravagant. Some of the more alert managements have already done this. With circumstances favoring its hand, labor has made the most of its turn and has carried both wages and working conditions to unprecedented extremes. But now there is opportunity for managements to secure more reasonable terms—terms more in keeping with the peculiar requirements of the transportation business. For while certain of the ideals of unionism may be practicable and good for other industries, they impose what in reality is unwarranted waste when applied to the transportation business. Men in the public service, and particularly in the transportation business, cannot expect to derive the same measure of convenience in their labors as in many private industries, for the inherent nature of the business involves some circumstances which have to be met even though undesirable. These things, within reason, must be accepted as a part of the job, without expecting such concessions as cannot help but incur excessive operating costs, consequent higher fares and a lowering of the measure of service to the public. The unpleasant parts of railway employment, however, are possibly more than offset by the steady and healthful nature of the work and by other minor advantages.

In an effort to study out ways and means of fairly eliminating wasteful practices as imposed by present labor agreements, one of the most important steps is to find out what conditions now prevail with other companies. Accordingly, an analysis of the major contract requirements, or the practice followed where the company does not contract with its men, has been made for twenty-four of the larger electric railway companies and is presented herewith in tabular form for convenient study and comparison. For obvious reasons the companies covered are not named, but are indicated by letter. A study of the table will disclose that some companies are burdened only in certain conditions, while others have costly requirements under practically all features of the agreement. Much of the information presented was obtained only as the result of a questionnaire calling for definite answers, as a study of the contracts does not give a clear understanding of the working conditions, partly because of the difference in the terminology used.

Of course in comparing the working conditions on different properties, due allowance must be made for variations in such local conditions as length of route, running time, variation and intensity of street traffic throughout the day and night, and number of cars operated in the rush and non-rush periods. Nevertheless, the information presented herewith may be very helpful, and if it does no more than to inspire a checking up on present contract limitations, it will have filled its mission.

Street railway work, above all other kinds of employment, is one in which the quantity of the product manufactured must at all times meet the demand and no more. Insufficient service at one hour cannot be made up at another hour, and an excess of service at any time is a dead waste. So the traveling habits of the public, which is the guide in schedule building, must be closely and continuously followed. In thus adjusting service, if the requirements of a contract with trainmen make it impossible to serve the public demand without too great a penalty in the way of bonus allowances, a heavy burden is thereby placed on the cost of operation, and the public as well as the company must suffer.

ELECTRIC RAILWAYS AND THE EIGHT-HOUR DAY

Take, for instance, the provision for a straight eight-hour day for 60 per cent of the runs on one large property. This was forced by a compromise following a strike several years ago. It is understood that 2,000 additional platform men had to be employed by the company to put this into effect. The great majority of people, of course, ride in the few rush hours of the morning and evening, and these peaks are so separated that a straight eight-hour run cannot serve both. The result of the straight eight-hour provision, then, is the necessity to employ more men, with a consequent substantial increase in the cost for the same amount of service. Only a very few companies have submitted to an eight-hour basic day, as it is impossible to adapt the street railway business to that basis without introducing what seem to be extravagant though unavoidable platform costs. Of the twenty-four sets of conditions analyzed here, only two companies have an eight-hour day, but only one of these has strictly a straight eight-hour day; four are on a nine-hour basis, five have a definitely prescribed maximum above nine hours, and

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Tabular Portrayal of Working Conditions in Effect on Twenty-four of the Large Electric Railways in the United States

Company	Maximum and Minimum Hours	Extra Rate for Overtime	Limit of Spread of Hours	Straight Runs	Reporting and Turning in Time	Meal Reliefs and Fall Backs	Terminal Time	Company
A	10½ hr. max.; 9 hr. min.; 6 hr. min. for extras.	1½ time for work in addition to regular runs with min. of 1½ hr.	44% of runs must be within 14½ hr.	56% of runs must be completed in 10 hr. on week days.	No allowance.	No allowance.	6¾%; try not to exceed 8%.	A
B	10-hr. max. for regulars; 6 hr. min. and no max. for swings; 1 hr. min. for trippers; $40 a mo. min. for extra men.	1½ time week days for time in addition to all regular runs; 1½ time Sundays and holidays for over 8 hr. or over regular runs.	Swings after 13 hr. get bonus of 15 min. 1st. hr., same for 2nd hr. and 30 min. each hr. thereafter.	None on week days.	10 min. for first report only.	No allowance.	4% long runs; nothing short runs.	B
C	8 hr. max. and 8 hr. min. for regular and extra men.	Time and one-half after 8 hr.	Must have 40% of runs completed within 14 hr.	60% of runs must be straight.	10 min. for first report; 10 min. for second report; 7 min. for turning in.	Average of 25 min. for fall back, or not over 30 min. for meal relief.	10%.	C
D	As near 10-hr. day as possible; 6 hr. min. for any run including trippers, but required to work any run or trip and may be required to do additional work within 13 consecutive hr.	1½ time week days after regular run; 1½ time Sundays and holidays after regular run.	All but swings within 13 hr.	15.7% straight; no limit on per cent of runs over 2 pieces.	5 min. for first report; 5 min. turning in.	No allowance.	4 min. on all runs; about 10%.	D
E	As near 9 hr. as possible for day runs; 8½ hr. or more constitute late run; no guaranteed min. except $100 a mo. for extra men.	None.	No limit.	No limit.	Conductors allowed 5 min. turning in.	13 min. drop back.	5 min. on all round trips.	E
F	None fixed; regular runs over 8 hr.; $110 a mo. min. for extra men.	None.	60% in 13 hr.; 20% in 14 hr.; 15% in 15 hr.; 5% in 16 hr.	No contract; only stub runs are straight; no limit on over 2-piece runs.	5 min. first report; 5 min. second report; 5 min. turning in.	No allowance.	3 min. each end of each trip.	F
G	None fixed.	1½ time for work in addition to regular runs.	70% of "straight" in 13 hr.; 90% of swings in 15 hr.	No guaranty; no limit on number of runs over two pieces.	10 min. first report; 10 min. second report 5 min. turning in.	No allowance.	2 min. each end.	G
H	None fixed.	1½ time for "platform time" after 12 hr.	Pays bonus for spread over 14 hr. as follows: ½ the excess over 14 to 15 hr. spread; 15 min. plus ½ the excess over 15 to 16 hr. spread; 45 min. plus ¾ the excess over 16 hr. spread and up.	No agreement, but 57.7% are straight	5 min. for second report; 10 min. turning in	15 min. for dinner; 20 min. for supper.	11%; min. of 5 min. at home barn and 1 to 2 min. at other end.	H
I	No max. fixed; 9-hr. min. guaranteed; extra runs guaranteed $2.19.	1½ time for excess over 9 hr. after 10 hr. work.	50% in 11 hr.; 40% in 12 to 13 hr.; 10% in 14 hr.	None.	7½ min. first report; 7½ min. turning in.	No allowance.	Not over 4 min.	I
J	No max. fixed; regulars guaranteed 8 hr.; extras guaranteed 5 hr.	1½ time for spread over 11 hr. for earlies and lates; 1½ time after 14 hr. spread for swings; 1½ time after 8½ hr. on holidays but not on Sundays.	75% in 12½ hr. and swings in 15 hr.	No "one piece" runs.	No allowance.	No allowance.	5% to 7%.	J
K	No max. fixed; min. 9 hr. for regulars, $4.30 a day for extras.	10c. per hr. after finishing schedule runs.	40% of regular runs in 11 hr., 20% in 12 hr., 40% in 13½ hr.; extras have no limit; 15½ hr. is max. involved.	35% straight is the practice.	10 min. first report; 10 min. turning in.	No allowance.	5% to 10%.	K
L	None fixed; $2 a day min. guaranteed for extras.	None.	60% of regulars not exceeding 11 hr.; 30% not over 14 hr.	No contract; practice about 50% straight; no limit on over 2-piece runs.	10 min. first report.	No allowance.	1 to 3 min. with layover at only one end and 2 to 4 min. for 2 ends.	L
M	No max. guaranteed; min. of 8 hr. for all, including extras who report.	1½ time for work in addition to regular runs.	60% within 11 hr.; 30% within 14 hr.	None required to be straight; 7% are over 2 pieces; 30 min. or less between pieces are paid for.	Motormen, 5 min. first report, 5 min. turning in; Conductors 5 min. first report, 10 min. turning in.	No allowance.	10% to 20%.	M
N	9-hr. max.; 8 hr. min. for regulars; 6½ hr. min. for extras.	1½ time after completing schedule, which may be over 9 hr.	Early regulars, 11 hr.; lates 12 hr.; extras 13½ hr.	None; regular runs are two-piece; extra runs may have three pieces.	Same as next above.	No allowance.	.....	N
O	8 to 9½ hr. max.; 8 hr. min. for regulars.	Not stated.	11 to 15 hr.; 80% in 12 hr.; no regular runs over 14 hr.; 20% excess time first hr. and 35% thereafter is added for regulars after 12 hr. spread; extras get 25% excess time for first hour and 45% thereafter after 14-hr. spread.	No straight runs, but 80% within 12 hr.	No allowance.	For man relieved less than 1 hr. company pays up to 60c. for meal.	.....	O
P	No max.; min. of 8 hr. for regulars; actual time for extras.	None.	After 14 hr. spread, extra men get extra ½ hr. 1st hr., ½ hr. for second hr., ¼ hr. for third hour and double time thereafter.	39% straight; 46% two-pieces; 15% extras.	No allowance.	20 min. paid on eaoh run for meal-time.	10½% of total time.	P

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Q							
Q	As near 9 hr. as possible; no guarantee as to min. but pay min. of 8 hr. week days, 6 hr. Sundays; extra men actual time.	1½ time for work in addition to regular runs and for short trippers; also ½-hr. extra for spread over 14 hr. to 15 hr., ¾ hr. over 14 to 16 hr., 1½ hr. extra for over 14 hr. to 17 hr.	99.96% in 15 hr.; 100% in 16 hr.	Week days 15%; Saturdays 63%; Sundays 99% straight.	No allowance.	12 min.	6% to 7% of running time; short runs 2 min., long runs 6 min.
R	10 hr. max., 9 hr. min. for regulars; 2 hr. min. for extras.	1½ time for regulars after regular run; straight time for extras.	10 hr. for straight runs; no limit for extras.	All runs straight; no limit on other than two-piece runs operated as trippers.	5 min. first report.	No mention.	10% of running time; allow 5 min. on long runs and 2 min. on short.
S	No max.; no guaranteed min.; trippers working over 5 hr. get 9 hr.	1½ time for schedule, but straight time for additional work.	11 to 15 hr.; 74% in 12 hr.; 18% in 13 hr.; 8% in 14 hr.	No limit.	No allowance.	No allowance.	.....
T	No max.; no guaranteed min.; regular runs average 9½ hr.; extra men making all regular reports get min. of $100 a month.	None.	Try to keep within 15 hr.	Regular runs are straight; no limit on runs over two pieces.	Motormen 10 min. first report; conductors 10 min. first report and 15 min. turning in.	No allowance.	7% incl. 1 min. for reporting; 4% not incl. the 1 min.; 2 min. on 1- or 2-end lines.
U	No max.; min. of 9 hr. for regulars, 6 hr. for extras.	1½ time for work over schedule; owl runs 8 hr., pay 9 hr.	60% in 12 hr.; 40% have no limit.	No straight runs except on night cars.	5 min. first report; 5 min. second report; none for turning in.	No allowance.	2 min. each end.
V	No max.; min. of 6 hr. for regulars, $20 a week for extras; all runs over 6 hr. and under 9 hr. must be paid at maximum rate.	1½ time for work over schedule; unscheduled passenger service pays 1½ time over 9 hr.	50% in 10 hr.; 20% in 11 hr.; 20% in 12 hr., 10% in 13 hr.	50% of regular runs are straight.	Motormen get 5 min. for turning in.	No allowance.	7.47%.
W	9 hr. max. with leeway of ½ hr. to complete schedule; guarantee of 9 hr. min. to regulars and 6 hr. to extras; extras called Sundays get min. of 5 hr.	Extra men 1½ time for work after 10 hr. Sundays and holidays.	60% of regular runs in 11 hr.; no regular to exceed 14 hr.; extra men not on scheduled runs get 10c. per hr. bonus after 13 hr.	No mention in contract.	No allowance.	No mention.	.....
X	8 hr. max. week days, 6 hr. Sundays; min. of 8 hr. for regulars and 5 hr. for extras.	1½ time for work over regular run.	35% in 9 hr.; 45% in 12½ hr.; 20% in 14 hr.	Week days 35% straight; Sundays, 70%.	7½ min. first report; 7½ min. turning in.	No allowance.	.....

the remainder, thirteen, have no fixed limit. A good indication of the practical inability to carry out the straight eight-hour day in the transportation business without unduly high costs is found in the recent decision of the Railroad Labor Board, which, while indorsing the eight-hour basic day, ordered that extra pay for overtime shall not begin until after ten hours work.

As to the attitude of individual trainmen on the eight-hour maximum day, it is frequently the case that where they have a choice between a short and a long run, they choose the latter, and where the straight eight-hour day enabled an employee to complete his work early, he often sought other work so as to add to his daily earnings. From the humanitarian standpoint there can be no argument against protecting the workman from unreasonable working conditions, but if the men are really seeking a shorter workday with higher pay so that they may take on other jobs the camouflage should be removed.

MANAGEMENT HANDICAPPED BY SHORTENED WORKING DAY

Consider also the effect of an eight- or nine-hour minimum day which prevails on many properties. A few years ago an emergency demand for service could be met by sending out additional runs for a few hours, morning and evening, or at any time of day. Now, such runs would have to be paid the guaranteed minimum, thus raising another item of cost out of all proportion to the possible additional revenue. This makes the manager hesitate to furnish the needed service, especially in these days when every dollar has to be counted more carefully. The minimum pay requirement is commonly existent, especially for regular men, and there is good basis for some minimum provision from the standpoint of the men on the extra list. It would seem, however, that a minimum of eight hours or more works a severe hardship on a management in trying to meet fluctuations of traffic, and puts the new man on a pay basis which leaves little in the way of advancement for him when finally given a regular run. Or, looking at it the other way around, the old, experienced, proved man gets little more compensation than the newcomer whose services are usually costly to the company during his first six months or more. Up to the advent of the War Labor Board, in 1918, five years or more were required to reach the maximum rate of wage, so that there was a reward to the steady, experienced men. But the board set all this aside and the maximum rate of pay is now quite generally reached in one year. While the union principle is for equal pay regardless of efficiency or worth, it is fundamentally wrong and this should be borne in mind in negotiating the minimum day provision.

In studying this matter of maximum and minimum hours for trainmen, the other important factors of overtime allowance, per cent of straightened swing runs required and the spread allowance must be kept in mind. The maximum workday is not a real hardship on a company in the building of schedules if it can be stretched slightly without penalty. It becomes an important item, however, when the penalty is fixed at time and one-half or even time and one-quarter for time worked immediately over the maximum stipulated. Of course, the shorter the maximum day the more difficult it is to handle the schedules without much overtime or excessive bonus time, and the more severe the overtime penalty becomes. Similarly, a swing run is little better than a

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straight run if the spread allowance is not sufficiently liberal to permit covering two peaks of a day's service with one crew.

Another costly item is the allowance for reporting and turning-in time. One company allows a total of twenty-seven minutes for this purpose. Some companies make no allowance, while others appear to take care of the necessities by a total concession of ten or fifteen minutes.

The matter of "meal reliefs" on one property amounts to an average of twenty-five minutes per man per day with pay. This is not allowed by most of the companies. It has a decided disadvantage aside from the cost of the time not worked, because persons waiting for cars get a bad impression of the diligence of the management if they see cars waiting at terminals for a long period while the men are eating.

The same criticism applies to excessive layover time at the end of a trip, which, with close headway, keeps a group of several cars at the end of the line. Not only does this give the impression of wasteful management to the layman, but the "jockeying" around of the cars often leaves the patrons in doubt as to which is the first car to leave and thus produces a source of annoyance and ill feeling. Layover time is not a contract matter with any company as far as is known. It has been developed on the basis of experience and the demands of the men, and varies with the length of route, congestion, number of railroad crossings, etc. Its purpose is to provide time for turning cars and for the comfort of the men, and for making up unusual delays. Thus, while there is justification for a certain amount of leeway here, it is costly and should be kept to a minimum. When it is seen from the column "Terminal Time" in the accompanying table that there is a variation of from 4 to 11 per cent in this item with different companies, there is basis for directing serious thought to a reduction in this division of the non-revenue time.

In regard to the item of "traveling time," the practice of all companies seems to be to pay for the actual time between the car station and the point of relief. Some saving on this item could possibly be made by sending in the "defect card" by the relieving crew, permitting the turn-in to be made at the next reporting to the station, and allowing the crew to proceed directly to or from the point of relief or starting work. In connection with the work of instructing student trainmen, most companies give the instructors some extra pay, the average being 25 cents a day. A few companies have a provision for a minimum pay for the students. Most companies also pay extra for snow removal work, usually in the form of meal tickets.

Practices on Twenty-four Railways

The time allowed for making out accident reports varies from no allowance to actual time, or from a flat rate of twelve minutes to sixty minutes or from a flat sum of 10 cents to 20 cents. The average is about fifteen minutes for both motorman and conductor. A study made by one large company showed that the average time consumed in making out reports during one month was 40.6 minutes for the crew or 20.3 minutes per man.

In the matter of pay for night car work, of the twenty-four companies covered in this study, one pays 2 cents an hour higher than the day rate, two pay a bonus of two hours on an eight-hour run, one pays a bonus of one hour on an eight-hour run, one pays a bonus of one and one-half hours on a nine-hour run and the others pay no extra rate.

As to the time paid for between pieces of runs, nine companies make no allowance, four pay for the time up to sixty minutes gap, three pay for the time up to thirty minutes, two up to forty-five minutes and one up to fifteen minutes. The practice of the other seven is not known.

All of the items mentioned in the foregoing must be considered in conjunction. A manager might easily be led into an impossible situation by accepting conditions which, apparently innocent in themselves, become a real hardship when combined. Another point to bear in mind is that the policy of the Amalgamated Association has evidently been to force certain working conditions on one property so that this could be held up as a model feature for other agreements as they were renewed. Hence any laxness or weakness on the part of one company may affect many other companies. In the order of their importance for one large property, the principal items involving expenditures for non-revenue time are: (1) Terminal or layover time; (2) meal relief or fall-back; (3) reporting time; (4) bonus for over maximum or under minimum day and (5) turning-in time. This indicates the degree of effort that should be devoted to each in working for better economy.

Improved Working Conditions Prevail

On both union and open shop railways there has been a great and largely permanent improvement in both wages and working conditions for the trainmen. That this is realized by the workers is indicated by the following taken from a recent editorial from the *Union Leader*.

"We have seen the old dog treatment of men give way to a respectful, reasonable attitude. Men are no longer required to forego time for meals. Payment of damages for accident or breakage is unknown. Men may go where they please to buy uniforms and the days of buying brooms, stamping transfers, carrying excessive baggage, working on footboards, facing the storms without protection, or standing long periods until varicose veins rendered them almost helpless and shortened their lives are over with. We have experienced a complete transformation in operating methods and equipment."

Labor must do its share in the process of readjustment that is now going over the country. The employees on certain properties have shown a fine spirit and understanding of the changing conditions by voluntary acceptance of wage reductions, even despite unexpired contracts to the contrary. These employees and their executives are to be congratulated. Only short-sighted leaders will insist that high wages be maintained until cost of living reaches the pre-war level, because this level will never be approached if one of the important items of production costs is not reduced. Unemployment has reached formidable proportions throughout the country and wages, of course, must be influenced by the old law of supply and demand. New forces could be recruited from the idle millions at greatly reduced cost, and it is only by sensible compromise that those who are fortunate enough to have jobs can retain them. Fair concessions on the part of labor coupled with diligence and skill on the part of the managements should enable the electric railway industry to meet the new business conditions satisfactorily.

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British Electric Railway Prospects

FROM OUR LONDON NEWS REPRESENTATIVE

The status and outlook for British electric railways, as outlined by Mr. McCallum, may be summarized as follows:

Railway electrification is greatly needed and the roads are ready with plans, but work is being held up by high interest rates. Some rapid transit improvements are under way. Tramways will do little new construction till prices fall. New routes are being operated by buses. Some reductions in tramway fares are being made. Negotiations are being conducted with labor to reduce the weekly guarantee.

IN AN article by the present writer which was published in the ELECTRIC RAILWAY JOURNAL of Jan. 1, 1921, an outline was given of what has been done in the past in the way of converting steam railways in England to electric traction and there was appended an indication of the existing schemes for further electrification. Since that time no further work of the kind has been put in hand, though the conversion of the London & North Western Railway suburban lines has been brought nearer completion. The condition of the financial world, the high rate of interest required to be paid for additional capital, the enormous cost of labor and materials (an aftermath of the war), the uncertainty of the future position of the railway companies after the removal of government control in August last, and latterly the amalgamation provisions of the railways act, which was passed last summer, are all reasons for the companies holding their hands in relation to new works of any kind. At the present time no improvement has come about in the rate of interest on loans, but the cost of labor and materials has begun to come down. The uncertainty of the position of the railway companies after the removal of state control has to a certain extent been lessened because the amount of compensation payable to the companies under agreements with the government has been fixed by the railways act, and so have a number of other things. The financial arrangements which will be necessary under the grouping or amalgamations provided for by the same act cannot, however, be definitely settled for some time. Practically all the railway companies in Great Britain except the London local railways are to be merged into four great groups or amalgamations. In most cases therefore these individual companies, for this among other reasons, hesitate to undertake large new capital expenditure until the consolidations and adjustments of existing capital are carried out. This process will take a considerable time. The companies are allowed (Section 2 of the railways act) till Jan. 1, 1923, to submit amalgamation schemes to the Minister of Transport, and after that the schemes have to go before an Amalgamation Tribunal set up for the purpose of considering them and coming to final decisions.

COMMITTEE'S REPORT WAS A STEP IN ADVANCE

A preliminary step, but still one in the direction of advance, was marked by the issue in the end of August last of the final report by an advisory committee of the Ministry of Transport on the electrification of steam railways. The committee, which consisted entirely of railway and electrical experts was appointed in March, 1920, to consider and report whether any regulations should be made for the purpose of insuring that the future electrification of railways should be carried out to the best advantage in regard to the interchange of electric locomotives and rolling stock, and whether any regulations should be made to limit the development of potential in uninsulated return conductors. The committee answered the last point in the negative, and in regard to the rest submitted a number of recommendations for standardized construction as to conductor rails, overhead wire conductors, etc., and recommended direct current traction at a pressure of 1,500 volts as standard. Various necessary exceptions and variations were specified. An abstract of the report was published in the ELECTRIC RAILWAY JOURNAL of Nov. 5, 1921.

This at all events cleared the way for developments on a uniform plan, so as to secure inter-running. The difficulty of making mutual arrangements will also be lessened by the amalgamations before referred to. As to the issue of regulations, this would probably not have been necessary inasmuch as the proposed standards emanated from railway experts and engineers. In any case, however, it so happened that the period of government control of the railways (which began with the beginning of the war) came to an end just about the time that the committee's report was issued. Since then the Minister of Transport has less power to regulate railways. There is, however, a provision in the railways act of last year which still gives some power to the minister in the matter. Section 16 says that the minister may by order require or authorize any railway company to conform gradually to measures of general standardization of ways, plant and equipment, including methods of electrical operation, type, frequency and pressure of current. It is tolerably plain that on this matter of standardization no serious difficulties are likely to arise.

GOVERNMENT GUARANTEE OF CAPITAL

The public discussion of the extension of electrification was stimulated in November last by the passing of the trade facilities act. This is one of a series of acts rushed through Parliament in October for the purpose of reducing unemployment, now so rife. The part of the trade facilities act which has a bearing on railway electrification is the first section which states that if the Treasury, after consultation with an advisory committee (nominated for the purpose), is satisfied that the proceeds of any loan proposed to be raised are to be applied toward the carrying out of any capital undertaking, and that the application of the loan is calculated to promote employment in the United Kingdom, the Treasury may guarantee the payment of the interest and

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principal or of either interest or principal on the loan. It is also provided that the aggregate amount of the loans to be guaranteed is not to exceed £25,000,000. There is no power to make advances or grants. The object in view is, of course, to enable companies, local authorities and others to obtain a lower interest rate.

It was stated by the government when the act was before Parliament that the electrification of railways would come within its scope. Soon afterward several English railway companies which have had conversion to electric traction in view for some years allowed particulars of their schemes to be published. Some of these were new to the public, while others were already well known. At the time of writing the two schemes which appear most immediate are those of the London, Brighton & South Coast Railway and the London underground electric railways extensions. The latter will be dealt with later. Meantime, it may be said that if applications were made for guarantees by all the railway companies which contemplate electrification the sum of £25,000,000 would be wholly inadequate. This is apart from the fact that all sorts of other schemes unconnected with railways are eligible for guarantee. The advisory committee, which is composed of financial experts, has received a very large number of applications, and much examination and weeding out will be required.

The Electrification Schemes Given in Detail

The proposals which have been made public, but for only a few of which (so far as is known) have applications for guarantee been made, may be briefly indicated. The main reasons for the proposals are that they would increase the capacity of congested railways, reduce the time of running and produce economical operation. The London, Brighton & South Coast Railway, which already works some of its suburban lines electrically on the single-phase high-tension system, possesses Parliamentary powers to electrify the remainder of its undertaking, including the main line to Brighton. Work on some of the suburban lines was stopped by the war, and the work is expected to be finished during 1922. When the whole scheme is carried out more than 100 miles of route will be electrified. A handsome return on the additional capital is estimated. The railway company has just given official notice of its intention to promote a bill in the coming session of parliament to authorize it "for the general purposes of its undertaking (including equipment of its railways for electrical traction)" to raise additional capital by mortgages or debentures. It is also learned that toward the end of the past year the company made an application under the trade facilities act for a government guarantee on the loan proposed to be raised for the purpose of electrification. All the plans are ready, so that the company could go ahead at once. The single-phase system will be used throughout, the company having been specially exempted by the committee on electrification, already referred to, from the proposed direct-current standardization.

Particulars are now available of a scheme which has been in existence for two years or more for the electrification of all the lines of the South Eastern & Chatham Railway within a radius of 30 miles from London. This means about 140 route-miles. As in other cases the multiple-unit system will be employed for local suburban trains and electric locomotives for those traveling over the longer distances. Direct-current traction at 1,500 volts will be used. Parliamentary powers have not yet been obtained.

Of all the main lines leading out of London, the Great Eastern Railway has the largest suburban traffic. Extraordinary ingenuity and resource have been displayed to improve the working capacity of the Liverpool Street terminus under steam traction. Electrification has been under consideration for years, but initial capital expenditure has been a bar. No fresh step is announced, but it is the fact that electrification is probably more needed to meet congestion on the company's suburban lines than on any other system leading out of London. It appears that Parliamentary powers for electrification are at present awaiting and will have to be sought.

Other schemes which are still awaiting development and in regard to which nothing immediate is promised are the London & South Western Railway extension of electric traction involving 45 miles of route, the construction of the Wimbledon and Sutton authorized electric railway, the authorized electrification of the London and Southend section of the Midland Railway (about 40 miles of route) and the conversion to electric traction of the main line of the North Eastern Railway from York to Newcastle, and Northallerton to Stockton on Tees loop, in all 110 miles long.

London Underground Railways

With an admirable promptitude Lord Ashfield, chairman of the associated London underground railway companies, as soon as the applicability of the trade facilities act became known, presented a scheme to the government for carrying out the long projected improvements and extensions of the underground system. All these developments already have parliamentary authority, so that no delay would arise in seeking powers. His Lordship sought the government guarantee of interest on new capital which would then be advantageously raised in the city of London. The proposed works, estimated to cost £6,000,000, include the enlargement of the tunnels of the City & South London Railway so as to permit through running with the Charing Cross & Hampstead line and more comfort for passengers by means of more commodious cars, the construction of the Hampstead & Edgmore Railway as a surface extension of the "tube" line, and various short connecting and linking up lines. The application for guarantee was, however, accompanied by a condition that the government should pass legislation in Parliament to give the London General Omnibus Company a monopoly of omnibus street traffic in London for ten years, so that the bus company's revenues might help the underground railways (both being in a common pool) if necessary in maintaining dividends. The government promptly refused to introduce any such legislation, whereupon Lord Ashfield announced that he would try to devise a new scheme which might prove more acceptable.

In connection with government guarantees of interest on capital and the subject of fares, the position of the London underground railways is interesting and peculiar. Under the defense of realm acts (passed during the war and now expired), the ministry of transport act, 1919, and the railways act, 1921, extensive powers were given to the government (and in particular to the Ministry of Transport when it was constituted) to deal arbitrarily and drastically with long established railway arrangements. Under these powers the government, among other things, made great increases in the rates chargeable for freight and in passenger fares. The

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latter, from railway time immemorial, were limited to a maximum of a penny per mile for third class. In view of the great increase in costs the government raised this maximum to 1¾d. per mile. With the exception of the Metropolitan District Railway, the roads in the underground group were not affected, as they had not been taken under government control. Later, the District Railway was also freed from the control, but all roads in the group were allowed to increase their fares in the hope that that would enable them to meet working expenses. The fares have remained on the higher level ever since, but the level except for the shorter journeys is considerably below that of the steam railways of the country.

In regard to the general system of railways in Britain, it is laid down in section 58 of the railways act, 1921, that the charges to be fixed (by the rates tribunal constituted under the act) are to be such as will yield, with efficient and economical working and management, an annual net revenue (called the standard revenue) equal to the revenue of the year 1913, together with revenue to meet capital expenditure since that date. The arrangement is to be reviewed periodically. Thus the whole old penny a mile maximum is swept away, as are also the old rates for freight.

These conditions, however, do not apply to the London underground railways nor to the Metropolitan Railway, which runs 40 or 50 miles into the country. These have not been included in any of the great groups, the idea being that they may ultimately be formed into a group by themselves. So far as a layman, as distinguished from a lawyer, can see, the London underground railways are free from government compulsion as to what fares they may charge. Of course if they get a government guarantee of interest on new capital, conditions might be attached to it. In any case, if unduly high fares were ever charged, these would have to be equaled by the associated London General Omnibus Company, while the latter over a very large area has the competition of the London County Council municipal tramways. Moreover, any increase in fares on the underground railways, even if reasonable and shown to be necessary, raises howls of execration in the London evening newspapers. Further, any attempt by the underground railways to "exploit" London would be followed by government action.

Underground a Philanthropic Institution

Apart from all these safeguards, the management of the underground railways has always gone on the policy of charging the lowest possible fares and of developing the traffic accordingly. No question has arisen, or is likely ever to arise, of the companies making excessive profits. The cost of construction of these lines, both for land and works, was so high that nothing beyond meager dividends can be looked for. The ordinary stock of the District Railway never gets any dividends; the highest that I can remember was 4 per cent on the Central London Railway stock. Very often in other cases one sees dividends of 1 per cent announced or less —sometimes nothing at all. In reality the whole concern is a sort of philanthropic institution for Londoners. The original capital was subscribed in a period of high hopes; as a result the capital cost proved so large and the net revenues so low (in spite of overwhelming passenger traffic) that any "dreams of avarice" must have been keenly disappointed.

Joint committees, representative of employers and employed, are being constituted to deal with questions of wages and conditions of employment on the London underground electric railways. Similar committees already exist in connection with the main steam railway undertakings of the country, but as the underground railways have been left out of the grouping scheme for other railways, they have to act independently. The scheme provides for the formation of sectional committees, departmental councils, an underground council and a negotiating committee. The sectional committees will provide a reorganized means for the discussion and settlement between the employees and the local officials of questions arising out of the employment. The departmental councils will effect similar services on matters which concern two or more sectional committees, while the underground railway council will deal with subjects affecting two or more departmental councils. The negotiating committee will deal with any alteration of any agreement between companies and trade unions and will confirm such alterations before they become operative. No withdrawal of labor or interference with efficient operation is to take place until the cause of the dispute has been dealt with under the machinery provided and a settlement has not been reached within twenty-eight days after reference to the negotiating committee.

Tramway Situation

The present stagnation in tramway extension in this country is illustrated by the fact that in the 1922 session of Parliament only two bills will be promoted to authorize the construction of tramways. There does not seem to be any prospect of improvement till costs of construction have fallen materially. Meantime possible extensions are being worked by motor buses. The main exception to the general discouragement is to be found in Glasgow.

For a long time it has been recognized that the Glasgow Town Council is one of the most enterprising, not to say aggressive, municipal corporations in Britain. Fresh proofs of the energy and expansion, including schemes extending far beyond the city boundaries, are now forthcoming. One of these, for running omnibuses within and outside the city, will be dealt with in an early issue of BUS TRANSPORTATION. Parliamentary powers are also being sought for the construction of several additional tramways and tramroads of considerable length. No doubt it is thought that by the time the work of construction can begin the cost of labor and materials will have fallen substantially.

Another proposal is to take over two existing tramway systems in the neighborhood of Glasgow. First, it is sought to acquire from the Airdrie & Coatbridge Tramway Company the lines in these towns and work them as part of the Glasgow system. These routes cover 2.32 miles of single track and 1.31 of double. The price, which is provided for under an existing tramway order, is £82,250. The other kindred proposal is to offer £200,000 to the Paisley & District Tramway Company for its undertaking, over which at present the Corporation has running powers. The undertaking consists of 14.41 miles of double track and 3.84 miles of single. If these schemes are carried out, continuous tramway communication east and west through Glasgow under one authority will be provided for many miles through an area which for the most part is densely populated, and which includes great centers of industry. There are only two other tram-

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way systems in the vicinity of Glasgow worked by companies, namely the Lanarkshire and the Dumbartonshire.

Largely for the purpose of relieving tramway congestion in the center of the city, Glasgow Town Council has decided to proceed with the erection of an additional bridge across the River Clyde, at Oswald Street, a short distance to the west of the present Jamaica Bridge. The new bridge, which may cost £500,000, will of course carry tramways. The project has been talked about from time to time for several years, and one of the reasons urged for further delay was that two or three years hence the bridge could be built more cheaply than at present, as prices are bound to fall. Members of the Council specially interested in street traffic were, however, urgent in expressing the need for relieving the congestion on Jamaica Bridge and its approaches. It may of course be some little time before contracts are let and the work actually begun.

THE GUARANTEED WEEK

A conference of representatives of British municipal tramways was held in London on Dec. 9 to consider a position which had arisen in the National Joint Council for the tramway industry. Under an agreement reached in March, 1919, tramway employees were guaranteed pay for forty-eight hours a week, even though men employed on part-time cars might work much less time. The arrangement has been found impracticable, because it could not be varied to suit varying local conditions and because it hampered the increase of services during the rush hours. The employers' representatives on the Joint Council sought to have this provision of the agreement revised, but the workmen's representatives refused. At a meeting of the Joint Council in London on Dec. 15, it was unanimously agreed to appoint a joint sub-committee consisting of seven representatives of employers and seven of workers to revise the whole of the terms of the tramway agreement of March, 1919, without binding the Conucil to adhere to the guaranteed forty-eight-hour-week. The question of the guaranteed week remains the bone of contention. The sub-committee is expected to report to the Council in February.

LONDON TRAMWAY FARES

London County Council has now modified the very high fares on its tramways which came into force about a year ago. The results were not all that were expected. Comparative figures for the twelve weeks ended Sept. 28 last and the corresponding twelve weeks of 1920 (which immediately preceded the last increase of fares) showed that passengers had decreased by 11,416,050, while revenue had increased by £147,109. The decreases applied both to passengers and revenue for the short journeys, there being increases in both for the long distances. The highway committee of the Council considered this meant that people were walking the short distances instead of using the cars. To regain the lost traffic, the general manager suggested that the penny fare stage should be increased from 0.6 of a mile to 1.2 miles, that the 1½d. fare should be abolished, and that 2.4 miles should be given for 2d. and 3.6 miles for 3d. It would not be necessary to change the higher fares. The manager anticipated that, while the change would produce a temporary fall in receipts, the revenue would at least recover to the present level by the end of the financial year in May next. In view of savings in expenditure now likely to be effected, he thought the estimate that the financial year would show a slight surplus on working would still be realized. The highway committee supported these proposals, which briefly means adding 0.6 of a mile to the 1d., 2d. and 3d. stages. At the meeting of the County Council on Nov. 15, when the recommendations were submitted and agreed to, Mr. Squires, chairman of the highways committee, described the step as a big experiment, the suggestion for which really emanated from the tramway management, who were practically staking their reputation on its being a success. The reduced fares came into operation on Dec. 1.

In a report to Edinburgh Town Council on the electrification of the cable tramways in the city, R. S. Pilcher, the tramway manager, says that the working expenses per car-mile of the electric tramways in Leith (adjoining Edinburgh) are 15.4d., while the figure for the cable tramways in Edinburgh is 19.63. The difference on the mileage run by the cable cars is equal to £98,000 per annum. This would much more than meet the annual capital charges on the cost of conversion. The total estimated cost of conversion is put at £648,711. Contracts for part of the work have already been let. In regard to Mr. Pilcher's figures of working expenses, it may be noted that the cable system is old, and has been allowed to run down considerably. In past years it used to work very economically.

Nothing Like This in America

LONDONERS are not exactly proud of the dense fog which occasionally descends on the metropolis, says the *Tramway and Railway World*, but though these visitations seriously retard the coming and going of the people, they regard them with a kind of indulgent interest as being of a brand peculiar to London. Not so with the drivers of tramcars, buses and other motor vehicles, who experienced during the four or five days at the end of November a very trying and anxious time. To any one who has not seen a real London fog the appearance, or rather the disappearance, of the street is hardly conceivable. It is practically impossible for anyone to see but a few yards ahead and the fog even resists the penetration of powerful lights.

During the week end of Nov. 22 and 27, the density of the fog which visited London literally disorganized traffic and reduced the otherwise busy thoroughfares to a state bordering on chaos. So bad did conditions become that acetylene flares were lighted at some of the principal crossings to guide vehicular and pedestrian traffic. On the evenings of those two days bus service was gradually prevented owing to the extreme slowness of progress and the risk involved. In some districts where the fog was particularly opaque buses were equipped with extra lamps casting rays sideways and downward to enable the driver to see the curb. During all this time but one or two minor collisions occurred.

W. P. G. Harding, governor of the Federal Reserve Board, in a recent public address, referred to tax-free securities as follows:

> Taxation can be escaped altogether or in part by investing in state and municipal bonds, which are exempt from the income tax, and the ability of municipalities to sell their obligations more readily because of this fact has had a tendency to increase the volume of their indebtedness. Consequently local taxation has increased materially, and unless the issue of tax-exempt obligations is checked the utimate results are likely to be serious.

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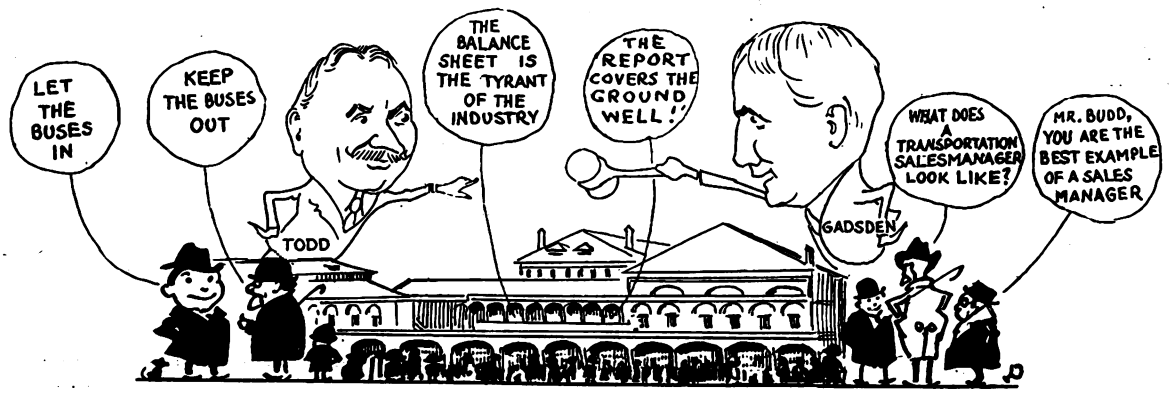
The notion is a mistaken one that the best thing about the year 1921 is that it is a thing of the past

Facts of 1921 "Fictionized"

By G. J. Mac Murray
News Editor "Electric Railway Journal"



"The crowning event of the year was, of course, the convention at Atlantic City in October"

THE STRANGER in Boston starts on a journey to a point in any direction and after meandering around from ten minutes to ten hours arrives at the place from which he started. The difference between the stranger in Boston and the writer is that starting early last January and by depending on his memory and by turning 2,358 pages of the files for the year in an effort to review some of the outstanding happenings of 1921 in the industry he has arrived at practically the same place at which he began. Of course, it isn't quite as bad as that. The statement should be taken metaphorically, not literally.

Elsewhere in this issue the statisticians who play with the figures prove that things in the electric railway industry are a whole lot better than they were a year ago. At least they said that was what they were going to prove. When a statistician starts to prove anything he usually succeeds, for statistics are like hash, you can put almost anything into them. If your mind runs to figures then consult the tables. If you do consult the tables you will find that only one large company went into the hands of receivers in 1921. Here some pessimist will arise to inject the statement that anyway there were only a few large roads left that could do so. Of course, even the Interborough would have been, too, only Mr. Hedley and others celebrated New Year's Eve of 1921 by scraping together $1,000,000, or was it $100,000,000?

It is only proper to start the new year on New Year's eve, but the world knew nothing about the New Year's eve party of Dec. 31, 1921, in New York until the Public Service Commission brought out the fact late in November that by the grace of somebody or other people ride in the subway in New York with Mr. Hedley as general manager instead of with him as receiver. With the Interborough saved, it is, of course, possible to go back and start at the beginning again.

The traction situations in New Orleans, St. Louis, Seattle and in various other places remain for the most part unchanged, but steady progress has been made in Pittsburgh, Albany, Toledo and in other cities. Paul Maloney in New Orleans is still questioning every move made by the local company, but the people there are showing signs of weariness. There will be an election in New Orleans before long and the residents may say it with votes. In which case Mr. Maloney will probably be like Eamon de Valera: he will have lots of fight left, but nobody with whom to pick a quarrel.

In Pittsburgh they have returned to office former Mayor Magee. He was elected just after the first vote had been taken on the new franchise settlement there, but he injected himself into the traction matter either to claim some of the credit for what has been or to exempt himself from responsibility. All the Pittsburgh Railways has to do now is to raise $5,000,000. But speaking of elections, one never can tell what will happen. Take New York, where Mr. Hylan was re-elected on a 5-cent fare, although most of the surface car riders, particularly those in Brooklyn, are paying 10 and 15 cents where they formerly paid 5, and millions of transfers have been cut off. Or take Youngstown, where they elected Mr. Oles as Mayor. Mr. Oles, according to his platform, favors the jitney. But Mr. Oles appears to be out of luck. The local railway there is selling a pass at $1.25 a week, which gives unlimited rides, while jitneys are or were charging 10 cents straight. Mr. Oles took office on Jan. 1. At the time this review was written the prospects were that the pass would put the jitney completely out of business. Thus Mr. Oles is cheated before he begins. The local Youngstown company has taken the electric railway out of politics.

The idea behind this summary was of course to start out in January, 1921, and carry the reader along chronologically. With that in mind for the moment it becomes necessary to start over. An effort will be made to stick to the historical order, but no promise is implied. Early in January the local Amalgamated at Albany

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"The remark 'God bless Stone & Webster' won a prize of $100 for a resident of Seattle who suggested that the best way to settle the problem of the municipal railway would be to beg Stone & Webster, the former owners, to take the road back"

"The hope was expressed that the warring factions would bury the hatchet. Whereupon both sides proclaimed that it had been the other side which had been wielding the deadly weapon. . . . But everything is lovely in Detroit now, with the great pacificator Mr. Dow in the saddle"

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"Mr. Cann contemplates purchasing fifty one-man cars with which he confidently hopes to chase the jitneys off the streets"

decided to go on strike. In other words, Mr. Mahon concluded to come to grips with Mr. Weatherwax. In this tug of war the portly Mr. Weatherwax has drawn Mr. Mahon over the ropes and now eleven months after the battle started the Amalgamated has admitted defeat and cried "Enough!" Of course it was hard on Mr. Weatherwax and the United Traction Company, but in localizing the scrap a lot of other companies saved money and the Amalgamated came to its senses. No other strikes of importance were called during the year.

Out in Seattle they are still at it. In fact it has become "Seattle the Sensational." Mr. Witt says Seattle needs to spend $2,000,000 on its municipal railway. The Mayor regards this as a witless recommendation. "There it is," says Peter. "Take it or leave it." "I have other business in Cleveland." On the other hand, the remark "God bless Stone & Webster" won a prize of $100 for a resident of Seattle who suggested that the best way to settle the problem of the municipal railway would be to beg Stone & Webster, the former owners, to take the road back. As Solomon said: "There's a time to weep and a time to laugh."

It is not Seattle but Mr. Witt that calls to mind the Cleveland low-fare experiment and Ben Ling and a lot of other things. The people of Cleveland apparently were not interested in the 2½-cent fare in the business district. Anyhow, they treated it with such disdain that the experiment was discontinued almost before it had begun. Street Railway Commissioner Sanders says that the low fare failed because Cleveland people were counting even the pennies when the low fare was put into effect. Of course it looks queer to have a low-fare experiment fail when people are counting pennies, but it is a fact. Mr. Sanders suggests that the scheme be tried again.

The low fare may have failed, but there is one howling success in Cleveland. He is over in the Illuminating Building on the Public Square. His name is Ben Ling. As director of the bureau of the Ohio Committee on Public Utility Information Ben beams benignantly on the public press from

"There seemed to be unanimous agreement that it was the best meeting the association ever had' and 'many began before it ended to plan for a similar outing next year! You can't blame them, can you, with the refill station just across the river?"

Cincinnati to the Great Lakes. Ben's bureau for the dissemination of news is only one of many similar bureaus, but he has been eminently successful. Ben's story is best told in figures. There is no other way to tell some stories. He has to his credit 2,500 solid newspaper columns in one year, all to the lasting benefit of the industry, to say nothing of the editorials which he provoked. For the industry as a whole Labert St. Clair during the past year scored heavily with his historical review of the thirty-fifth anniversary of the industry and with his book "Getting the Public Eye and Ear."

Oh, yes, in the great hurry the Detroit election must not be overlooked. They returned Mayor Couzens to office there. In an editorial in the *Electric Railway Journal* just before mutual running rights were arranged between the Detroit United Railway and the Municipal Railway the hope was expressed that the warring factions would bury the hatchet. Whereupon both sides proclaimed that it had been the other side which had been wielding the deadly weapon. It was a gentle battle in Detroit while it lasted, with Mr. Burdick of the Detroit United Railway spirited off to Belle Isle and imprisoned overnight while an army of process servers accompanied by Pinkerton men sought the portly Mr. Goodwin of the municipal railway with writs and other legal documents. But everything is lovely in Detroit now, with the great pacificator Mr. Dow in the saddle.

Before the storm broke in Detroit some of the Detroit United Railway men sought less strenuous fields of endeavor. Thus Mr. Cann has found repose in the office of street railway director at Toledo, Mr. Rifenberick is at Baltimore and Mr. McIntire is at Mobile. At Toledo Mr. Cann has worked well with the genial Frank R.

"Des Moines, after flirting with the jitneys, went back to its old love"

Coates, in charge of the Toledo Railway. It appeared at one time as if there would be no people left in Toledo for Mr. Coates to carry on his cars or for Mr. Cann to record. But things are better there now. In fact, they have become so encouraging that Mr. Cann contemplates purchasing fifty one-man cars, with which he confidently hopes to chase the jitneys off the streets.

The crowning event of the year was, of course, the convention at Atlantic City in October. At that meeting Edwin Gruhl, speaking about "The Traction Industry Today and Four Years Ago," covered about everything worth while. In referring to the Federal Electric Railways Commission, which went the same way as the fourteen points and with no more terrible consequences, Mr. Gruhl said: "The patient has been in a worse way since the commission voted its condition as acute, but it has met the crisis and is now on the road to convalescence." It was and is, if you get what is meant. If you don't then turn back to Mr. Frothingham's paper, "The Basis of Financial Recuperation." As former Vice-President Marshall would say, "You said it." Mr. Frothingham was both lucid and logical. As a parting shot he said: "Credit cannot be re-established without earning capacity, and earning capacity cannot be achieved in the face of public distrust and opposition, the hydra-headed enemy of the industry." So far so good. But if you would dispel distrust and emulate St. George consult Mr. Goodwin of advertising fame, another speaker at the Atlantic City convention, for the weapons with which to slay the dragon that blocks the path.

The last speech is always the best, and the most convincing. This is the reason bus companies were not admitted to membership in the American Electric Railway Association, although the Amalgamated Association had previously welcomed bus operators with open arms. As an abstract

"But Tom (Mitten) is too busy Kissing the Kids at the picnic of his employees . . . . to mind the croakers"

proposition the convention was in favor of such acceptance, but it went on record as considering such action inadvisable at the present time. Just as the crowning event of the year was the convention, so the crowning glory of the convention was, of course the election to the presidency of the genial Robert I. Todd, a Hoosier by adoption with a national reputation for his chicken dinners.

Next in importance to the Atlantic City convention was the mid-year meeting in Chicago in February. Chicagoans are very much the same as other people, but every time a meeting is held there calling for attendance from people from out of town it appears to be necessary to justify the selection of the convention site. This the editor of the *Electric Railway Journal* also felt it incumbent upon him to do, for in the leading editorial in the issue of the paper recording the convention proceedings he completes his justification with the statement, "The mid-year meeting of 1921 has passed into history." After a thing happens it always passes into history. A bromide you say. Not so fast. Doubtless the editor knew what he was doing in coupling the sentiments of dread and satisfaction about Chicago, but the connection is not plain at this distant date. There was so much to praise and so much to say commendatory of that meeting that it is best to repeat for the benefit of those with short memories that the topic was "Finance" and let it go at that. The editor, having heard at the banquet, Mr. Leedy, the humorist of the Youngstown *Telegram*, evidently thought that he too had to try to be funny at the expense of Chicago. No such obligation rests on the writer of this review.

The third most significant meeting of the year was the C.E.R.A. boat trip. The whole story of that trip was told in the subhead to the account in the *Journal* at that time. An annual prize is awarded to the editor who writes the best subhead to any story which appears during the year. The one on this account does the trick so well that it leaves nothing else to be said now. The writer of it should get the bacon. There appears no reason to doubt the assertion of the historian of the meeting to the effect that "there seemed to be unanimous agreement that it was the best meeting the association ever had" and that "many began before it ended to plan for a similar outing next year." You can't blame them, can you, with the refill station just across the river? The summer meeting of the C.E.R.A. is certainly

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something to look forward to and also something to remember.

Almost the last thing mentioned in the reference to the Atlantic City convention a few paragraphs ahead was the jitney. The principal jitney cities this year have been Des Moines, Kansas City, Saginaw, Battle Creek, Muskegon and Newark. It has been a running fight in all of them all year. Kansas City and Saginaw are apparently still not out of the wilderness, but in Des Moines and other cities the issue has been settled. Actors on the vaudeville stage are inured to all kinds of hardships, but Des Moines under the jitneys was too much for them and became to them Death Moines. All over the central west jokes about Death Moines were cracked on the stage by the vaudevillians. And right here let it be said as history that residents of Fall River, Mass., ride for 5 cents, while the residents of Gloucester, also in that state, who chose the bus instead of the electric railway, hang on in buses and pay 10 cents.

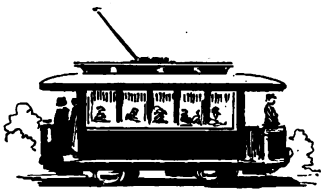
Having dashed East from Des Moines to Massachusetts, it might be well to stick around for a while in the neighborhood of Plymouth Rock. Early in the year the debonair Matt Brush breezed into Boston with a dozen or so of his pet pocket elephants and hung the sign of the Khedive, or whatever other ruler governs the land where elephants are found, so effectively on the legislative investigating commission that the inquiry promptly broke up. Matt succeeded where others had failed — just as he always does. All the while Edward Dana, Mr. Brush's successor on the Boston Elevated, has been struggling with the problem of the accumulated deficit of the Boston "L." This he has cut down a little and is showing black instead of red in his operating statements. Also he has added considerably to the number of 5-cent lines in the suburbs.

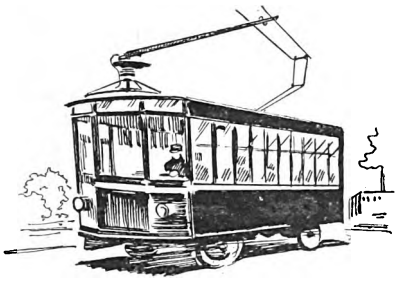
This activity by Mr. Dana in putting in 5-cent lines got him into trouble, for overemphasis by others of the 5-cent experiment made it necessary for Mr. Dana to appear in the New Jersey fare case and set the record straight there. In New Jersey they are charging an 8-cent fare on the lines run by Tom, Dick and Harry, otherwise known respectively as Messrs. McCarter, Danforth and Donecker. And having secured an 8-cent fare the company turned around and sold several million dollars of 8 per cent preferred stock to its patrons. Off by himself in the southern end of the state, at Camden, Martin Schreiber is encountered putting into practice with great success the plans for management and men outlined by him at the convention at Atlantic City a year ago last fall.

And speaking of management and men, who has done better than Mr. Mitten in Philadelphia, right opposite Camden, or is Camden opposite Philadelphia? No matter. At the mention of Mr. Mitten's name, the Anvil Chorus will commence. But Tom is too busy kissing the kids at the picnic of his employees, or driving a hard bargain for the operation of the Frankford "L," built but standing idle, or exchanging notes with Transit Director Twining or giving away his surplus personal funds, to mind the croakers. Tom is like Eva Tanguay. He has now got to the point where he doesn't care, even if he ever did.

In Chicago the peculiar situation was presented of the authority of the Public Service Commission to raise rates under an order from the State Supreme Court being upheld by the United States Supreme Court only to have the Illinois Commerce Commission, the successor to the Public Service Commission, order fares on the surface lines reduced to 5 cents. As a political move this action by the commission was a good storke. If only the theoretical savings in operating expenses worked out as possible by the commission could be realized it would indeed be a very happy New Year in the Windy City.

Speaking about economies and success in overcoming obstacles, it seems that L. S. Storrs, president of the Connecticut Company, deserves honorable mention. Not by any means has Mr. Storrs surmounted all the difficulties with which he has been beset, but he is steadily ascending the heights, so much so that from Hartford came the statement recently that based on a review of the data on file with the State Utilities Commission the Connecticut Company appears to be one of the first properties of its kind in the country to begin to come back.





"The pioneer trackless trolley installation was made at Richmond, Va., early in the year. This of course, put Richmond on the map solidly as the electric propulsion pioneer, for just thirty-five years ago the first successful trolley line in the United States was installed there"

Moreover, Mr. Storrs was the author of the notable article "Our National Fare Experiments," published in the *Journal* for Jan. 1, 1921. That Mr. Storrs knew what he was writing about is evidenced by the record which his property has since made.

But it is getting very tiresome, this chasing around from one city to another and covering hundreds of miles in that many seconds. Suppose for a change some particular subject is taken up. Service-at-cost franchises seem to be about as fitting as anything else at this point. Mr. Nash, as an analyst, said about all there was to be said on that subject at the time he wrote last January. Reference to service at cost recalls of course the original service-at-cost city, Cleveland. Extensions and improvements are needed in Cleveland, and another year the matter of financing them may be solved. If money rates continue to come down the question will probably be settled automatically by it being made possible for the company to sell securities under the terms fixed in the original grant. If not, then the Council may come to its senses. Street Railway Commissioner Sanders there thinks that on the whole the grant has stood the test admirably. Toledo started under service at cost at an inauspicious time. Depression in the auto business hit Toledo especially hard, but the situation there is improving. The situation de luxe under service at cost is at Montreal. There the company has begun to pay off the accumulated dividends on the common stock and the outlook has gradually become so auspicious that a recent quotation for

"Bill Boyce even called pictures by Charlie Chaplin to his aid in inducing traffic on his lines"

that issue was $140 a share, or thereabouts. Rights are even anticipated. Yes, rights! You see, a great many Americans have pressing business in Montreal these days. Didn't the New England Street Railway men even go there to hold a meeting? They can't confiscate your automobile because you happen to have a full belly.

Who shall decide, when doctors disagree,
And soundest causists doubt, like you and me?

These words of Pope call to mind the so-called battle of the systems of years ago with its present parallel in the controversy over the superpower survey report. With Mr. Murray and the *Railway Age* debating in heated terms such topics as coal consumption, or its equivalent, in steam locomotives and in power plants furnishing electric power to electric locomotives, the relative cost of maintaining steam and electric locomotives, etc., what must steam railroad men think who contemplate electrification? The matter can not be decided with the aid of the dictionary and invective. The combatants seem to have lost sight of the admonition:

"Act well your part, there all the honor lies!"

Going back to the geography again two very notable meetings were held in the South, both at Atlanta. One was the Amalgamated Association session; the other was the meeting of the National Association of Railway Commissioners. While ex-Governor Brown of Georgia rained invective upon Mr. Gompers and Mr. Mahon and challenged them repeatedly they ignored the communication. Mr. Gompers had a very wonderful debate with Governor Allen of Kansas some time back which he is not likely soon to forget, and has become increasingly more careful. As for the utility commissioners, they went formally on record against government ownership. It was a costly experiment, the operation of the railroads during the war by the government, but it seems to have been worth the price. Mr. McAdoo doesn't think that it proved much, but there are a lot of people who don't agree with Mr. Mc Adoo.

In the first issue of the *Journal* for 1921 the statement was made in an editorial that constructive legislation should be a feature of 1921. Some forty Legislatures out of the forty-eight met. The legislators heeded the advice given. The most notable examples were indeed in Connecticut and New York. In Connecticut the railway of that name was relieved of paving, bridge and other charges and was granted an extension of time in which to make up back

"Bill Boyce chasing after the dollars"

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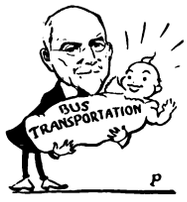
payment then accumulated. In New York the complete reorganization of the commissions was brought about under the plan started on its way for the present New York inquiry. In Illinois the home rule and the 5-cent fare bills were defeated.

As for interviews during the year among the most notable were "Ask the Car Rider" and "Railways' Financial Cycle Has Come." Both of these were written by Bozell, the Boswell to the leaders in the industry. If you don't want to be interviewed be careful how you talk to him. He has a habit of expanding 500 words into 5,000 and then coming around to you with proof of an interview and a portrait in which you are shown seated at your desk reading—of course, of course, the news pages of the *Electric Railway Journal*. Other notable achievements of the interview type were the articles early in the year by members of the Federal Electric Railways Commission.

The pioneer trackless trolley installation was made at Richmond, Va., early in the year. This of course put Richmond on the map solidly as the electric propulsion pioneer, for just thirty-four years ago the first successful trolley line in the United States was started there. Pilgrims from all over the United States gravitated to Richmond to watch the new mode of transport



"A New Baby in the McGraw-Hill Family"

in operation. Among them was a representative of Mayor Hylan of New York and as a result a trackless trolley was later installed on Staten Island to be run and managed by the city. The line was opened just before the fall election in New York city and the ceremonies in connection with it were made the occasion for furthering the political ambitions of the Mayor and his cohorts.

Selling transportation was the subject of the issue of Sept. 24, but it did not by any means contain all the worth-while things on that subject. There was the notable series by William H. Boyce, who is the William S. Hart of this business. Bill Boyce, in chasing after the dollars, even called pictures by Charlie Chaplin to his aid in inducing traffic on his lines. Some day Bill will actually install a moving picture machine on his cars as an inducement to secure riders. Another notable event in connection with the work of selling a road to its patrons was the exhibit of the Chicago Elevated Lines at the pageant in that city. The weekly pass sold the roads in Youngstown and Kenosha to the patrons there.

The most notable valuation cases of the year were of course those involving the properties of the Public Service Railway of New Jersey, the Connecticut Company and the New Orleans Railway & Light Company.

As for the *Electric Railway Journal*, the year was momentous in that the decision was made to establish ***Bus Transportation*** in the interests of co-ordinated passenger transportation service. The reasons for this decision have been given at length. The new paper is the most powerful editorial that ever appeared in the *Electric Railway Journal*.

Thus the reader sees compressed into less than four pages of type an outline of outstanding events which kept a staff of twelve editors busy for a whole year. If you begin to wonder what all these editors do with their time you share with the writer something that is a source of amazement to him and of constant concern to the company executives.

Demand Rate Charge Applied to Fares

A Passenger by Buying a Commutation Ticket for 50 Cents a Month Can Reduce His Fare 50 per Cent—System Works Well in Muscatine and Mason City

IN TWO articles published in the ELECTRIC RAILWAY JOURNAL during 1919 (April 5 and April 19) Richard Schaddelee, vice-president United Light & Railway Company of Grand Rapids, outlined a plan for railway fares which would give the frequent rider a merited advantage over the casual rider in the payment which he was called upon to make for the service. In one of these articles Mr. Schaddelee said among other things:

"The inherent injustice and inequity of any straight fare schedule is that it charges the same fare to all passengers, regardless of the distance they ride and regardless of the number of times they ride per year or month. There has been some deviation from a straight fare basis by the sale of six tickets for a quarter, etc., but these deviations have been few and have not removed the inherent injustice of the straight fare schedule. Theoretically and as a matter of equity and justice, the prices charged for street car service should be based upon two factors, viz.: First, the distance that the passenger rides, and, second, the number of times a passenger rides per year or per month. The unfairness of charging a passenger the same fare for riding half a mile as for riding from 5 to 8 miles is readily appreciated and understood by every one. For that reason there has always been much earnest discussion in regard to ways and means to eliminate this injustice, or at least reduce it, and as a result we have the zone system.

"It is not my purpose to discuss this injustice of the fixed fare in connection with the distance of the ride, as this injustice cannot be solved apparently without the zone system, with its undesirable results in causing a congestion of population. The much greater injustice to my mind is the injustice of the fixed fare as applied to a passenger who uses the street car service, say, five or ten times per month and the passenger who uses it from forty to a hundred times a month."

As a basis for overcoming this injustice, Mr. Schaddelee suggested the sale to passengers of a commutation ticket for, say, $6 a year or 50 cents a month by which he would be entitled to ride at reduced rates as often as he desired during the period in which the ticket was in force. Mr. Schaddelee suggested in the article referred to that the fare to the passenger not holding one of these cards should be 10 cents and the fare to a ticket holder should be 5 cents. This plan, it will be noticed, differs quite radically from the plan of a straight fare used at Youngstown, Racine, and other places. The charge for the card is considerably less, but the passenger pays some fare when he gets on the car.

COMMUTATION TICKET ON MUSCATINE CITY LINES

Results for month of November, 1921, of demand form of street railway fare as compared with flat fare of 7 cents in force during month of October, 1921.

		Fare Rates	
Single fare without ticket		10 cents	
Monthly commutation ticket cost		50 cents	
Cash paid on car by owner of monthly ticket		5 cents	
Children		4 cents cash or two for 7 cts.	
Revenue Passengers:			
10 cents cash		43,834	
Commutation ticket passengers		49,313	
Children		5,673	
Total revenue passengers — November		98,819	
Total revenue passengers — October		108,916	
Decrease — passengers		10,097	
Decrease — per cent		9.27	
Passenger revenue			
10 cents cash		$4,383.40	
977 commutation tickets at 50 cents ea.	$488.50		
49,313 commutation ticket passengers at 5 cents each	2,465.65	2,945.15	
5,672 children		220.58	
Total passenger revenue — November		$7,558.13	(thirty days)
Total passenger revenue — October		7,034.62	(thirty-one days)
Increase November over October		523.51	
Per cent increase		7.44	
		Nov.	Oct.
Average receipts per revenue passenger—total		7.65 cents	6.48 cents
Average receipts per commutation ticket passenger—		6.11 cents	
Average commutation tickets outstanding for November—		851	
Average rides per ticket per day		1.732	
Average rides per ticket per month		51.95	

PLAN IN USE NOW IN TWO CITIES

At that time the plan had not been put into effect in any city. Finally, it has been put into force on two properties, and on one it has been in use since August, 1920, and on the other since October, 1921. Both of these

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properties are controlled by the United Light & Railway Company. The first is on the local lines in Mason City, Iowa, of the Mason City & Clear Lake Railway. The second is on the local lines in Muscatine, Iowa, of the Clinton, Davenport & Muscatine Railway. The Mason City lines have therefore had the system in use for about seventeen months and the Muscatine lines for three months.

The cash fare is 10 cents in each case, but any one can purchase a monthly commutation ticket for 50 cents, good for one month, and if this ticket is presented to the conductor when the passenger enters the car he is entitled to a ride on the payment of 5 cents. When the passenger boards the car he simply shows the card to the conductor and drops a nickel in the fare box. The conductor does not have to touch either the card or the money. Originally when the plan was inaugurated at Mason City a charge of $1 was made for a ticket, but later this charge was reduced to 50 cents and the sale of tickets nearly doubled. In the meantime in November, 1921, the first month in which the plan was installed, the company sold 977 commutation tickets. In December the number sold was more than 1,100.

Each month the card carries a distinctive color, and the name of the month for which the card is good is stamped in heavy ink over the entire card. The pass is good only for the person whose name appears on it, and if presented by any one else can be taken up by the company. While there is always some possibility that the card may be used by some other person the company considers the danger of this slight because if the owner of the card lets some one else use it he cannot ride for a nickel until the card is returned to him. A statement showing the results for November, 1921, with this system of fares on the Muscatine City lines as compared with October, 1921, when the fare for every passenger was 7 cents, is given in the accompanying table. As will be seen the receipts increased 7.44 per cent, although the average fare per commuting passenger was 6.11 cents, as against an average rate in October for all passengers of 6.48 cents.

When the plan was introduced in Muscatine it was well advertised in the daily papers and in other ways. In these advertisements a list was published of the places where the tickets could be purchased. They included a number of prominent stores in Muscatine. The following are extracts from some of the effective advertisements issued by the company as part of an aggressive sales campaign:

To the Automobilist

Cold or wet weather makes walking or the using of your car a disagreeable task—why do it when you can ride in comfort for only 5 cents? Buy one of our commutation tickets today and laugh at the weather man. An economical, comfortable, companionable ride that brings you to the factory, store, office or home in a pleasant frame of mind, ready for a big day's work or an enjoyable evening

Eat Lunch at Home

Enjoy your meals at home? I'll say you do. No fun eating from a dinner pail even if it is a full one. It only costs 10 cents to go home at noon for an honest to goodness meal with the folks. Monthly cards are still on sale at the regular places.

Get the Street Car Habit

Don't you remember the nice visits you used to have going downtown on the street cars? Get the street car habit again. It is pleasant, safe, comfortable and inexpensive, as well as "clubby." Purchase a November commutation ticket for 50 cents and ride as frequently as you desire for a nickel a ride.

Not Too Late to Buy Now

It is not too late to get a monthly commutation ticket. If you have been paying a 10-cent fare, don't do it again. You are wasting money. Just get a monthly ticket and only pay 5 cents a ride during the rest of the month. Don't forget to buy at once. Every day you delay is costing you 5 cents a ride more than it need to. They are still on sale at the regular places.

Advantages Summarized

Some of the merits of this system as summarized by Mr. Schaddelee in a statement within the last month and based on the experience mentioned are as follows:

"Under this scheme every one who boards the car puts into the fare box either a dime or a nickel, so that there is no making of change by the conductor. This greatly facilitates the handling of the cars and passengers, especially in the case of one-man cars, which are used exclusively in Muscatine and Mason City.

"The oftener the owner of a pass card rides during the month the less his average cost per ride is. With 200 rides per month, the total average cost is 5¼ cents. With 100 rides it is 5½ cents. With fifty rides it is 6 cents. With twenty-five rides it is 7 cents. With fifteen rides it is 8⅓ cents. The value of the plan is not

This Ticket Entitles a Passenger to Ride for 5 Cents When the Cash Fare Is 10 Cents

so much in the 50-cent fixed charge, which the purchaser of the pass card pays to the company, but in the fact that the possession of the card induces him to ride a great deal oftener than he would if he had to pay the 10-cent fare charge for cash passengers every time he rides.

"Simply to increase fares is no remedy where the revenues of a street railway company are insufficient, especially where the increases are made on the straight fare basis to everybody.

"Conditions have changed very greatly since the advent of the automobile. We have felt that people who used the service regularly, and by whose patronage only it is possible to continue the service, should obtain the lowest possible fare, and this in proportion to their use of the service. The visitor or the automobile driver who uses the street railway service only in inclement weather, or when his machine is out of commission, is fortunate to get reliable service as cheap as 10 cents a ride, as he is really getting the equivalent of taxicab service which he would otherwise have to employ.

"Our experience with the plan so far has been extremely satisfactory from the operating standpoint, and in addition to this it has taken very well with the public. It has the additional advantage that the resultant fare can be varied between any desired limit without changing the basic fares of 5 cents and 10 cents."

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New Electric Rolling Stock Ordered

Total Number of New Cars Ordered During 1921 About One-third of that for 1920—Percentage of New Safety Cars of Total Number Ordered for City Passenger Service Also Decreased—Remodeling of Old Equipment Quite General

THE statistics for new electric rolling stock given in the tables herewith show in a very striking manner the low point to which the electric railway industry has fallen. The total of 1,276 new cars ordered during 1921 is about one-half that for any previous year recorded. The year 1918 held the previous low record with 2,419 cars and locomotives.

The totals for cars purchased during 1919 and 1920 were increased largely by the number of safety cars ordered, but during the past year safety car sales have decreased even in a greater ratio than have those for two-man cars used in city service. Only 565 safety cars were purchased during 1921, as compared with 1,699 for 1920 and 1,383 for 1919. The two largest car orders for the year were that of the city of Detroit for 225 safety cars and fifty Peter Witt type and that of the Toronto Transportation Commission for 140 two-man motor cars, sixty trailers and fifty Peter Witt type. This year's statistics include two rapid transit orders. The Frankford Elevated Railway of Philadelphia purchased fifty motor cars and the Hudson & Manhattan Railroad of New York twenty-five motor cars. Aside from these orders there were but nine other companies which purchased twenty or more cars. The Chicago Surface Lines purchased fifty trailers and constructed two motor cars in its own shops. The Los Angeles Railway Corporation purchased twenty-five safety cars and twenty-five 48-ft. passenger cars. The United Railways & Electric Company of Baltimore purchased thirty-two safety cars. The Southern Pacific Lines purchased twenty motor cars and ten trailers for interurban service. The Pacific Electric Railway Corporation purchased thirty cars for interurban service. The Hydro-Electric Power Commission purchased twenty-five safety cars, the New York, New Haven & Hartford Railroad purchased eight motor cars and fourteen trailers for interurban service, the Peoria Railway purchased twenty safety cars, and the

TABLE I—NEW ROLLING STOCK ORDERED SINCE 1907

Year	Passenger Cars: City	Passenger Cars: Interurban	Freight and Misc. Cars	Electric Locomotives	Total
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	605	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598
1921	1,059	129	81	7	1,276

(a) Included in "Freight and Miscellaneous Cars."

TABLE II—SPECIAL COMPARISONS OF NEW ROLLING STOCK ORDERED

	1921	1920	1919	1918	1917	1916
Number of railways reporting new cars	94	172	160	140	182	250
Total number of cars	1,276	3,581	2,429	2,375	2,406	3,911
City Service:						
Number of safety cars	565	1,699	1,383	644	280	187
Number of two-man passenger motor cars*	383	847	635	1,068	1,316	2,731
Number of passenger trailers	111	343	111	130	402	128
Service cars	47	104	31	(a)	(a)	(a)
Total cars, city service	1,106	2,993	2,160	1,842	1,998	3,046
Interurban Service:						
Number of two-man passenger motor cars	103	195	96	200	158	303
Number of passenger trailers	26	32	32	55	27	71
Number of freight and express cars	34	361	141	(a)	(a)	(a)
Total cars, interurban service	163	588	269	255	185	374
Number of electric locomotives	7	17	18	44	49	31
Number of cars and electric locomotives built in railway companies' shops	44	166	165	89	281	445

* Includes motor and trailer cars for subway and elevated service.
(a) Not available.

TABLE III—ROLLING STOCK ORDERED DURING 1921

New England District

	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
Connecticut:					
The Connecticut Co.	3	Passenger	43′—0″	C	M
Danbury & Bethel St. Ry.	2	Safety	28′ ½″	C	M
New York, New Haven & Hartford R.R.	8	Passenger	72′—7½″	I	M
New York, New Haven & Hartford R.R.	14	Passenger	72′ 7½″	I	T
Waterbury & Milldale Tramway Co.	2	Passenger	37′ 5″	I	M
Maine:					
Androscoggin Electric Co.	1	Passenger	47′ 5″	I	M
Androscoggin Electric Co.	2	Snow Plows	15′ 1″	I	M
The Androscoggin & Kennebec Ry.	3	Safety	28′ ½″	C	M
The Androscoggin & Kennebec Ry.	*1	Line	40′ 0″	C	M
The Androscoggin & Kennebec Ry.	*1	Work	43′ 0″	C	M
Bangor Ry. & Electric Co.	6	Passenger	40′ 3″	I	M
Massachusetts:					
Boston Elevated Ry.	4	Flat	40′ 0″	C	T
Boston Elevated Ry.	2	Snow Plows	42′ 4″	C	M
Massachusetts Northeastern St. Ry.	12	Safety	28′ ½″	C	M
New Hampshire:					
Dover, Somersworth & Rochester St. Railway	4	Safety	28′ ½″	C	M
Rhode Island:					
Newport County Electric Co.	*1	Snow Plow	40′ 0″	C	M
United Electric Railways	4	Snow Plow	41′ 0″	C	M
United Electric Railways	1	Sweeper	39′ 0″	C	M
Total for New England District	71				

North of the Ohio and East of the Mississippi River

Illinois:					
Alton, Granite & St. Louis Trac. Co.	9	Safety	28′ ½″	C	M
Aurora, Elgin & Chicago R.R.	1	Passenger	46′ 0″	I	T
Cairo Ry. & Lt. System	1	Mail	....	I	M
Centralia & Central City Trac. Co.	4	Safety	27′ 9½″	C	M
Chicago Surface Lines	*1	Passenger	29′ 4½″	C	M
Chicago Surface Lines	*1	Passenger	37′ 2″	C	M
Chicago Surface Lines	50	Passenger	47′ 6″	C	T
East St. Louis, Columbia & Waterloo Railway	1	Express	50′ 0″	I	M
Illinois Central Elec. Ry.	6	Passenger	72′ 0″	I	M
Peoria Ry.	20	Safety	28′ ½″	C	M
Sterling, Dixon & Eastern Elec. Ry.	2	Safety	28′ ½″	C	M
Indiana:					
Chicago, South Bend & N. Indiana Railway	*1	Express	53′ 10″	I	M
Chicago, South Bend & N. Indiana Railway	*1	Snow Plow	47′ 9″	I	M
Indiana Service Corporation	*1	Work	42′ 0″	I	M
Union Traction Co. of Indiana	7	Stock	45′ 6″	I	T
Union Traction Co. of Indiana	12	Safety	28′ ½″	C	M
Maryland:					
The Hagerstown & Frederick Ry. Co.	1	Passenger	47′ 9″	I	M
United Railways & Elec. Co.	32	Safety	30′ 1″	C	M
Michigan:					
City of Detroit—Dept. of Street Rys.	50	Peter Witt	47′ 3″	C	M
City of Detroit—Dept. of Street Rys.	50	Safety	27′ 0″	C	M
City of Detroit—Dept. of Street Rys,	175	Safety	28′ ½″	C	M
New Jersey:					
Morris County Traction Co.	1	Sweeper	....	C	M
New York:					
Albany Southern R.R.	*1	Freight	47′ 0″	I	M
Elmira Water Light & R.R. Co.	11	Safety	27′ 10″	C	M
Fonda, Johnstown & Gloversville R.R.	*2	Rotary Plows	25′ 0″	I	M
Hudson & Manhattan R.R.	25	Passenger	51′ 3½″	R.T.	M
Syracuse & Suburban R.R.	‡1	Rotary Plow	22′ 2″	I	M
United Traction Co.	11	Safety	28′ ½″	C	M
Western New York and Penna. Traction Co.	1	Sweeper	35′ 0″	I	M
Ohio:					
The Cincinnati Traction Co.	2	Work	44′ 0″	C	M
The Dayton & Western Traction Co.	2	Passenger	62′ 5″	I	M
The Dayton & Western Traction Co.	2	Passenger	54′ 11″	I	M
Shenango Valley Traction Co.	17	Safety	28′ ½″	C	M
The Tiffin, Fostoria & Eastern El. Ry.	1	Work	40′ 6″	I	M

(Table III Continued on Page 35)

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TABLE III—ROLLING STOCK ORDERED DURING 1921

(Continued from Page 34)

	Number	Type	Over-all Length		City or Interurban	Motor or Trailer
Pennsylvania:						
The Beaver Valley Traction Co.	10	Safety	27′	10″	C	M
Buffalo & Lake Erie Traction Co.	*1	Work	50′	0″	I	M
Conestoga Traction Co.	6	Safety	28′	½′	C	M
Eastern Pennsylvania Rwys.	1	Snow Plow	41′	0″	I	M
Ephrata & Lebanon St. Ry.	1	Freight	50′	0″	I	M
Fairchance & Smithfield Trac. Co.	1	Safety	28′	½″	C	M
Frankford Elevated Ry.	50	Passenger	55′	0″	R.T.	M
Johnstown & Somerset Ry.	4	Passenger	45′	0″	I	M
Johnstown Traction Co.	1	Sweeper	28′	3″	I	M
Lehigh Valley Transit Co.	1	Work	....		C	M
Northwestern Pennsylvania Ry.	1	Freight	35′	10″	I	M
Philadelphia Rapid Transit Co.	*1	Line	40′	2′	C	M
West Penn Railways	9	Passenger	56′	10″	I	M
West Penn Railways	10	Passenger	43′	0″	C	M
Wisconsin:						
Eastern Wisconsin Elec. Co.	6	Safet	28′	½″	C	M
Wisconsin-Minnesota Lt. & Pwr. Co.	4	Safety	27′	9½″	C	M
Wisconsin Public Service Co.	4	Safety	28′	½″	C	M
Total North of Ohio and East of Mississippi	614					

‡ Second hand.

South of the Ohio and East of the Mississippi River

Florida:						
Miami Peach Electric Co.	8	Safety	28′	½″	C	M
Tampa Electric Co.	12	Safety	28′	½″	C	M
Georgia:						
Columbus Electric Co.	4	Safety	28′	½″	C	M
Georgia Ry. & Power Co.	6	Passenger	44′	6″	C	M
Georgia Ry. & Power Co.	*1	Work Car	34′	0″	C	M
Macon Ry. & Light Co.	13	Safety	28′	½″	C	M
Kentucky:						
Kentucky Traction & Terminal Co.	10	Passenger	40′	3″	I	M
Kentucky Utilities Co.	2	Safety	27′	9½″	C	M
North Carolina:						
Carolina Power & Light Co.	3	Safety	28′	½″	C	M
West Virginia:						
Charleston Interurban R.R.	8	Safety	27′	9½″	C	M
Total South of the Ohio and East of the Mississippi	67					

West of the Mississippi River

Arkansas						
Little Rock Ry. & Elec. Co.	1	Sweeper	28′	3″	C	M
Southwestern Gas & Elec. Co.	2	Safety	28′	½″	C	M
California:						
Glendale & Montrose Ry.	1	Safety	28′	½″	C	M
Los Angeles Ry. Corp.	25	Safety	28′	½″	C	M
Los Angeles Ry. Corp.	25	Passenger	48′	0″	C	M
Pacific Electric Ry. Corp.	30	Passenger	..	..	I	M
San Francisco-Oakland Terminal Rys	*1	Passenger	48′	6″	C	M
Santa Barbara & Suburban Ry. Co.	11	Safety	28′	½″	C	M
Colorado						
Denver Tramway Co.	*20	Passenger	46′	0″	C	M
Denver Tramway Co.	2	Sweeper	45′	0″	C	M
Denver Tramway Co.	8	Sweeper	22′	0″	C	M
Denver Tramway Co.	2	Work	....		C	M
Denver Tramway Co.	5	Dump	....		C	T
Iowa:						
Burlington Ry. & Lt. Co.	8	Safety	28′	½″	C	M
Sioux City Service Co.	1	Safety	28′	½″	C	M
Kansas:						
Arkansas Valley Interurban Ry.	1	Safety	22′	4″	I	M
Minnesota:						
Twin City Rapid Transit Co.	*1	Passenger	46′	0″	C	M
Twin City Rapid Transit Co.	*1	Passenger	46′	0″	C	T
Mississippi:						
Delta Light & Traction Co.	4	Safety	28′	½″	C	M
Missouri:						
Cape Girardeau-Jackson Int. Ry.	3	Safety	28′	½″	C	M
Kansas City, Clay County & St. Jos. Railway	*6	Freight	41	0″	I	T
The Southwest Missouri R.R.	8	Safety	28′	½″	C	M
Nebraska:						
Omaha, Lincoln & Beatrice Ry.	1	Snow Plow	40′	0″	I	M
Oklahoma:						
Pittsburgh County Ry.	1	Passenger	43′	7″	I	M
Oregon:						
Southern Pacific Co.	20	Passenger	59′	7″	I	M
Southern Pacific Co.	10	Passenger	59′	7″	I	T
Texas:						
Abilene St. Ry. Co.	2	Safety	28′	½″	C	M
El Paso Electric Ry.	5	Safety	28′	½″	C	M
Rio Grande Valley Traction Co.	5	Safety	28′	½″	C	M
Utah:						
Bamberger Electric R.R.	1	Passenger	50′	0″	I	M
Bamberger Electric R.R.	1	Passenger	50′	0″	I	T
Total West of the Mississippi River	212					

Canada

British Columbia Elec. Ry.	10	Safety	28′	½	C	M
Hull Electric Co.	2	Safety	32′	0″	C	M
Hydro-Electric Railways	25	Safety	28′	½″	C	M
The Ottawa Electric Railway	2	Safety	28′	½″	C	M
Toronto Suburban Railway	1	Freight	....		I	M
Toronto Suburban Railway	1	Express	....		I	T
Toronto Transportation Commission.	140	Passenger	51′	10″	C	M
Toronto Transportation Commission.	60	Passenger	49′	2″	C	T
Toronto Transportation Commission.	50	Peter Witt	52′	3½″	C	M
Toronto Transportation Commission.	3	Work	....		C	M
Toronto Transportation Commission.	6	Sweepers	....		C	M
Winnipeg Electric Ry.	5	Safety	30′	3½″	C	M
Total for Canada	305					

* Built in company's shops. ‡ Second-hand.

TABLE IV—ELECTRIC LOCOMOTIVES

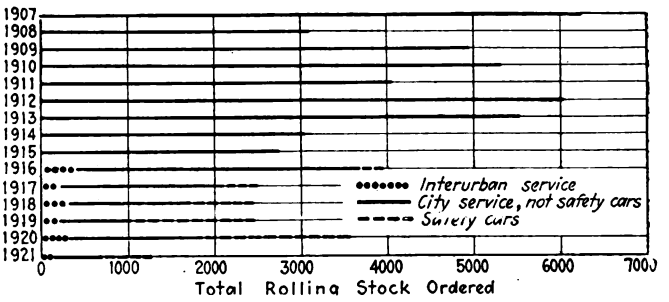
	Number	Weight Tons	Length Over All Ft.	In.
North of the Ohio and East of the Mississippi River				
Chicago, South Bend & Northern Indiana Ry.	*1	..	47	9
Illinois Central Electric Ry.	1	..	..	..
Southern Illinois Railway & Power Co.	1	..	32	0
Washington & Old Dominion Railway	1	50	..	..
West of the Mississippi River				
Central California Traction Co.	*1	..	40	0
Pittsburgh County Railway (Oklahoma)	1	30	45	0
Tama & Toledo R.R. (Iowa)	1	..	30	0
Total	7			

*Built in company's shops.

Denver Tramway Company built twenty passenger cars in its own shops.

The number of companies that reported new equipment ordered during 1921 is ninety-four, as compared with 172 during 1920 and 160 during 1919. Of the ninety-four companies reporting, two purchased 250 cars or more, three fifty to sixty cars, one thirty-two, seven twenty to thirty cars, twelve from ten to twenty cars, seventeen from five to ten cars and fifty-two companies purchased less than five cars each. Safety cars were purchased by forty-five railways, as compared with 113 which invested in this type of car in 1920. Five of these railways were in Canada and they purchased forty-four safety cars.

An accompanying table and chart gives a comparison of the new rolling stock ordered by years since 1907.



NEW CARS AND LOCOMOTIVES ORDERED BY YEARS

In this chart the division by city and interurban cars is not made prior to 1916.

The table divides the passenger cars into city and interurban types and gives separate tabulations for freight and miscellaneous cars and electric locomotives. The chart for the years since 1916 divides the cars purchased into safety cars, those for city service (not safety cars) and those for interurban service.

A detailed classification of the cars ordered during the last six years is given in Table II. This gives separate comparisons of cars for city service and those for inter-

TABLE V—RECAPITULATION BY DISTRICTS OF CARS AND LOCOMOTIVES ORDERED DURING 1921

	New England District	North of the Ohio and East of the Mississippi River	South of the Ohio and East of the Mississippi River	West of the Mississippi River	Total for United States	Total for Canada	Total
Number of companies reporting	12	43	9	23	87	7	94
Number of companies ordering safety cars	4	16	7	13	40	5	45
City Service							
Safety cars	21	374	50	76	521	44	565
Passenger cars { Motor	3	137	6	47	193	190	383
Passenger cars { Trailer	0	50	0	1	51	60	111
Service cars	14	5	1	18	38	9	47
Total cars city service	38	566	57	142	803	303	1,106
Interurban Service							
Passenger cars { Motor	17	24	10	52	103	0	103
Passenger cars { Trailer	14	1	0	11	26	0	26
Express and freight cars	2	23	0	7	32	2	34
Total cars interurban service	33	48	10	70	161	2	163
Electric locomotives	0	4	0	3	7	0	7
Total cars and electric locomotives ordered	71	618	67	215	971	305	1,276

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urban service. All classes show a marked decrease in the number ordered over previous years. The number of passenger trailers for city service, however, is the same as for 1919 and the number of service cars ordered for city service is sixteen more than for the year 1919. Cars of all kinds built in railway shops total but forty-four, which is a large decrease over previous years. The number of interurban trailers purchased has decreased from thirty-two for 1919 and 1920 to twenty-six for 1921. An interesting comparison is afforded by the percentage that the number of safety cars purchased is of the total number of passenger cars for city service. This is 64.9 per cent for 1919, 58.8 per cent for 1920 and 53.3 per cent for 1921. The percentage is thus seen to be gradually decreasing.

Table III shows the details of rolling stock ordered by the individual companies. The companies for each state are alphabetically arranged and the various states are grouped into four districts in a similar manner to that followed last year. Canadian railways are listed separately. The totals for the various districts are seventy-one cars for the New England district, 614 cars and four locomotives north of the Ohio River and east of the Mississippi, sixty-seven cars south of the Ohio River and east of the Mississippi, 212 cars and three locomotives west of the Mississippi and 305 cars for Canadian railways. The table gives information as to the number and types of cars purchased, the class of service and their over-all length. A recapitulation of the totals for cars and locomotives ordered is given in Table V.

The companies which purchased or built electric locomotives during 1921 are listed in Table IV. There are but seven of these, which is the smallest number for any year of which we have a record.

The information given in these tables was obtained from replies received to questionnaires sent to all electric railways in the United States and Canada. Answers were received from more than 750 railways and the information thus received has been supplemented by notes previously published and by lists furnished by the various car builders. Through the courtesy and co-operation of the car builders it has been possible to check these figures very accurately, and in some cases where railways did not report the figures as furnished by the car manufacturers have been used.

The ELECTRIC RAILWAY JOURNAL wishes to thank all who co-operated in making this list so complete and made possible the publication of this information.

Automotive Equipment Owned by Electric Railways

Survey of the Industry Shows that Nearly 1,500 Cars Are Used in Conducting Transportation, Maintaining Track and Overhead, and for Emergency Purposes

UNTIL this year the ELECTRIC RAILWAY JOURNAL has never made any attempt to secure statistics on the automotive equipment owned by the electric railways. Figures have been compiled which show how many automobiles are required to make possible the carrying out of certain phases of work. The information is presented under the same classifications as the rolling stock and track mileage statistics, *i.e.*, by states, which are segregated by territories. Since this is the first time the industry has been solicited for data on automotive equipment, the table is not as complete as those which have been compiled from year to year by the ELECTRIC RAILWAY JOURNAL. However, replies were received from practically all the large companies and the figures may be said to represent roughly 90 per cent of the total equipment in use by the electric railways.

Practically it is almost impossible to present this material in such a compact manner as to indicate simultaneously the type and capacity of a truck and the service in which it is employed. The classification according to service seemed the most desirable way to collate the information. Of the service cars the tower wagons probably form a more rigid classification than those of any other type. The other uses in electric railway work to which a truck can be put require so little body construction of a special nature that a machine with a flat body is an extremely versatile piece of equipment. For this reason it is correspondingly difficult to assign each vehicle to any particular designation. Nevertheless this has been done according to the information furnished. Therefore under each particular grouping have been placed trucks of various capacities and with different types of bodies.

STATISTICS OF AUTOMOTIVE EQUIPMENT OWNED BY ELECTRIC RAILWAYS IN THE UNITED STATES*

	Service Cars						Passenger Cars		
	Tower Wagons	Line Maint.	Track Maint.	Trucks	Emergency	Miscellaneous	Touring	Roadsters	Closed
New England States:									
Connecticut	5	3	0	6	0	6	9	2	1
Maine	1	1	2	1	0	0	4	11	4
Massachusetts	37	5	38	30	4	6	32	43	2
New Hampshire	..	..	..	..	..	..	..	..	..
Rhode Island	0	0	1	1	0	0	5	0	0
Vermont	0	1	0	0	0	0	0	0	0
Total	43	10	41	38	4	12	50	56	7
Eastern States:									
Delaware	..	..	..	..	..	..	..	..	..
District of Columbia	0	2	1	7	4	1	1	..	1
Maryland	5	4	5	5	0	4	6	1	1
New Jersey	..	..	..	..	..	..	..	..	..
New York	18	16	42	14	7	11	13	30	5
Pennsylvania	11	10	2	10	1	5	11	4	2
Virginia	1	1	0	0	0	0	0	0	0
West Virginia	2	3	2	1	0	1	3	3	..
Total	37	36	52	37	12	22	34	38	9
Central States:									
Illinois	7	14	7	23	0	0	4	5	1
Indiana	5	9	3	1	0	4	16	4	1
Iowa	4	4	4	1	1	3	3	19	1
Kentucky	4	3	3	3	0	2	3	2	0
Michigan	6	3	1	12	1	0	14	6	5
Minnesota	5	0	0	4	0	7	4	5	4
Missouri	21	5	8	11	1	10	9	18	5
Ohio	14	24	17	10	2	11	18	16	3
Wisconsin	1	29	6	9	0	0	25	33	4
Total	67	91	49	74	5	37	96	108	24
Southern States:									
Alabama	2	6	6	3	0	3	3	0	0
Arkansas	0	3	0	0	0	0	0	0	0
Florida	1	0	0	0	0	0	0	0	0
Georgia	4	3	1	6	0	1	12	3	0
Louisiana	1	6	15	0	0	1	0	1	0
Mississippi	0	1	0	0	0	1	3	0	0
North Carolina	0	0	0	0	0	1	0	0	0
South Carolina	1	0	0	0	0	0	1	0	0
Tennessee	3	2	3	1	0	1	2	3	0
Total	12	21	25	10	0	8	21	7	0
Western States:									
Arizona	0	0	0	1	0	0	..	..	..
California	20	17	29	10	4	6	21	16	0
Colorado	4	0	3	2	0	1	8	2	0
Idaho	0	0	0	1	0	0	0	0	0
Kansas	2	1	2	1	0	0	2	1	0
Montana	0	0	0	1	0	1	0	0	0
Nebraska	1	2	3	0	0	2	6	0	0
Nevada	..	..	..	..	..	..	..	..	..
New Mexico	..	..	..	..	..	..	..	..	..
North Dakota	..	..	..	..	..	..	..	..	..
Oklahoma	1	1	0	1	1	0	0	0	0
Oregon	5	0	1	0	1	0	4	1	0
South Dakota	..	..	..	..	..	..	..	..	..
Texas	12	3	3	7	2	46	7	1	0
Utah	1	0	0	0	0	0	1	0	0
Washington	3	1	3	0	0	4	5	8	0
Wyoming	..	..	..	..	..	..	..	..	..
Total	49	25	45	24	8	60	54	29	0
Totals	208	183	212	183	29	139	255	238	40
Total service cars—954			Total passenger cars—533						

*Exclusive of motor buses, for which see ELECTRIC RAILWAY JOURNAL, Aug. 27, 1921, page 319.

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The differentiation between service cars and passenger cars also is not distinct. There are many service cars constructed from passenger car chassis, while in the same way trucks are used for several purposes such as line and track maintenance. Some vehicles are also used as line cars and as a means of transport for transportation and other officials. This is true more especially on the smaller properties. It was attempted, however, to put a passenger car under this classification whenever it was clearly such, regardless of the duty it performed.

Some additional facts revealed by the survey but not included in the tabulation may be of interest. About one-third of the service cars have a chassis of 1-ton capacity. Of these approximately two-thirds are equipped with pneumatic tires. The next largest grouping is the 2-ton cars, which includes nearly 200 vehicles. Only one-third of this latter classification have pneumatic tires. Of the 533 passenger cars, 267 are Fords while 68 are Dodges. The remaining 198 are distributed among nearly as many makes.

Improved Financial Condition Established

War-Time Period a Disastrous One for Electric Railways—Return of More Normal Conditions Helps Companies—Fewer New Receiverships This Year—Three Terminated Without Foreclosure

A CONTINUATION of the tendency toward an improvement of conditions in the street railway industry is evident from the statistics of electric railway receiverships and foreclosures for the year 1921, presented herewith. One year ago a change for the better was noted in this paper in the corresponding article on electric railway receiverships. The rising tide in the number of receiverships and foreclosures, and the amount of mileage and securities involved, reached its maximum point in the statistics of the year 1919. In 1920 there was a material reduction in the number of additional companies so involved, and the past year, 1921, showed a further, though slight decrease. Only six companies were reported as having abandoned their entire service and track, as compared with sixteen companies during 1920. Evidently the weakest properties have been now pretty completely eliminated through drastic reorganizations or total abandonments.

During 1921 sixteen additional companies went into receivership, and thirteen companies were sold at foreclosure, or drastically reorganized. The total single track mileage of the companies which went into receivership during 1921 was 917.82. Only one large company was included, the Ohio Electric Railway Company, which with its three subsidiaries, the Indiana, Columbus & Eastern Traction Company, the Fort Wayne, Van Wert & Lima Traction Company and the Columbus, Newark & Zanesville Electric Railway Company, made up 497 miles of the 917-mile total.

The threatened receivership of the Interborough Rapid Transit Company, New York, had it occurred this year, would have swollen greatly the figures of mileage and securities in receiverships. Fortunately, this has not occurred, although the matter is still before the court for settlement. The date for the next hearing of

TABLE I—RECORD OF ELECTRIC RAILWAY RECEIVERSHIPS

Year	Number of Companies	Miles of Single Track Involved	Outstanding Stock	Securities Bonds
1909	22	558.00	$29,962,200	$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	221,259,354	312,915,104
1920(b)	19(b)	1,065.31	28,758,455	72,283,575
1921	16	917.82	31,150,550	34,613,200

(a) No data available.
(b) Corrected by adding to figures shown last year, data for three companies: Bryan (Tex.) & Central Texas Interurban Ry.; Cumberland Ry. & Pwr. Co. of N. C.; and the Rock Island Southern Ry., which went into receivership in 1920, but were omitted through failure to receive information.
(c) Corrected by adding to figures shown last year, data for Scranton (Pa.) and Binghamton Ry., which was foreclosed in 1919, but omitted from list through failure to receive information.
(d) Corrected by adding to figures shown last year, data for two companies, Bay State St. Ry. (Newport Division); and the Jackson (Miss.) Lt. & Traction Co., both foreclosed in 1920, but omitted from list through failure to receive information.

TABLE II—RECORD OF ELECTRIC RAILWAY FORECLOSURE SALES

Year	Number of Companies	Miles of Track Involved	Outstanding Stock	Securities Bonds	Receiver's Certificates
1909	21	488.00	$22,265,700	$21,174,000	(a)
1910	22	724.36	19,106,613	26,374,075	(a)
1911	25	660.72	91,354,800	115,092,750	(a)
1912	18	267.18	14,197,300	10,685,250	(a)
1913	17	302.28	15,243,700	19,094,500	(a)
1914	11	181.26	26,239,700	44,094,241	(a)
1915	19	308.31	30,508,817	16,759,997	(a)
1916	19	430.14	13,895,400	22,702,300	(a)
1917	26	745.19	27,281,900	27,313,045	(a)
1918	23	524.22	37,740,325	20,149,384	(a)
1919(c)	29(c)	2,675.48	89,893,400	79,836,738	$42,300
1920(d)	13(d)	259.90	7,782,400	11,227,328	52,000
1921	13	777.97	33,642,255	30,863,576	5,000

TABLE III—ELECTRIC RAILWAY RECEIVERSHIPS—1921
(Listed alphabetically by States)

	Miles
Concord, Maynard & Hudson St. Ry. (Greenfield, Mass.)	18.15
Connecticut Valley St. Ry. (Greenfield, Mass.)	47.05
Northern Massachusetts St. Ry. (Greenfield, Mass.)	44.09
New York & North Shore Trac. Co. (Roslyn, N. Y.)	38.12
Houghton County Traction Co. (Mich.)	32.15
Saginaw-Bay City Railway (Mich.)	64.22
Maumee Valley Ry. & Lt. Co. (Toledo, Ohio)	23.21
Ohio Electric Ry. Co. (Springfield, O.)	82.90
Columbus, Newark & Zanesville Elec. Ry. Co. (b)	95.85
Indiana, Columbus & Eastern Trac. Co.(b)	257.20
Fort Wayne, Van Wert & Lima Trac. Co. (b)	61.63
Toledo (O.) & Western R. R. Co.	84.08
Ephrata & Lebanon (Pa.) St. Ry.	24.00
So. Carolina Lt., Power & Ry. (Spartansburg)	21.00
Austin (Tex.) St. Ry.	22.67
Standard Traction Co. (Dallas, Tex.) (c)	1.50
Total for 1921 (sixteen companies)	917.82

(a) Data not available.
(b) Subsidiary of Ohio Electric Ry. Co., now operated under separate receiver.
(c) Receiver has leased it to Dallas Railway Co.

(Note) Three companies in receivership in 1920 were omitted from last year's list, because of failure to receive data; they were: Bryan & Central Texas Interurban, Cumberland (N. C.) Ry. Pwr. Co., Rock Island (Ill.) Southern Ry.

TABLE IV—ABANDONMENTS—ENTIRE—1921
(Includes only companies whose entire traction property has been dismantled or permanently abandoned and not likely to resume operations)

	Miles	Stock	Bonds
Thane (Alaska) Perseverance Ry.	5.25	(a)	(a)
Douglas (Ariz.) Traction & Lt. Co.	(a)	(a)	(a)
Washington (D.C.) Great Falls Ry. & Pwr. Co.	(a)	(-)	(-)
Plymouth & Shelby Traction Co. (Norwalk, O.)	6.97	$200,000	$200,000
Sandusky, Norwalk (O.) & Mansfield Elec. Ry.	33.00	600,000	600,000
Bartlesville (Okla.) Interurban Co.	10.10	(a)	(a)
Total for 1921 (6 companies)	56.32	800,000	800,000

(a) Data not available.

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the petition for a receiver for the company has been set for Jan. 30. Recent statements by responsible officials of the Interborough Rapid Transit Company seem to indicate that they expect to be able to meet obligations during the coming year without the necessity of the intervention of a receiver. Several of the companies that are still in receivership are now reporting more satisfactory earnings and there is every indication that the current year will see the discharge of many receivers. The readjustment of fares to a reasonable and profitable basis, the reductions in prices and wages, and the cutting off of unprofitable lines, or parts of lines, are factors which are all helping to bring about a better and more healthy financial condition of the industry. Plans for the reorganization of the Pittsburgh and New Orleans properties are said to be approaching completion without likelihood of foreclosure. It is especially interesting to note that in at least three cases during the year just past, receivers have been discharged without foreclosure or reorganization of the companies involved owing to their improved financial condition. These were the Atlantic City & Shore Railroad Company, Atlantic City, N. J.; the Denver (Col.) In-

TABLE V— ELECTRIC RAILWAY RECEIVERSHIPS AND FORECLOSURES AS OF DEC. 31, 1921

	Year of Receivership	Miles of Single Track Involved	Outstanding Securities: Capital Stock	Outstanding Securities: Funded Debt	Outstanding Securities: Receivers' Certificates
New England District					
Connecticut					
Danbury (Ct.) & Bethel St. Ry.	1917	13.00	$320,000	$588,500	$85,000
Hartford & Springfield St. Ry. (Warehouse Pt.)	1918	48.00	785,000	961,000	None
Shore Line Electric Ry. (c)	1919	67.20	1,000,000	6,700,000	None
Maine					
Atlantic Shore Ry. (Kennebunk)	1915	49.93	1,000,000	1,746,250	None
Massachusetts					
Brockton & Plymouth (Mass.) St. Ry.	1919	22.00	250,000	260,000	None
Concord, Maynard & Hudson St. Ry. (Greenfield)	1921	18.15	235,000	230,000	None
Connecticut Valley St. Ry. (Greenfield)	1921	47.05	620,000	580,000	None
Northern Massachusetts St. Ry. (Greenfield)	1921	44.09	500,000	500,000	None
New Hampshire					
Portsmouth, Dover (N.H.) & York St. Ry.	1917	42.33	(d)	707,000	20,000
Rhode Island					
Bay State St. Ry. (Newport Div.) (bb)	1917	22.20	(b)	996,800	None
Rhode Island Co. (Providence) (a)	1919	101.15	9,685,500	1,662,000	None
United Traction & Electric Co. (a)	1919	289.93	8,000,000	9,000,000	None
Rhode Island Suburban Ry. (Providence) (a)	1920	74.70	5,000,000	(f) 4,998,200	None
Vermont					
Springfield (Vt.) Elec. Ry.	1918	9.00	100,800	100,000	5,000
Barre & Montpelier (Vt.) Traction & Pwr. Co.	1920	9.75	(u)	(g) 340,771	None
Summary					
Total 1/1/21	12 cos.	760.65	28,478,300	29,415,800	102,323
Net changes and corrections	*1 co.*	*33.66*	*2,337,000*	*2,352,079*	7,677
Receiverships added during 1921	3 cos.	109.29	1,355,000	1,310,000	None
Less Properties sold or reorganized during 1921	*5 cos.*	*165.78*	*22,685,500*	*15,660,200*	None
Net receiverships 12/31/21	11 cos.	370.50	4,810,800	12,713,521	110,000
North of the Ohio and East of the Mississippi River					
Illinois					
Chicago (Ill.) & Oak Park Elevated R.R.	1911	22.66	$10,000,000	$5,595,000	$1,758,000
Chicago, Aurora (Ill.) & De Kalb R.R. (h)	1916	30.20	950,000	427,500	None
Aurora, Elgin & Chicago R.R. (Wheaton) (h)	1919	168.00	6,200,000	8,371,000	None
Alton (Ill.) Granite & St. Louis Traction Co.	1920	62.00	3,189,000	3,000,000	None
Rock Island (Ill.) Southern Ry. (a)	1920	(l) 46.00	2,944,800	3,343,000	None
Indiana					
Winona Interurban Ry. Co. (Warsaw)	1916	70.00	750,000	2,343,700	None
Beech Grove (Ind.) Traction Co.	1917	3.90	150,000	100,000	None
Vincennes (Ind.) Traction Co.	1919	7.50	350,000	235,000	None
Michigan					
Marquette City & Presque Isle (Mich.) Ry. (h)	1912	6.00	200,000	100,000	None
Saginaw-Bay City Ry.	1921	64.22	2,600,000	2,063,000	None
Houghton County Traction Co. (Houghton)	1921	32.15	957,200	677,000	None
New Jersey					
North Jersey Rapid Transit Co. (Hohokus)	1912	18.00	800,000	800,000	None
Atlantic City (N.J.) & Shore R.R. Co. (b)	1915	49.89	1,000,000	950,000	None
Monmouth County Elec. Co. (Red Bank)	1916	18.50	350,000	500,000	17.500
New York					
Second Ave. R.R. (New York City)	1908	30.02	1,862,000	5,720,000	3,140,000
Rochester (N.Y.) Corning & Elmira Trac. Co. (j)	1912	(j) 6.00	271,000	1,000,000	None
Buffalo (N.Y.) & Lackawanna Trac. Co.	1918	8.80	55,000	1,000,000	None
Hornell (N.Y.) Traction Co.	1917	10.90	117,900	150,000	25,000
Manhattan & Queens Trac. Co. (Long Isl. City)	1917	21.20	(i) 20,000	(i) 2,090,000	None
Binghamton (N.Y.) Ry. Co.	1918	49.75	978,995	2,410,000	40,000
Buffalo (N.Y.) & Depew Ry.	1918	13.59	305,000	350,000	60,000
Penn Yan (N.Y.) & Lake Shore Ry.	1918	8.50	94,000	100,000	None
Brooklyn Rapid Transit Co. (e)	1918	(Holding Co.)	74,455,159	68,144,000	18,000,000
New York Consolidated Ry. (e)	1918	141.68	683,184	22,967,000	None
New York Municipal Ry. Corp. (e)	1918	67.82	.....	2,265,000	.....
Surface Lines					
Brooklyn Heights R. R. (e)	1919	36.60	.....	250,000	None
Brooklyn, Queens County & Suburban R. R. (e)	1919	61.92	.....	4,566,000	34,353
Nassau Electric Ry. (e)	1919	144.39	105,225	13,588,928	320,773
Coney Island & Brooklyn Ry. (e)	1919	59.53	297,400	5,480,000	None
Interborough Consolidated Corp. (e)	1919	(Holding Co.)	50,403,634	63,808,000	None
New York (N. Y.) Railways Co. (e)	1919	(k) 97.72	(k) 6,055,202	69,081,685	None
Richmond Lt. & R.R. Co. (Staten Island)	1920	32.05	(n) 1,932,000	(n) 1,482,000	None
Staten Island (N.Y.) Midland Ry. Co.	1920	28.68	1,000,000	1,000,000	None
Western New York & Penn. Trac. Co. (Olean) (a)	1920	100.00	1,599,355	2,492,000	None
Westchester St. R.R. of White Plains	1920	21.60	700,000	168,000	17,400
Shore Line Elec. R.R. (White Plains)	1920	1.46	50,000	None	None
New York & North Shore Trac. Co.	1921	38.12	979,350	770,000	11,000
Ohio					
Sandusky, Norwalk (O.) & Mansfield Elec. Ry. (a)	1912	33.00	600,000	600,000	None
Cincinnati (O.) Lawrenceburg & Aurora Elec. St. Ry.	1913	31.89	808,900	750,000	None
Interurban Ry. & Terminal Co. (Cincinnati) (h)	1914	41.03	3,500,000	1,650,000	49,000
Plymouth & Shelby Trac. Co. (Norwalk) (a)	1917	6.97	200,000	200,000	None
Ohio River Elec. Ry. & Pwr. Co. (Pomeroy)	1919	12.70	300,000	315,000	None
Cleveland (O.) Alliance & Mahoning Valley R.R.	1920	46.00	1,100,000	1,100,000	10,000
Ashtabula (O.) Rapid Transit Co.	1920	5.50	500,000	382,000	7,500
Ohio Electric Ry. (Springfield) (o)	1921	82.90	11,000,000	7,254,200	None
Columbus, Newark & Zanesville Elec. Ry.	1921	95.85	2 025,000	4,704,000	None
Fort Wayne, Van Wert & Lima Trac. Co.	1921	257.20	4,025,000	7,900,000	None
Indiana, Columbus & Eastern Trac. Co.	1921	61.63	1,000,000	1,470,000	None
Maumee Valley Railway & Lt. Co. (Toledo)	1921	23.21	1,000,000	800,000	None
Toledo & Western RR. Co. (Sylvania)	1921	84.08	2,000,000	2,000,000	None

(Continued on next page)

NOTES

(a) Sold at foreclosure or reorganized during 1921.
(aa) Sold at foreclosure in 1920—information not received in time for last year's tabulation.
(aaa) Sold at foreclosure in 1919—carried in table to date because information not heretofore available.
(b) Receiver discharged in 1921 without foreclosure.
(bb) Operation by receiver was terminated in 1920, when Newport County Electric was formed to take over lease from receivers of former Bay State Street Ry.
(c) Shore Line Electric Railway is being dismembered and reorganized under receiver.
(d) Included in that of Atlantic Shore Railway.
(e) Securities shown are shown as recently tabulated by New York Transit Commission as being outstanding and in the hands of the public. See *Electric Railway Journal*, Dec. 17, 1921.
(f) Includes bonds of certain subsidiary lines involved.
(g) Receiver estimates value of railway share of securities at $340,771.
(h) Included in last year's report. No information available as to present status.
(i) No bonds issued. Cost of construction carried by temporary notes.
(j) This company is reported as having had right of way, but no track built. No further information available.
(k) Excludes track and securities of formerly controlled companies, which have been returned to their owners.
(l) Part electric, part steam operation.
(m) Road under construction by new company.
(n) Figures cover only proportion of securities represented by railway property. Estimated at 67.4% of total.
(o) The three subsidiaries of the Ohio Electric Ry., are in separate receivership and are shown separately, directly following.
(p) Figures cover only proportion of securities represented by railway property. Estimated at 57.2% of total.
(q) Figures cover total combined property—railway value cannot be separated.
(r) Includes notes and bank loans.
(s) Receivership limited to Chattanooga railway lines only.
(t) Figure given is for railway lines only.
(u) But three miles of road is electrified, balance operated by steam. Figures are given for the entire road.
(v) Stock has no par value—nominal value given.
(w) No information available.

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terurban Railroad Company, and the Caldwell (Idaho) Traction Company.

The record of foreclosures during the year 1921 includes thirteen companies, the same in number as the previous year. Although the total securities involved in the foreclosures is considerably larger than in the preceding year, the greatest part of them were confined to the Rhode Island Company and its subsidiaries. This company has been in receivership since 1919, and the receivership has been disposed of finally through the formation of a new company which has taken over the old properties of the company through the foreclosure sale.

There have been several complete reorganizations of large companies consummated during the year 1921 without the intervention of a receiver, notably the United Railroads of San Francisco, now organized and operating with a reduced capitalization as the Market Street Railway.

In order to permit comparisons with previous years the statistics have been presented herewith in the usual fashion. Tables I and II give record of electric railway receiverships and foreclosures by years since this work was first begun in 1909. The figures given in these first two tables are not cumulative but show the new companies involved in each individual year. The figures have been corrected, in line with information received since they were published a year ago, consequently in comparing them with last year's issue, attention should be given to the footnotes. The outstanding securities of the Brooklyn Rapid Transit Company and its subsidiaries, the Interborough Consolidated Corporation and the New York Railways Company, have been revised and corrected to correspond with the tabulations recently published by the New York Transit Commission. They now represent the actual net amounts of stock, bonds and receivers' certificates held by the public, eliminating, as

TABLE V— ELECTRIC RAILWAY RECEIVERSHIPS AND FORECLOSURES AS OF DEC. 31, 1921

	Year of Receivership	Miles of Single Track Involved	Outstanding Securities — Capital Stock	Funded Debt	Receivers' Certificates
Pennsylvania					
Philadelphia & Easton Elec. Ry. (Doylestown) (a)	1912	31.00	$612,600	$911,000	None
Sunbury (Pa.) & Susquehanna Ry.(h)	1913	9.20	600,000	640,000	None
North Branch Transit Co. (Bloomsburg)	1915	30.00	500,000	532,500	None
Buffalo & Lake Erie Traction Co. (Erie)	1915	168.00	7,500,000	7,066,000	920,000
Pittsburgh (Pa.) Railways	1918	605.25	21,726,750	41,579,500	None
Scranton (Pa.) & Binghamton Ry. (aaa)	1918	50.00	6,000,000	4,100,000	None
Philadelphia (Pa.) Rys. Co.	1919	16.00	400,000	400,000	None
Northampton Traction Co. (Easton) (a)	1919	21.00	500,000	1,009,000	5,000
Northampton, Easton (Pa.) & Wash. Trac. Co.	1919	17.80	1,250,000	739,000	None
Cleveland & Erie Ry. (Girard)	1920	30.00	300,000	1,000,000	None
Ephrata & Lebanon St. Ry. Co.	1921	24.00	189,000	250,000	None
Summary					
Total 1/1/21	49 cos.	2,556.52	144,387,360	297,348,035	23,983,300
Net changes and connections	*2 cos.*	*56.21*	62,879,744	54,453,778	421,226
Receiverships added during 1921	10 cos.	763.36	25,775,550	27,888,200	11,000
Less those sold or reorganized during 1921	*6 cos.*	*237.97*	*6,156,755*	*8,555,000*	*5,000*
Net receiverships 12/31/21	51 cos.	3,025.70	226,585,899	371,135,013	24,410,526
South of the Ohio and East of the Mississippi River					
Alabama					
Birmingham (Ala.) Tidewater Ry.	1919	32.63	325,000	1,500,000	17,000
Birmingham (Ala.) Ry. Lt. & Power Co.	1919	154.40	(p) 4,230,000	(p) 8,820,000	489,060
Montgomery (Ala.) Lt. & Traction Co.	1919	38.00	(q) 2,000,000	(q) 1,430,000	(.) 250,000
North Alabama Traction Co. (Albany)	1919	7.63	75,000	225,000	None
Florida					
Jacksonville (Fla.) Traction Co.	1919	63.94	1,500,000	(r) 3,263,500	65,000
Pensacola (Fla.) Electric Co.	1920	22.70	(q) 1,100,000	(q) 1,762,900	( ) 25,000
Georgia					
City & Suburban Ry. Co. (Brunswick) (a)	1919	9.50	100,000	194,000	None
Savannah (Ga.) Elec. Co. (a)	1919	57.72	(q) 3,500,000	(r) 6,074,376	None
Mississippi					
Jackson (Miss.) Lt. & Trac. Co. (aa)	1919	13.50	(q) 1,600,000	(q) 915,000	None
North Carolina					
Cumberland Ry. & Pwr. Co. (a)	1920	(m)	500,000	80,000	None
South Carolina					
So. Carolina Lt., Pwr. & Rys. Co. (Spartanburg)	1921	21.00	3,200,000	4,629,000	None
Tennessee					
Memphis (Tenn.) St. Ry.	1919	130.40	5,000,000	8,095,000	None
Chattanooga (Tenn.) Ry. & Lt. Co. (s)	1919	68.00	(q) 5,000,000	(t) 2,790,000	None
West Virginia					
Morgantown (W. Va.) & Wheeling Trac. Co. (u)	1916	(u) 27.00	345,000	500,000	214,000
Grafton (W. Va.) Lt. & Pwr. Co. (a)	1917	7.00	(t) 400,000	(t) 300,000	None
Summary					
Total 1/1/21	13 cos.	532.74	25,175,000	34,737,280	715,000
Net changes and corrections	....	86.18	*1,100,000*	297,496	345,060
Receiverships added during 1921	1 co.	21.00	3,200,000	4,629,000	.....
Less those sold or reorganized during 1921	*4 cos.*	*74.22*	*4,500,000*	*6,648,376*	.....
Net receiverships 12/31/21	10 cos.	565.70	22,775,000	33,015,400	1,060,060
West of the Mississippi River					
Arizona					
Tucson (Ariz.) Rapid Transit Co.	1919	4.35	500,000	114,800	None
Colorado					
Denver (Col.) & Interurban R.R. (b)	1918	44.43	101,500	1,079,000	None
Denver (Col.) Tramway Co.	1920	225.51	6,156,300	17,663,585	None
Idaho					
Caldwell (Id.) Traction Co. (b)	1920	11.40	250,000	None	None
Iowa					
Des Moines (Ia.) City Ry. Co.	1918	94.00	1,305,000	5,981,000	10,000
Kansas					
Southwestern Interurban Ry. (Winfield)	1919	25.00	150,000	None	None
Louisiana					
New Orleans (La.) Ry. & Lt. Co.	1919	222.12	(q) 30,198,850	(q) 38,361,200	(.) 1,180,000
Minnesota					
St. Paul Southern Electric Ry. Co. (Hastings) (h)	1918	17.54	658,225	425,400	40,000
Missouri					
Kansas City (Mo.) Outer Belt Elec R.R. (h)	1912	(j)	None	1,298,000	100,000
Kansas City, Ozark & Southern Ry. (Ava) (h)	1913	15.00	300,000	None	.....
Kansas City (Mo.), Lawrence & Topeka R.R.	1919	12.00	250,000	400,000	None
United Railways Co. of St. Louis, Mo.	1919	460.72	41,296,000	50,690,000	4,200,000
Missouri Electric R.R. (St. Louis)	1919	18.96	1,000,000	700,000	None
Kansas City (Mo.) Railways	1920	314.68	(v) 100,000	30,272,128	None
Oregon					
Southern Oregon Traction Co. (Medford) (h)	1918	8.19	150,000	150,000	.....
Texas					
Corpus Christi (Tex.) Ry. & Lt. Co.	1919	9.75	.....	(q) 1,694,507	14,539
Bryan (Tex.) & College Interurban Ry. (h)	1920	7.75	(w)	(w)	(w)
Bryan & Central Texas Interurban	1920	27.20	(w)	(w)	(w)
Austin (Tex.) St. Ry.	1921	22.67	810,000	786,000	None
Standard Traction Co. (Dallas)	1921	1.50	10,000		
Summary					
Total 1/1/21	17 cos.	1,480.34	82,416,275	152,579,082	4,091,539
Net changes and corrections	*1 co.*	*17.67*	*851,900*	*4,828,462*	1,453,000
Receiverships added during 1921	2 cos.	24.17	820,000	786,000	.....
Less than sold or reorganized during 1921	None	.....	.....	.....	.....
Net receiverships 12/31/21	18 cos.	1,486.94	82,884,375	148,536,620	5,544,539
RECAPITULATION					
Total 1/1/21	91 cos.	5,330.25	280,456,935	514,080,197	28,892,162
Net changes and connections	*4 cos.*	*21.26*	59,090,844	47,570,733	2,226,963
Receiverships added during 1921	16 cos.	917.82	31,150,550	34,613,200	11,000
Less those sold or reorganized during 1921	*13 cos.*	*777.97*	*33,642,255*	*30,863,576*	*5,000*
Net receiverships 12/31/21	90 cos.	5,448.84	337,056,074	565,400,554	31,125,125

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far as possible, inter-corporate holdings, which are duplicated by other securities. Complete statistics of the outstanding securities of the various companies in Greater New York, as tabulated by the New York Transit Commission, were published in the Dec. 17 issue of the ELECTRIC RAILWAY JOURNAL.

TABLE VI—ABANDONMENTS—PARTIAL—1921

(Includes all pieces of track, sidings, yards, etc., permanently abandoned—Companies arranged alphabetically by States)

	Miles
Monterey (Cal.) & Pacific Grove Ry.	1.00
Peninsula Railway (San Jose, Cal.)	0.46
San Francisco—Oakland (Cal.) Term. Rys.	0.52
Denver (Colo.) Tramways	2.22
Connecticut Co. (New Haven)	0.62
Shore Line Elec. Ry. (Norwich, Conn.)	15.77
Washington (D. C.) Ry. & Elec. Co.	2.47
Georgia Ry. & Pwr. Co. (Atlanta)	0.47
Chicago (Ill.) Surface Lines	0.17
Chicago (Ill.) & Interurban Trac. Co	0.95
Indiana Service Corp. (Fort Wayne)	6.63
Union Traction Co. of Indiana (Anderson)	2.66
Tri-City Ry. Co. of Iowa (Davenport)	2.02
Cumberland County Pwr. & Lt. Co. (Portland, Me.)	1.10
United Rys. & Elec. Co. (Baltimore, Md.)	0.24
Berkshire St. Ry. (Pittsfield, Mass.)	6.50
Boston (Mass.) Elevated Ry.	1.90
Eastern Massachusetts St. Ry. (Boston)	12.10
Massachusetts Northeastern St. Ry. (Haverhill)	1.65
Milford (Mass.) & Uxbridge St. Ry.	4.00
Union St. Ry. (New Bedford, Mass.)	0.14
St. Cloud (Minn.) Public Service Co.	0.25
City Light & Trac. Co. (Sedalia, Mo.)	1.00
Kansas City (Mo.) Lawrenceburg & Topeka Electric R.R.	0.05
Missouri Elec. R.R. (St. Louis)	0.14
St. Joseph (Mo.) Ry., Lt., Heat & Pwr. Co.	0.33
United Railways of St. Louis	0.02
Butte (Mont.) Elec. Ry.	0.50
Lincoln (Neb.) Traction Co.	2.50
Manchester (N. H.) St. Ry.	0.02
Manchester (N. H.) & Derry St. Ry.	0.05
Bridgeton (N. J.) & Millville Trac. Co.	0.42
Millville (N. J.) Traction Co.	0.84
Brooklyn (N. Y.) Heights R.R.	0.09
International Ry. Co. (Buffalo, N. Y.)	0.27
New York State Rys. (Syracuse Lines)	0.21
Orange County Traction Co. (Newburgh, N. Y.)	0.50
Syracuse (N. Y.) & Suburban R.R.	1.11
Westchester St. R.R. (White Plains, N. Y.)	1.50
Durham (N. C.) Traction Co.	0.19
Cincinnati (O.) Traction Co.	1.58
Columbus (O.) Ry. Pwr. & Lt. Co.	0.19
Community Traction Co. (Toledo, O.)	2.79
Dayton (O.) Springfield & Xenia Southern Ry.	2.00
Southeastern-Ohio Ry. (Zanesville)	1.00
Guthrie (Okla.) Ry.	1.00
Northeast Oklahoma R.R. (Miami, Okla.)	0.66
Portland (Ore.) Ry., Lt. & Pwr.	0.60
Beaver Valley Trac. Co. (New Brighton, Pa.)	0.81
Buffalo & Lake Erie Trac. Co. (Erie, Pa.)	0.57
Center & Clearfield Ry. (Philipsburg, Pa.)	0.50
Citizens Traction Co. (Oil City, Pa.)	0.54
Conestoga Traction Co. (Lancaster, Pa.)	0.03
Cumberland Ry. (Carlisle, Pa.)	15.00
Danville (Pa.) & Sunbury Transit Co.	0.50
Easton (Pa.) Transit Co.	7.27
Northwestern Pennsylvania Ry. (Erie, Pa.)	0.23
Philadelphia (Pa.) Rapid Transit Co.	0.94
United Electric Rys. Co. (Providence, R. I.)	0.62
Dallas (Tex.) Ry. Co.	1.31
Northern Texas Trac. Co. (Fort Worth)	0.11
Tarrant County Trac. Co. (Fort Worth, Tex.)	0.22
Richland-Ashland Ry. (Petersburg, Va.)	4.00
Puget Sound Elec. Ry. (Tacoma, Wash.)	0.13
Washington Water Pwr. Co. (Spokane, Wash.)	1.77
Yakima (Wash.) Valley Transp. Co.	0.72
Morgantown (W. Va.) & Wheeling Ry. (entire line)	27.00
Milwaukee (Wisc.) Elec. Ry. & Lt. Co.	2.53
British Columbia Elec. Ry. (Victoria, Can.)	0.40
Montreal (P. Q., Canada) Tramways Co.	0.62
Oshawa (Ont., Canada) Ry.	0.42
Total for 1921 (71 companies)	149.61

TABLE VII—SUSPENSIONS OF SERVICE 1921

(Includes miles of track on which companies have ceased to operate, but which have not been permanently abandoned or ripped up.)

	Miles
Eureka Trac. Co. (Eureka Springs, Ark)	4.00
Denver (Colo.) Tramways	25.00
Georgia Railway & Power Co.	1.45
New Orleans (La.) Ry. & Lt. Co.	0.77
Eastern Massachusetts St. Ry. Co.	19.68
Middlesex & Boston St. Ry. (Newton)	6.44
Manistee (Mich.) Ry. (entire line)	7.64
Third Avenue Railway (New York City)	0.20
Belt Line Railway	8.83
Mid-Crosstown Ry.	0.28
N. Y. City Interborough Ry.	3.30
N. Y., Westchester & Conn. Trac. Co.	0.01
Union Ry. of N. Y.	14.22
Westchester Electric R.R.	0.63
Yonkers R.R.	0.01
Syracuse (N. Y.) & Suburban R.R.	1.32
Community Traction Co. (Toledo, O.)	8.50
Southeastern-Ohio Ry. (Zznesville, O.)	1.00
Philadelphia Rapid Transit Co.	4.42
Washington Water Power Co. (Spokane)	7.76
Monongahela Valley Trac. Co. (Fairmont, W. Va.)	2.27
Total for 1921 (14 companies)	117.73

The cumulative totals of all companies in receivership as of Dec. 31, 1920, and Dec. 31, 1921, are shown at the foot of Table V. This tabulation includes all the individual companies shown in last year's Table V, with the exception of the ones which were sold at foreclosure or completely abandoned during 1920. These were stricken from the list. To the list have been added the sixteen new receiverships which occurred during the year 1921, also the three companies mentioned in the note under Table I which should have been included in 1920, but were omitted because the data were not received in time. Certain minor changes and corrections also have been made in the various figures to bring them up to date due to more recent information received. The totals have been adjusted to bring them up to date in each case, and to correspond with the 1921 summaries in Tables I and II. The three companies, mentioned above, which emerged from receivership in 1920 without foreclosure, have been deducted from the final total of roads in receivership as of Dec. 31, 1921 (Table V), through the medium of the "net changes and corrections."

The lists of abandonments of parts of lines, and suspensions of service, Tables VI and VII, are the same in general appearance and character as last year. Several of the partial abandonments reported have occurred on lines which were extended to Army camps during the war period. In some cases service has been resumed on other lines which had been previously reported as having suspended service or having been abandoned. In several cities service was suspended during the past year owing to jitney competition and was again resumed when this competition was eliminated. A notable instance is the case of the city of Des Moines, where there was no electric railway service for a period of nearly three months.

There have been no total abandonments of any roads of considerable size. The largest was the Sandusky, Norwalk & Mansfield Electric Railway, Norwalk, Ohio, which was sold for $60,000 and junked. The Fresno Interurban Railway reports that it has abandoned street railway passenger service, but is going to continue its freight business, therefore it has not been included in the list of abandonments.

Battle Waged Against Accidents

WITH the heading Efficiency—Safety—Courtesy, the *O. E. R. Bulletin* of the Ottawa (Ont.) Electric Railway is making a steady fight against accidents in Ottawa. The bulletin is issued only to the employees of the company and has in mind the promotion of good service. The publication serves as a means for frank discussion with the men of the problems and complaints that confront the officials.

Interests are not confined to local happenings nor to the problems of service maintenance only. In the November publication the problem of service-at-cost was presented in an article by Fielder Sanders, street railroad commissioner of Cleveland, Ohio.

The accident record of the Ottawa company is published each month, and for October the following statistics were given: Out of a total of ninety-three accidents, the company had no responsibility in seventy-six, doubtful responsibility in three, partial in one, and entire responsibility in thirteen. During September in ten cases the company was wholly at fault.

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Electric Railway Statistics for 1921

Number of Operating Companies Has Increased by Seven, While Trackage Has Decreased 150 Miles and the Number of New Cars Has Failed by 304 to Equal the Number of Those Which Have Retired

CORRESPONDING with the statistics of the miles of track and type of rolling stock of the electric railway companies in the United States which was published on page 47 of the ELECTRIC RAILWAY JOURNAL for Jan. 1, 1921, there has been compiled from the August, 1921, "Electric Railway Directory" of the McGraw-Hill Company a similar table. This information was gathered for publication in the directory in June and July of last year and may be said to represent fairly statistics of electric railways as of July 1, 1921.

As will be noticed, the country has been divided into the usual sections which combine all the states into the five natural groups or sections. This enables an easy comparison of the trend of the industry from a statistical standpoint, not only for the United States as a whole but also for each section of the country.

Every attempt has been made to prevent duplication in compiling these figures. Often there is difficulty in determining the correct figures due to the fact that they are submitted from two separate sources, such as the operating company and the holding company, and which for some unknown reason do not always agree.

The total number of operating companies in 1921 shows an increase over last year. This is due to the fact that in some cases railways which had temporarily suspended service have again begun operation, while in others former underlying companies that had been held under long term leases are now functioning as separate organizations. However, the mileage in 1921 does not equal the total of 1919. The mileage has been reported as the single-track equivalent for the city and interurban companies, but for the electrified steam railroads their route mileage has been used. The mileage operated in 1921 shows a decrease over 1920 of 150 miles, the totals being 47,555 miles in 1921 and 47,705 miles in 1920. This is largely due, it would seem, to the practice of companies abandoning track in unprofitable territory or to the entire closing down of certain routes in the hands of receivers.

Total pieces of rolling stock have changed very slightly from a year ago. In 1920 the total number of cars and locomotives was 106,688, while in 1921 there were 106,384. This is a decrease of 304, which seems to indicate that new purchases as a whole are approximately equivalent to the equipment retired. These figures do not include 121 passenger motor buses, which have either taken the place of existing routes or have been used on new routes as feeders for the already existing railway lines.

The passenger cars are divided into motor and trailer classes. In examining the totals, the number of passenger motor cars has increased 300, while that of the passenger trailers has fallen off slightly more than 200. As will be noticed, there are variations in the totals for "freight cars," both motor and trailer; "service cars" and "other cars." Many companies in the past have considered these terms as interchangeable, and each year some additional reports are clarified. However, as it is the primary purpose of the table to show electric railway conditions throughout the country with regard to electrically operated equipment, companies having a larger number of trailer freight cars in comparison to their passenger equipment have had the former rolling stock omitted. Under this ruling the freight cars reported by the Northwestern Pacific Railroad, amounting to 1,481 cars; the Fort Dodge, Des Moines & Southern Railroad, with 2,405 cars; the Butte, Anaconda & Pacific Railway, with 1,458, and the Norfolk & Western Railroad, with 14,593 cars, have been omitted. The same is also true in the case of 3,000 "other" cars of the Chicago Tunnel Company. At the same time there have been included 1,157 freight cars of the Pacific Electric Railway and 910 such cars of

STATISTICS OF ELECTRIC RAILWAY CARS AND TRACK IN THE UNITED STATES

State	No. of Companies Operating	Miles of Single Track	Passenger Cars		Electric Locomotives	Freight and Express Cars		Service Cars	Other Cars
			Motor	Trailer		Motor	Trailer		
ew England States:									
Connecticut...	7	1,562.42	1,739	52	108	60	8	289	1
Maine.....	14	528.07	457	12	8	36	77	81	40
Massachusetts.	34	2,768.29	5,981	48	12	63	10	903	87
New Hampshire	11	249.90	299	....	1	1	....	22	14
Rhode Island..	4	399.97	1,055	30	3	31	41	167	5
Vermont.....	8	103.33	126	4	4	11	1	12	3
Total.....	78	5,611.98	9,657	146	136	202	137	1,474	150
Eastern States:									
Delaware.....	2	158.80	225	98	....	4	1	28	4
D. of Columbia	7	388.16	1,094	29	7	25	52	36	24
Maryland.....	11	705.00	2,052	59	11	5	49	29	38
New Jersey....	24	1,582.63	3,154	2	2	22	5	321	43
New York.....	91	5,616.30	18,351	1,979	125	132	38	1,275	942
Pennsylvania..	105	4,517.03	7,748	190	4	143	102	707	950
Virginia.....	13	442.88	863	64	3	16	32	50	5
W. Virginia....	17	692.94	618	24	15	35	22	50	45
Total.....	270	14,103.74	34,105	2,445	167	382	301	2,496	2,051
Central States:									
Illinois.....	55	3,614.38	5,951	773	59	22	2,005	125	281
Indiana.....	28	2,452.71	1,997	61	12	43	458	134	221
Iowa.....	24	963.32	780	56	39	47	377	76	164
Kentucky.....	7	455.59	997	22	....	16	11	63	8
Michigan.....	24	1,800.72	2,799	81	17	150	354	112	329
Minnesota....	13	757.08	1,257	14	9	45	....	17	97
Missouri.....	22	1,158.03	2,503	257	4	18	20	331	57
Ohio.....	60	4,214.34	5,089	594	32	192	342	538	259
Wisconsin.....	16	761.39	939	128	7	12	27	326	27
Total.....	249	16,177.56	22,312	1,986	179	545	3,594	1,722	1,443
Southern States:									
Alabama.....	12	360.98	446	42	3	4	24	27	200
Arkansas.....	9	128.30	243	10	....	....	4	10	24
Florida.....	8	196.59	309	11	....	9	19	22	....
Georgia.....	11	478.71	674	46	1	5	19	49	31
Louisiana.....	8	309.20	666	47	....	8	1	108	2
Mississippi....	7	94.78	110	4	2	....	....	1	20
North Carolina	11	300.42	323	16	18	9	178	14	9
South Carolina	4	148.65	186	28	....	1	....	3	18
Tennessee.....	11	449.59	739	100	1	2	2	47	41
Total.....	81	2,467.22	3,696	304	25	38	247	281	345
Western States:									
Arizona.....	4	54.44	52	1	....	....	....	3	....
California.....	36	3,251.74	3,719	329	73	44	1,648	475	283
Colorado.....	12	468.91	421	147	8	11	165	57	33
Idaho.....	3	102.20	35	....	....	25	....	8	....
Kansas.....	14	514.69	369	39	2	17	95	27	26
Montana.....	7	846.02	119	26	89	....	5	15	....
Nebraska.....	5	256.00	610	10	1	....	....	3	50
Nevada.....	2	10.80	9	....	....	....	....	....	....
New Mexico...	2	10.95	16	....	....	....	....	....	....
North Dakota..	4	27.31	51	23	....	....	....	8	....
Oklahoma.....	17	369.53	320	20	7	3	96	22	9
Oregon.....	8	694.13	716	103	23	....	459	166	35
South Dakota..	3	25.85	33	4	....	....	....	2	2
Texas.....	21	985.95	1,470	122	1	21	12	96	41
Utah.....	5	470.50	216	42	21	3	212	49	211
Washington...	15	1,083.71	1,097	70	28	33	741	77	71
Wyoming.....	2	22.00	11	1	....	....	....	1	4
Total.....	160	9,194.73	9,264	937	253	157	3,433	1,009	765
Total U.S., 1921	838	47,555.23	79,034	5,818	760	1,324	7,712	6,982	4,754
Total U.S., 1920	831	47,704.92	78,722	6,027	751	1,215	7,441	5,723	6,809

Total number of cars and locomotives in 1921, 106,384; in 1920, 106,688

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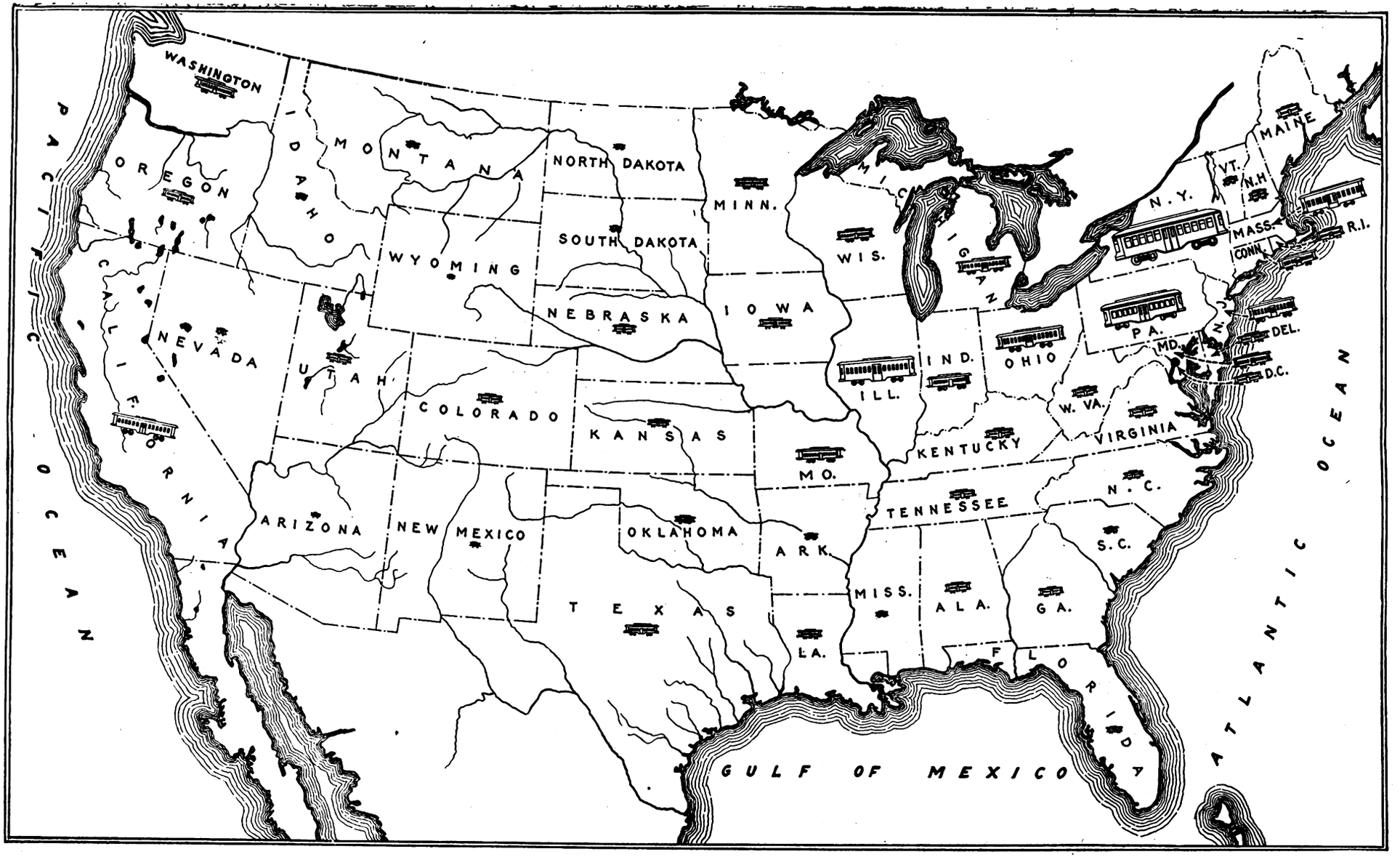

Graphical Presentation of Rolling Stock as Operated in the Several States During 1921

ON THIS map of the United States is graphically presented the information on rolling stock in the table on the opposite page. Each car shown has an area proportional to the amount of rolling stock in operation in that state. The number of cars in each state is probably a more accurate index of the size of the industry in that state than the track mileage, of which a map similar to this one was printed in the issue of the ELECTRIC RAILWAY JOURNAL for July 10, 1920. More than 20 per cent of the total rolling stock in the country operates in New York State. Pennsylvania, its nearest competitor, has less than half that percentage.

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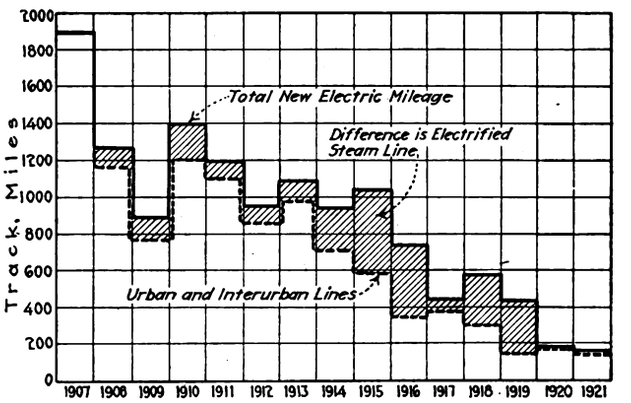
the Illinois Traction System, which are primarily electric railway systems that cover a large territory.

Corresponding with our policy of last year, an attempt has been made still further to unscramble the column "other" cars and allocate them according to their proper classifications. In 1919 we reported 10,144 "other" cars, in 1920 this was reduced to 6,899 and this year it is only 4,754 cars. While this is a decrease of 5,360 cars in two years, they have not all been discarded, but have been reported so as to be properly classified. It seems reasonable to suppose that heretofore "other" cars had included all types of equipment other than that engaged in passenger transport service. For this reason, then, as this class is more clearly detailed it is but natural to expect the numbers of service, freight and express cars will be increased.

Track Extended and Reconstructed in 1921

Amount of New Track Built During Past Year Remained About the Same as for 1919 and 1920—Track Reconstruction Has Taken a Sudden Jump and More Miles Have Been Rebuilt than Any Year Previously Recorded

A COMPARISON of the statistics of track built and reconstructed for the year 1921 as given in the accompanying tables indicates that electric railways have been unable to finance new construction, but that a large amount of reconstruction has been found necessary. The track extensions built by electric railways during the past year still continue at the low level that has existed since 1916. The mileage reported for urban and interurban track extensions during 1921 for the United States and Canada is 147.10. This is divided 108.15 miles for city lines and 38.95 miles for interurban lines. Practically all this is made up of spurs and short extensions and few additions of any considerable extent were carried out due to the extremely difficult conditions under which railways were working. The city of Detroit stands out as the only place where new construction was undertaken in any great amount. There 46.09 miles of new track were completed.



MILES OF TRACK BUILT BY YEARS

Electrification of steam lines was also at a standstill during the past year. The extensions reported amount to but 8.08 miles, which is nearly the same as for 1920.

New England District

	Extensions, Miles		Rebuilt, Miles	
Connecticut	City	Interurban	City	Interurban
The Connecticut Co. (New Haven)	0.40	0.05	12.81	5.02
Hartford & Springfield St. Ry.	.....	.....	1.10	....
Waterbury & Milldale Tramway	.....	.....	1.00	....
Maine				
Androscoggin Electric Co.	.....	.....	.....	3.00
Cumberland County Pwr. & Light Co.	.....	.....	2.29	1.12
Massachusetts				
Berkshire Street Ry.	.....	.....	1.66	0.33
Boston Elevated	0.80	.....	25.70	....
Boston & Worcester St. Ry.	.....	.....	0.57	....
Brockton & Plymouth St. Ry.	.....	.....	1.00	....
Connecticut Valley St. Ry.	.....	.....	0.50	....
Eastern Massachusetts St. Ry.	.....	.....	5.30	4.40
Holyoke Street Railway	.....	.....	0.86	1.11
Middlesex & Boston St. Ry.	.....	.....	0.44	1.64
Milford & Uxbridge St. Ry.	.....	.....	.....	4.00
Northern Massachusetts St. Ry.	.....	.....	2.00	....
Springfield Street Ry.	.....	.....	1.06	0.73
Union Street Ry.	0.01	4.96	0.47	0.05
Worcester Consolidated St. Ry.	0.34	.....	3.04	0.44
Rhode Island				
United Electric Rwys.	.....	.....	3.52	....
Vermont				
Barre & Montpelier Trac. & Pwr. Co.	.....	.....	0.10	....
Total	1.55	5.01	63.42	21.84

North of the Ohio and East of the Mississippi River

District of Columbia				
The Capital Traction Co.	.....	.....	3.07	....
Washington & Old Dominion Ry.	.....	.....	.....	1.00
Washington Railway & Elec. Co.	.....	.....	5.50	....
Delaware				
Wilmington & Philadelphia Trac. Co.	.....	.....	2.76	....
Illinois				
Alton, Granite & St. Louis Trac. Co.	.....	.....	1.76	....
Bloomington & Normal Ry. & Lt. Co.	.....	.....	1.00	....
Calumet & So. Chicago Ry.	.....	.....	0.05	....
Chicago City Ry.	0.01	.....	0.22	....
Chicago & Interurban Trac. Co.	.....	.....	1.00	15.00
Chicago Railways	1.80	.....	2.40	....
Coal Belt Elec. Ry.	.....	.....	0.34	....
East St. Louis Ry.	.....	.....	2.15	....
East St. Louis & Suburban Ry.	.....	.....	0.52	....
Evanston Ry. Co.	.....	.....	2.60	....
Illinois Central Elec. Ry.	.....	.....	0.11	....
North Kankakee El. Light & Ry. Co.	.....	.....	2.00	....
Peoria Ry. Co.	.....	.....	1.31	....
Peoria Ry. Terminal Co.	.....	.....	1.60	....
Sterling, Dixon & Eastern El. Ry.	.....	.....	1.00	....
St. Louis & Belleville El. Ry.	.....	.....	0.50	....
Indiana				
Chicago, South Bend & No. Ind.	.....	.....	0.71	....
Gary Street Ry.	.....	.....	3.75	....
Hammond, Whiting & E. Chicago Ry.	.....	.....	0.23	....
Indiana Service Corporation	2.16	0.15	1.32	0.45
Southern Indiana Gas & Electric Co.	.....	.....	0.75	....
Southern Michigan Ry.	.....	.....	0.25	....
Terre Haute Traction & Lt. Co.	.....	.....	1.00	....
Union Traction Co. of Indiana	0.27	.....	0.90	....
Maryland				
Baltimore & Bel-A r Elec. Ry.	.....	0.50	.....	....
United Rwys. & Elec. Co.	1.77	.....	15.24	....
Michigan				
Benton Harbor-St. Joe Ry. & Lt. Co.	0.50	.....	1.50	....
City of Detroit Dept. of Street Rwys.	46.09	.....	.....	....
Grand Rapids Ry.	0.31	.....	1.17	....
Ironwood & Bessemer Ry. & Lt. Co.	0.20	.....	.....	....
New Jersey				
Burlington County Transit Co.	.....	.....	2.50	....
Jersey Central Traction Co.	.....	.....	0.50	....
Monmouth County Electric Co.	.....	.....	0.15	....
Public Service Ry.	.....	.....	17.68	....
New York				
Black River Traction Co.	.....	.....	0.24	....
Brooklyn City R.R.	.....	.....	4.75	....
Eighth Ave. R.R.	.....	.....	1.00	....
Elmira Water, Light & R.R. Co.	.....	.....	0.80	....
Empire State R.R.	.....	.....	0.71	....
Fonda, Johnstown & Gloversville R.R.	.....	.....	0.34	....
International Ry.	.....	.....	14.44	....
New York State Rwys.	0.06	.....	2.79	....
Ninth Ave. R.R.	.....	.....	0.75	....
Port Jervis Traction Co.	.....	.....	0.25	....
Rochester, Lockport & Buffalo R.R.	.....	.....	1.40	....
Schenectady Ry.	.....	.....	0.85	....
Southern New York Power & Ry. Corp.	.....	.....	0.11	....
Syracuse & Suburban R.R.	0.14	.....	0.65	....
Third Avenue Ry.	0.07	.....	16.50	....
United Traction Co.	.....	.....	1.95	....
Wallkill Transit Co.	.....	.....	0.25	....
Waverly, Sayre & Athens Trac. Co.	.....	.....	0.50	....
Western New York & Penna. Trac. Co.	.....	.....	2.00	12.00
Ohio				
Cincinnati & Dayton Traction Co.	.....	.....	1.00	3.00
Cincinnati Traction Co.	2.15	.....	9.32	....
City Railway	2.00	.....	.....	....
Columbus Railway, Power & Lt. Co.	0.16	.....	4.07	3.59
Community Traction Co.	.....	.....	1.72	....

(Continued on Page 44)

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Ohio (Continued from Page 43)

	Extensions, Miles City	Extensions, Miles Interurban	Rebuilt, Miles City	Rebuilt, Miles Interurban
Cleveland & Eastern Traction Co.	.....	.....	.....	1.50
The Cleveland Railway	1.50	.....	26.81	....
Dayton & Western Traction Co.	.....	0.38	.....	....
Lancaster Traction & Pwr. Co.	.....	.....	0.32	....
Northern Ohio Traction & Lt. Co.	2.38	.....	1.23	....
Ohio River Electric Ry. & Power Co.	.....	.....	.....	0.25
Pennsylvania & Ohio Traction Co.	.....	.....	0.42	....
Pennsylvania-Ohio Electric Co.	.....	.....	0.61	0.40
Richland Public Service Co.	.....	.....	0.72	....
Toledo, Fostoria & Findlay Ry.	.....	.....	1.00	6.00
Youngstown Municipal Ry.	.....	.....	5.28	....
Pennsylvania				
Allegheny Valley St. Ry.	.....	.....	0.74	....
Altoona & Logan Valley Elec. Ry.	1.00	.....	0.50	....
Beaver Valley Traction Co.	.....	.....	0.22	....
Buffalo & Lake Erie Traction Co.	1.29	.....	2.20	3.46
Center & Clearfield Ry.	.....	.....	.....	0.50
Citizens Traction Co.	.....	.....	0.61	....
Conestoga Traction Co.	.....	.....	0.93	0.03
Danville & Sunbury Transit Co.	.....	0.19	.....	....
Eastern Pennsylvania Rwys.	0.20	.....	1.50	1.00
Frankford, Tacony & Holmesburg St. Ry.	.....	.....	2.50	....
Harrisburg Railways	.....	.....	0.50	....
Johnstown & Somerset Ry.	.....	5.00	.....	....
Johnstown Traction Co.	.....	.....	1.25	....
Northampton, Easton & Washington Tract. Co.	.....	.....	.....	1.00
North Branch Transit Co.	.....	.....	0.85	....
Northeastern Pennsylvania Ry.	.....	.....	0.33	....
Philadelphia Rapid Transit Co.	0.68	.....	10.26	....
Pittsburg Railways	.....	.....	15.00	....
Reading Transit & Lt. Co.	0.41	.....	2.80	12.50
Schuylkill Railway Co.	.....	.....	1.50	3.00
Scranton Ry. Co.	.....	.....	1.46	....
Susquehanna Traction Co.	.....	.....	0.50	....
Valley Rwys.	.....	.....	.....	0.50
West Chester St. Ry.	.....	.....	1.00	....
West Penn Rys.	.....	.....	5.34	....
Total	65.15	6.22	230.31	65.18

South of the Ohio and East of the Mississippi River

Alabama				
Alabama Power Co.	.....	.....	2.00	....
Mobile Light & R.R. Co.	.....	.....	0.30	....
Montgomery Light & Traction	2.00	.....	.....	....
Florida				
Jacksonville Traction Co.	0.09	.....	0.29	....
Key West Electric Co.	.....	.....	0.31	....
Miami Traction Co.	.....	.....	5.00	....
Tampa Electric Co.	0.18	.....	2.50	....
Georgia				
Athens Ry. & Elec. Co.	.....	.....	0.87	....
Columbus R.R.	.....	.....	1.48	....
Georgia Ry. & Pwr. Co.	0.53	.....	3.56	....
Rome Ry. & Lt. Co.	.....	.....	0.50	....
Savannah Electric Co.	1.93	.....	.....	....
Valdosta St. Ry.	.....	.....	1.00	....
Kentucky				
Kentucky Traction & Terminal Co.	.....	.....	0.74	....
South Covington & Cincinnati St. Ry.	1.11	.....	0.15	....
Louisiana				
New Orleans Railway & Lt. Co.	0.45	.....	8.00	....
Orleans-Kenner Traction Co.	.....	11.37	.....	....
Mississippi				
Laurel Lt. & Ry. Co.	.....	.....	2.00	7.00
Vicksburg Lt. & Traction Co.	.....	.....	4.00	....
North Carolina				
Durham Public Service Co.	0.18	.....	1.10	....
Tidewater Power Co.	.....	.....	1.00	1.00
Southern Public Utilities Co.	.....	.....	0.75	....
Tennessee				
Citizens Ry.	.....	.....	1.65	....
Knoxville Railway & Lt. Co.	.....	.....	0.76	....
Memphis Street Ry.	0.15	.....	6.15	....
Virginia				
Danville Trac. & Pwr. Co.	.....	.....	2.00	....
Newport News & Hampton Ry., Gas & Elec. Co.	.....	.....	0.25	....
Richmond & Fairfield El. Ry.	.....	0.50	.....	....
Virginia Ry. & Pwr.	1.11	.....	4.91	....
West Virginia				
Charleston-Dunbar Traction Co.	0.20	.....	0.75	....
Charleston Interurban R.R.	0.25	1.00	2.00	....
Monongahela Power & Rwy. Co.	.....	0.20	1.10	....
Princeton Power Co.	1.25	.....	.....	....
Total	9.43	13.07	55.12	8.00

West of the Mississippi River

Arkansas				
Fort Smith Lt. & Traction Co.	.....	.....	1.50	....
Southwestern Gas & Electric Co.	.....	.....	1.00	....
California				
Los Angeles Ry. Corp.	.....	.....	16.30	....
Pacific Electric Ry.	.....	.....	7.22	5.83
Pacific Gas & Electric Co.	0.08	.....	1.00	....
Peninsular Ry.	0.05	0.01	.....	2.50
Petaluma & Santa Rosa R.R.	.....	0.48	.....	....
San Diego Elec. Ry.	.....	.....	1.00	....
San Francisco, Napa & Calistoga Ry.	.....	.....	0.36	1.18
San Francisco-Oakland Terminal Rys.	1.32	0.04	2.70	....
Visalia Electric R.R.	.....	0.24	.....	1.50
Colorado				
The Denver Tramway	.....	.15	13.50	....
The Western Lt. & Pwr. Co.	.....	.....	1.00	....
Iowa				
Iowa Railway & Lt. Co.	.....	.....	0.21	....
Keokuk Electric Co.	.....	.....	0.10	....
Mason City & Clear Lake R.R.	.....	.....	0.72	....
Ottumwa Ry. & Lt. Co.	.....	.....	0.50	....
Tama & Toledo R.R.	.....	.....	0.19	....
Minnesota				
Duluth Street Ry.	1.24	.....	.....	....
Mesaba Ry.	.....	.....	.....	8.60
Twin City Rapid Transit Co.	4.61	0.15	6.16	....
Missouri				
Cape Girardeau-Jackson Interurban Ry.	.....	.....	4.50	....
City Light & Traction Co.	1.88	.....	.....	....
Kansas City, Lawrence & Topeka Elec. R.R.	.....	.....	.....	1.50
Kansas City Rwys.	.....	0.40	.....	....
Missouri Electric R.R.	.....	0.01	.....	5.27
St. Joseph Ry., Light, Heat & Pwr. Co.	.....	.....	0.51	....
United Rwys. Co. of St. Louis	0.05	0.05	26.41	1.45
Nebraska				
Lincoln Traction Co.	0.33	.....	0.33	....
Omaha, Lincoln & Beatrice Ry.	.....	0.50	.....	....
Omaha & Council Bluffs St. Ry.	.....	.....	6.00	....
North Dakota				
Grand Forks Street Ry.	.....	.....	0.61	....
Oklahoma				
Northeast Oklahoma R. R.	.....	5.00	.....	....
Oklahoma Ry.	3.00	.....	3.00	....
Pittsburgh County Ry.	.....	.....	.....	1.00
Tulsa Street Ry.	.....	.....	1.86	....
Oregon				
Pacific Power & Lt. Co.	.....	.....	0.38	....
Portland Ry., Lt. & Pwr. Co.	0.03	2.39	3.88	....
Texas				
Dallas Ry.	1.90	.....	.....	....
El Paso Elec. Ry.	0.87	.....	.....	....
Galveston Elect. Co.	.....	.....	1.00	....
Northern Texas Tract. Co.	2.32	0.92	.....	....
San Antonio Public Service Co.	.....	.....	1.91	....
Wichita Falls Traction Co.	1.50	.....	.....	....
Utah				
Bamberger Electric R.R.	.....	3.30	.....	....
Washington				
Seattle Municipal Ry.	3.97	.....	.....	....
Seattle & Rainier Valley Ry.	.....	.....	3.00	....
Washington Water Pwr. Co.	.....	.....	0.87	....
Yakima Valley Transportation Co.	0.04	0.11	.....	....
Wisconsin				
Milwaukee Electric Ry. & Lt. Co.	2.43	0.43	8.10	1.20
Total	25.62	14.18	115.82	30.03

Outside the United States

Canada				
Brantford Municipal Ry.	2.31	.....	1.02	....
British Columbia Elec. Ry.	0.55	0.07	0.76	....
Cornwall St. Ry. Lt. & Pr. Co.	.....	.....	0.33	....
Hull Electric Co.	.....	.....	1.00	....
Lethbridge Municipal Ry.	.....	.....	3.00	....
Montreal Tramways	2.62	.....	13.48	....
Niagara, St. Catharines & Toronto Ry.	.....	0.40	3.70	1.20
Quebec Ry. Light, Heat & Pwr. Co.	0.10	.....	.....	....
Saskatoon Municipal Ry.	0.49	.....	.....	....
Winnipeg Electric Ry.	0.33	.....	1.00	....
Total	6.40	0.47	24.29	1.20

The fact that electrified steam lines have added very little new mileage during the past two years makes a comparison with totals for previous years seem very low.

While track extensions have not been made, track forces have not been idle, as is indicated by the large amount of reconstruction carried out. The number of railways reporting reconstruction of their tracks the past year is 184 and they report a total of 615.21 miles as reconstructed. This is greater than any year since we began compiling this information, the largest amount previously reported being for the year 1919, when 390.64 miles was reconstructed.

An accompanying chart and table give a comparison

SUMMARY OF TRACK CONSTRUCTION—1921

	New England District	North of the Ohio and East of the Mississippi	South of the Ohio and East of the Mississippi	West of the Mississippi	Total United States	Canada	Total
TRACK EXTENSION							
Number of companies	4	26	16	25	71	7	78
Miles of track:							
Urban	1.55	65.15	9.43	25.62	101.75	6.40	108.15
Interurban	5.01	6.22	13.07	14.18	38.48	0.47	38.95
Total track extended	6.56	71.37	22.50	39.80	140.23	6.87	147.10
TRACK RECONSTRUCTION							
Number of companies	20	91	28	37	176	8	184
Miles of track:							
Urban	63.42	230.31	55.12	115.82	464.67	24.29	488.96
Interurban	21.84	65.18	8.00	30.03	125.05	1.20	126.25
Total track rebuilt	85.26	295.49	63.12	145.85	589.72	25.49	615.21

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COMPARISON OF TRACK CONSTRUCTION

Year	No. of Companies	Extensions: Urban Track	Extensions: Interurban Track	Extensions: Electrified Steam Lines	Total	Track Rebuilt
1907	(a)	(a)	(a)	.....	1,880.00	(a)
1908	157	1,174.5		84.00	1,258.50	(a)
1909	160	774.7		112.40	887.16	(a)
1910	217	1,204.8		192.40	1,397.20	(a)
1911	223	1,105.0		86.50	1,191.50	(a)
1912	171	869.4		80.80	950.20	(a)
1913	181	974.9		119.00	1,093.90	(a)
1914	163	716.5		229.00	946.40	(a)
1915	136	596.0		448.20	1,044.20	(a)
1916	104	115.40	240.90	388.00	744.30	(a)
1917	121	251.10	125.60	66.00	442.70	375.40
1918	80	216.41	97.41	275.70	589.53	155.43
1919	73	110.90	29.67	287.60	428.17	390.64
1920	87	145.69	30.87	8.92	185.48	361.77
1921	78	108.15	38.95	8.08	155.18	615.21

(a) Not available.

of new track extensions by years since 1907. The shaded area in the chart represents the amount of electrified steam line extensions, which has dropped to almost nothing during the last two years but which gives every indication of becoming greater than ever in the next few years. In the table the mileage for track extensions has been separated between urban and interurban service since 1916. Previous to that date information for such a segregation was not available.

The single track mileage for extensions and reconstruction is given by individual companies in the large table. Following our usual practice the various railways are alphabetically grouped by states and the states into five geographical districts to correspond with other similar tables in this issue. The group north of the Ohio and east of the Mississippi river has built more extensions and rebuilt more track than any of the other groups. This is quite logical as this district includes the greatest amount of electric railway mileage. The information for this table was prepared from replies to a questionnaire sent to all railways in the United States and Canada. Approximately 750 companies replied.

ELECTRIFIED STEAM LINES

	Extensions, Miles
New York, New Haven & Hartford R.R.	0.19
New York, Westchester & Boston	3.56
Northeast Oklahoma R.R.	4.00
The Oshawa Railway (Canada)	0.31
Niagara Junction Railway	0.02
Total	8.08

No reconstruction of track reported.

New York State has the largest mileage for track rebuilt, with nineteen companies reporting a total of 62.28 miles reconstructed. Eight companies from Canada report 25.49 miles of track reconstructed.

Proper Illumination Attracts Passengers*

A Light Interior Finish, Correctly Designed Reflectors and Proper Outlet Spacing Produce in Combination an Attractively Lighted Car

By J. A. SUMMERS
Assistant Illuminating Engineer, General Electric Company, Harrison, N. J.

BUSINESS men have found that light draws trade. This has been so definitely proved that few would attempt to contradict it. We see the results on every side; the crowd gathers where the bright lights are; they stop and examine the brightly lighted show windows; they drift unconsciously to the brightly lighted theater entrance or restaurant. If street cars are made bright and attractive it is perfectly logical to assume that human nature will react in the same manner with regard to them as it does to brilliant illumination in other places.

That the public does react in this manner was definitely shown recently in the subway in New York. On some of the local trains alternate cars had about 25 per cent more light than the others and it was observed that the brighter cars were occupied before the others. Experiences of this kind indicate that it is entirely logical to apply merchandising methods to attract passengers.

I have heard some say that it is not necessary to attract passengers. This may be true in some cases, but in the large majority of cases the electric railways are exerting every effort to attract the public to their cars. The profits of a company depend largely on the number of people who can be induced to ride who are not forced to ride. Brightly lighted cars are without question a powerful aid in attracting these casual riders, and hence the proper illumination of cars should receive very serious consideration.

There are a great many variables to be considered in planning the lighting of a car. The interior finish of the car, the voltage regulation, arrangements of the seats and the standard of lighting in the community have a very decided bearing on the selection of the proper lighting equipment. The interior finish makes a great difference in the resulting illumination. This is true regardless of the reflector equipment. A car with a dark finish is likely to appear dark even though the photometer shows that the illumination is adequate. The psychological effect of such a car is depressing and the passengers feel that there is insufficient illumination, hence the unjust criticism. A gloomy car also suggests uncleanliness and frequent resentment is expressed by passengers because of being compelled to ride on "dirty, gloomy cars." This feeling does considerable harm to the railways not only by causing the antagonism of the public but by repelling the short-haul passenger.

A flat white ceiling with light color woodwork is of course most desirable from an illumination standpoint, but a light tinted ceiling, which many companies prefer, is quite satisfactory. Such a finish will add 20 to 40 per cent to the illumination secured with the dark green ceiling so often seen, and naturally the car will appear much brighter and more cheerful. If a gray tint is used, the paint should be mixed with vermillion and emerald green and reduced with white until the proper tint is secured. A gray that is mixed with lamp black has a much higher absorption than a warm gray mixed as above.

The shape of the ceiling also has a decided bearing on the illumination. The arch roof is a much better arrangement from a lighting standpoint because the light is not bottled up in the clearstory. This arrangement also provides better light on the advertising cards.

The amount of light necessary and the arrangement of the outlets are matters that have received considerable attention and aroused a great deal of discussion. It is a relatively simple matter to state the minimum requirements for safety and for reading without eye strain, but this does not really satisfy the conditions from an economic standpoint. The standard of lighting in offices, stores and industrial plants has increased materially in the last few years and this naturally influences the public's demand for higher intensities in street cars.

An average of 3.5 to 4.0 foot-candles in a car was considered very good lighting several years ago, while now there is a strong tendency to go to at least 10 foot-candles and even higher so as to conform to the new industrial standards. This is not an unreasonable intensity, and can easily be secured with proper reflectors with an expenditure of power of about 2 watts per square foot of floor area.

One must not forget the fact that the 10 foot-candles measured in an empty car at rest and with lamps operating at normal voltage will be reduced to not over 6.0 foot-candles when the car is crowded and the voltage lowered as much as it is on the majority of electric lines. The cross reflection which adds up in the empty car is also entirely absorbed in a crowded car, and due allowance should be made for this fact when estimating the desired intensity.

A much higher intensity is necessary to read comfortably in a railway car than in a home or office, because the vibration and jolts of a rapidly moving car cause a rapid movement of the reading matter which is hard to follow without great eyestrain under low intensities. Many tests on the speed of vision have shown that an intensity of 10-foot candles is necessary to read rapidly changing print.

One row of lamps on the center line of the car is the most economical way of placing the units, and an illumination test in an empty car would show a satisfactory distribution of light. The results are also fairly satisfactory to the passengers if the seats are arranged across the car. In this case

*Abstract of a paper presented before the New York section of the Illuminating Engineering Society.

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the standing passengers do not cast objectionable shadows on the seated passengers. However, if the seats are arranged longitudinally the results are often unsatisfactory whenever there are standing passengers. The arms and hands holding on to the overhead straps effectually prevent the light from reaching the seated passengers. In the latter case, therefore, use should be made of two lines of units, placed just inside the edge of the seats. In all cases medium density opal reflectors should be used and in no case should they be spaced more than 5 ft. apart. If the units are placed under the clear-story it is of prime importance to use reflectors as a standing passenger is so close to the lamps that to him an unshaded lamp is exceedingly annoying. Exposed lamps in this position also detract from the advertising value of the cards under the half-deck because of the glare.

Many accidents have occurred to passengers alighting from cars because of inadequate light at the steps. Persons are temporarily blinded when going from a brightly lighted platform to the dark steps and many serious falls have resulted. Several methods have been satisfactorily tried to solve this problem. One is to utilize one circuit just inside the door to operate when the door opens. Another method is to set a lamp in a recess at each end of the step, each lamp operating in series with the circuits inside the car. The latter method is the better one when the construction of the car permits its use.

The principal points to consider in designing the illumination of a car, either new or when remodeling, is the value of a light finish on the ceiling, the use of a proper reflector, spacing of the lamps not to exceed 5 ft., and an intensity high enough not only to make comfortable reading but to attract passengers to a well-lighted car.

Mid-Winter Meeting of New York Electric Railway Association

THE program for the technical sessions of the mid-winter meeting of the New York Electric Railway Association has now been completed by the committee of subjects, of which B. E. Tilton, vice-president New York State Railways, Syracuse Lines, is chairman. The meeting will be held at the Astor Hotel on Jan. 24 and will include a morning and an afternoon session with a banquet in the evening.

At the technical sessions three papers will be presented as follows:

1. "One-Man Car Operation with Double-Truck Cars," by H. S. Sweet, master mechanic New York State Railways.

2. "Workman Compensation Plan as a Continuing and Increasing Liability to Electric Railway Companies," by Martin E. Burke, assistant general attorney Interborough Rapid Transit Company, New York.

3. "One Year's Experience with the Service-at-Cost Plan in the City of Rochester," by Charles R. Barnes, street railway commissioner of the city of Rochester.

It is expected that a great deal of interesting and valuable information will be brought out in these papers. Each speaker is an authority on the subject to be treated by him. Mr. Sweet has recently designed for the company with which he is connected a car of the type he will undoubtedly describe in his paper, and it is said to be giving very good satisfaction. Mr. Burke has entire charge on the system with which he is connected of the legal side of the application of workmen's compensation. The paper and resulting discussions will undoubtedly bring out the increasing value of safety campaigns and proper instruction of employees. Mr. Barnes was for many years electrical expert for the New York State Public Service Commission, Second District, but became street railway commissioner of the city of Rochester when the service-at-cost franchise was put in force there a little more than a year ago.

There will be the usual dinner in the evening. It will also be held at the Astor, and among the speakers will be Hon. Fred S. Purnell, member of Congress from Indiana. His topic will be: "The Turn of the Tide in American Problems of Today." The banquet committee has also secured the presence and services at the banquet of the male quartet whose songs proved most popular at the Lake George meeting.

Congress Wants to Know

THE joint Congressional committee which is conducting a very comprehensive investigation of the economic situation surrounding agriculture recently called upon the American Electric Railway Association for detailed information with regard to electric railway rates and a long list of other questions which would have involved the sending of a questionnaire to every company in the country. Since the electric railways transport an insignificant proportion of farm products, Chairman C. L. Henry of the national relations committee, and James W. Welsh, executive secretary of the association, went to Washington to inquire of the committee if it would be benefited particularly by the information in the form requested. After listening to Messrs. Henry and Welsh, the committee modified its request and will ask only for a general statement by Mr. Henry on the relationship between electric railway operation and the agricultural industry.

American Association News

Executive Committee Meeting

THE executive committee of the American Electric Railway Association met at the headquarters office in New York on Friday, Dec. 30.

There were the usual routine reports of the executive secretary and of some of the committees by means of which the executive committee is kept in touch with the active management of the association.

The subjects and meetings committee, C. D. Emmons, chairman, reported the program for the mid-year conference at Indianapolis as given in last week's issue of the ELECTRIC RAILWAY JOURNAL. In addition to the program it announced, Mr. Emmons reported that there would be an attempt made to have an address on "A Woman's Viewpoint on Electric Railways and Electric Railway Service" by some woman the committee would invite for the purpose.

The committee on publications, L. S. Storrs, chairman, reported progress. It announced the resignation of Henry Surguy as editor of *Aera*, stating that the position had not yet been filled. Mr. Storrs also stated that the committee was also working on a definite announcement to the association as to how *Aera* as an association publication could be made more useful.

The committee on company membership reported the following new associate members: Ford, Bacon & Davis, United Gas Improvement Company, American Light & Traction Company and A. S. Richey, consulting engineer; and the following operating company: Montgomery (Ala.) Light & Traction Company.

The president was authorized to appoint the usual committee on the location of the 1922 convention. This committee was asked to make recommendations in regard to having exhibits.

The question of a vote for or against the American valuation policy in the tariff as contained in the National Chamber of Commerce referendum was presented by Mr. Storrs, the association's counsellor. The executive committee authorized a vote for the American valuation plan.

The question of the association taking some action to evolve a standard method of classification of employees in order to make easier the comparisons of the wages and other statistics between the different companies was brought up. The executive committee referred the question to the executive committees of the Engineering and Transportation & Traffic Associations, with a recommendation that a joint committee on this question be appointed. The question of expenses of committee members of all the associations was brought up and referred to the finance committee, with a request for a report and recommendation at the January meeting.

On account of the fact that the fourth Friday of January conflicted with the annual meeting of the Central Electric Railway Association, it was decided to hold the January meeting of the executive committee on Jan. 20, in New York.

Those present at the meeting on Dec. 30 were President R. I. Todd, Vice-President C. D. Emmons and J. N. Shannahan, Past-Presidents L. S. Storrs, John Stanley and C. L. Henry; L. H. Palmer, president affiliated association; R. P. Stevens, W. H. Sawyer and P. S. Arkwright, operator members-at-large; C. R. Ellicott, L. E. Gould, S. M. Curwen, manufacturer members; Treasurer B. G. Collier, and Executive Secretary J. W. Welsh.

Education Committee Busy

AN AMBITIOUS program was blocked out by the committee on education at its meeting held in New York City on Jan. 3. Some details of this will be given in a later issue. The co-operation of the industry will be asked in order that the most effective possible use of the committee's efforts may be made.

The committee on education members and visitors present included Edward Dana, chairman; M. B. Lambert, E. A. West, F. R. Phillips, William Von Phul, E. J. Blair, A. E. Potter, C. S. Coler and W. H. Timbie.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

12 per Cent Wage Cut

Employees at St. Paul and Minneapolis Reduced Following Restraining Order on Higher Fare

Employees of the electric railways in St. Paul and Minneapolis, Minn., experienced a 12 per cent cut in wages beginning Jan. 1, 1922. This was announced by the companies immediately following the permanent injunction restraining the St. Paul City Railway from putting into effect the 7-cent fare ordered by the State Railroad & Warehouse Commission. The decision was made on Dec. 28 by Judge F. M. Catlin in the Ramsey District Court. The cut affected 4,200 men, of which number 2,300 are trainmen. This cut practically returns the men to the status before the advance of July, 1920.

A conference of trainmen was called immediately following the decision, or six committees from six stations. The chairmen issued statements of confidence that the men would accept the cut. President Horace Lowry explained the cut was a direct result of the failure of the St. Paul company to obtain relief in the district court through an increase in fare of 1 cent.

Wages of trainmen will be as follows: First year of service, 40 cents an hour; second year, 51 cents; third year and after, 53 cents. Vacations will be unchanged. Overtime is at the rate of 10 cents an hour extra over nine hours. Wages were 55, 58 and 60 cents.

Frank Wagner for the men said:

The men realize the situation of the company. They are prepared to accept the 12 per cent cut without controversy. Conditions are satisfactory to them and they are willing to make necessary sacrifices to keep the lines operating.

President Lowry said in part:

During July, 1920, the wages of employees of this company were increased 20 per cent and the company was authorized to collect a 6-cent fare, but because of the increased expenses due to the increased payroll and increased service, the net earnings of the company have constantly decreased so that the margin of safety is now wiped out and the owners of the property are not receiving a fair return on the money invested in the property.

When the increase in fare and wages was made, your management knew the company would lose money by the process, but felt that in time the company would receive higher fares or that operating expenses would fall, and it now believes living costs have so declined that it is justified in lowering wages in order to reduce operating costs.

The company has many obligations imposed upon it as a public service corporation, among which the following should receive first consideration:

To render a good public service.

To pay a fair wage to its employees.

To pay to its stockholders a reasonable return on the fair value of their property.

The company has made every reasonable and possible effort to obtain relief through an increase in fares, but has met with constant delays through governmental proceedings and legal attacks, and there is no prospect of immediate relief for the company.

Even though the company secured the ½-cent increase in fare, it would not be sufficient to meet its actual needs although it is all the company asked for in its application to the railroad commission for a temporary fare of 7 cents cash, four tokens to be sold for 25 cents. The company hoped that the granting of this temporary fare would prevent a receivership for part of its property pending the final valuation of the property by the commission and the establishment of a rate based thereon.

In most of the cities above named where wages have been reduced a higher rate of fare is being collected on the street cars than in either Minneapolis or St Paul.

The management of this company believes the public generally is willing to pay a reasonable fare for street railway transportation when it believes that the property is operated under an efficient management, but that it has a right to expect the company to keep its payroll in line with prevailing wages.

In view of the above facts and considering the financial condition of the company, the management finds it necessary to make a reduction in wages of approximately 12 per cent.

Seattle Reply Brief

In its suit against the city of Seattle, called "specific performance suit," the Puget Sound Power & Light Company has filed its reply brief. The case has already been heard before Federal Judge E. E. Cushman, but the points and authorities of the litigants are still being filed with the court.

If the suit is decided in the manner desired by the Stone & Webster interests, it is pointed out, the city will thereafter be obliged to pay interest and principal on the $15,000,000 bonds out of gross revenues first, and to pay the cost of operation and maintenance of the railway system out of the general tax fund, if the revenues were not sufficient to pay both.

In this case, the Stone & Webster interests are seeking to have the Federal Court take jurisdiction over the traction system, and also to make the charges of interest and principal on the $15,000,000 bonds superior to the charges of operation and maintenance.

The city contends that there is no controversy existing between the parties to the suit, and asks that the action be dismissed without prejudice.

In their reply, Stone & Webster submit the following:

1. That the city is bound to pay the cost of operation and maintenance out of its general fund in case the gross revenues are insufficient to pay the bonds with interest, and also the cost of operation and maintenance.
2. That the city is bound to operate the railway until the bonds with interest shall be paid even if the cost of operation and maintenance must be paid out of the general fund.
3. That the plaintiff is entitled to a decree so adjudging.

In another part of this brief, it is stated, that "the plaintiff seeks to have its rights under the bonds and ordinances and the obligation of the city with respect thereto determined is only natural."

Date for hearing of the suit of the fourteen taxpayers to prevent the city from delving into the general fund for the support of the municipal street railway has been set on the calendar of the Superior Court for January 10. In this case the point will be decided whether the entire gross revenues of the railway are pledged to payment of interest and principal of the $15,000,000 indebtedness to Stone & Webster or whether the bondholders are entitled only to what is left after the cost of operation and maintenance has been paid.

Elevated Proposal Rejected

Mono-Rail Project Turned Down by Council of Detroit—City Opposed to Elevated Construction

The matter of a proposed elevated line which the Michigan Elevated Railway sought permission to build in Detroit has been disposed by the City Council after about a year of delay. The petition has been denied by the Council. The engineers for the L-line appeared before the Council ready to go into details regarding the proposed line, which was to be a demonstration line, but were not permitted to explain their proposition in all of its various details.

Mayor Opposed to Experiment

Mayor Couzens had stated that he would abide by the decision of the Council and the Council had previously referred the matter to the Street Railway Commission. The Mayor later expressed his disapproval of any experimental lines and the Council was unanimous in its decision against the construction of a transportation system that is new in the country. The Michigan Elevated Railway proposed to install a transportation system utilizing mono-rail cars.

The company had asked permission to build on a day-to-day agreement with the provision that if the city decided it desired to proceed with that type of transportation after the experimental line had been completed, the company would allow the city to take over the line. Members of the Council were of the opinion that Detroit was not in need of an elevated railway and probably never would need it.

The State Supreme Court on Dec. 22 affirmed the right of the city of Detroit to build a double-track railway on Eliot Street, one of the streets traversed by the municipal crosstown line. The construction of the track was opposed and the legality of the street railway bonds questioned by residents of Eliot Street. The case was decided in favor of the city in the lower court. This decision was upheld by the State Supreme Court.

City Now in Possession of Day-to-Day Lines

Formal possession of the 29 miles of day-to-day lines was taken by the city upon payment of the arbitrated price of approximately $2,300,000 decided upon by the board of arbitrators. With the lines the city acquired 128 cars similar to those in use on Woodward Avenue. The Detroit United Railway will continue to operate over the day-to-day lines and will pay the city 20 cents per car mile, the same amount the city pays the company for operating over its tracks on the Trumbull line. The current for operating the cars on the day-to-day lines now runs through the city's meters and no interruption of service will result while further plans are being made.

Ross Schram has been named as assistant general manager of the municipal railway.

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Richmond Wages Cut

Pay for New Men Is Fixed Under the Readjusted Scale at Thirty Cents an Hour

Drastic cuts have been announced in the wages of all employees of the Virginia Railway & Power Company. The notice of the changes was posted on Dec. 31 at all carhouses in Richmond, Norfolk, Petersburg and Portsmouth. It is addressed to all employees of the several divisions of the railways of the company, including employees belonging to the several locals of the Amalgamated Association. The statement follows:

Since the earnings of all our street railways have been steadily, and of late very rapidly, falling off because of unregulated jitney competition on routes served by street cars, the growing popularity of private automobile travel, and the general decline in industrial activity, while the operating expenses have remained practically stationary, it has become necessary to make a substantial readjustment of wages of all street railway employees.

For the year ended July 1, 1921, the entire street railway system failed to earn operating expenses and fixed charges (interest on bonds, etc.) by $553,887, and since that time up to now the decline in travel has grown rapidly worse. This deficit in bond interest to July 1 last was made good by the company from other sources, not now available for this purpose.

It is, therefore, necessary to cut down operating expenses to a point where the street railway system will at least earn the taxes and bond interest, hence it is proposed to put into effect the following wage scale for all motormen and conductors, effective Jan. 16:

First year	Second year	Thereafter
30c per hour	35c per hour	40c per hour

Five cents per hour will be added to the above scale for one-man operation and for motormen and conductors employed on the Richmond-Petersburg interurban trains.

The per hour rate of wages for all classified railway employees in shop and carhouse departments will be reduced 10 per cent from the present rates on Jan. 16, 1922.

It is hoped that prompt relief, through jitney regulation, prohibiting such operation along the routes served by street cars, and more liberal franchises, relieving the street car rider from burdens now imposed, may so reduce operating expenses as to make unnecessary further reductions in wages.

Full information is always available to all employees in order that they may fully understand the necessities of the case, and further information as to the present situation of the street railway finances will be gladly made available.

The present rate in Richmond, entered into a year ago last September, and continued after the expiration of the year without further definite agreement, provides for platform men, for the first three months in service, 43 cents an hour; for the next nine months 45 cents an hour and thereafter 47½ cents an hour. The cut therefore falls heaviest on short-term men.

There were no new developments at the offices of the company. General Manager Harvell said he knew only what he had read in the papers as to projected meetings of the employees and of committees to consider the new wage scale. He had not been asked, he said, for any conference, but would meet the men if they desired.

Approximately 700 men are affected by the wage cut in four cities—one-half of the entire number in Richmond.

Mr. Harvell said the company had not had occasion to employ many men since September, as there have been few vacancies, but has had many applications for appointments as motormen and conductors, and he was quite certain that any vacancies could be readily filled from a list of applications on file.

George L. Wilcox, executive secretary of the Central Trades and Labor Council, stated that the employees realize that the railway is not making money, but at the same time, he said, the men cannot live on much less than they are now receiving.

Twenty Hurt in New York Elevated Crash

One person was killed and twenty persons were injured in New York city on Dec. 30, when a four-car southbound elevated train crashed into a stalled four-car train on the Ninth Avenue line just south of the Forty-second Street station. The Interborough Rapid Transit Company is now conducting an examination of the causes of the accident. The following statement has been made by the company:

The 6:34 p.m. Ninth Avenue train from 157th Street south bound in charge of Motorman Gallagher and Conductor J. Moran developed some electrical operating difficulties and stopped with the tail end of Gallagher's train at about Fortieth Street.

A following Ninth Avenue train in charge of Motorman Aberaitis and Conductor Carrigan proceeded south from 157th Street and made all the station stops, including the station at Forty-second Street. Motorman Aberaitis started the train out of Forty-second Street and collided with rear end of Gallagher's train at about Fortieth Street, the accident happening about 7:05 p.m. A complete investigation is now being conducted.

"Warrant Basis" in Seattle

All warrants issued in payment of bill of the Municipal Street Railway, Seattle, Wash., with the exception of those given to trainmen and other employees, have been stamped "Not paid for want of funds until called." The street railway has been thus partly placed on a "warrant basis," so City Treasurer Ed. L. Terry may begin to accumulate sufficient funds to pay $833,000 of principal and $375,000 of interest due March 1 to the Stone & Webster bondholders of the $15,000,000 indebtedness. Officials estimate the sum should be on hand not later than Jan. 27.

A 1922 Resolution in Winnipeg

Winnipeg, Canada, believes in the good old resolution practice for the New Year. Ever mindful of giving better service to its patrons the Winnipeg Electric Railway has made an appeal to the public to co-operate in every way possible with the railway in 1922. The *Public Service News* has outlined ten resolutions which it suggests electric railway travelers should make. They are as follows:

1. That I will always have exact fare ready.
2. That I will ask for my transfer when I pay my fare.
3. That I will always move to the front end of the car.
4. That I will be near the exit door when my car reaches the point where I wish to alight.
5. That I will use the front exit when travelling on "front-exit" cars.
6. That I will not board the first car that comes along if it is well filled.
7. That I will give the street railway my full support and co-operation to the end that it may be able to serve me better.
8. That I will be on the look-out to suggest to the company where improvements for the common good might be made.
9. That I will always remember that delays in service are not of the company's seeking and that in most cases some "foreign" cause is responsible.
10. That I will join hands with the company in the endeavor to make the year 1922 a record one in point of service to the car riders.

Financing Being Probed

State Department Concerned Over Order Requiring Extension to Be Built at Tacoma

The attitude of the City Commissioners of Tacoma, Wash., toward a possible order of the State Department of Public Works requiring the Tacoma Railway & Power Company to construct an extension of the Sixth Avenue line into the College of Puget Sound and North Stevens Street district, with an attached condition that the city of Tacoma relieve the railway of some of its franchise requirements so that it can finance the extension, was probed at a recent hearing by the state department.

Commissioners Bound By Charter Provision

The reply of the City Commissioners was that they feel themselves morally bound by the charter provision that they cannot amend franchise conditions without authorization by vote of the people, even if the State law nullifies the charter in this particular, and gives them power to act on their own responsibility. The opinion of the Attorney General that the commissioners have the power to alter the franchise if they see fit to do so was read by the state officers without effect.

Evidence submitted by the department's own engineers and by the Tacoma Railway & Power Company's engineers showed that the proposed extension will probably not be able to pay its way for years, and that the company is unable at present to borrow funds or otherwise finance an extension of its lines although willing to do so.

Herbert J. Flagg, chief engineer of the State Department of Public Works, who investigated the proposed extension, stated that it would cost not less than $30,000, and the operating costs would be $14,414 a year, against which the estimated revenues, above what the company now takes in, would be $1,200 a year. Going into the company's finances, he said he found the company has gone $350,000 further in "red" during the past two years. The valuation of the company's properties he gave as $6,475,000, on which basis he said the company earned $0.88 per cent net income for the year ended Oct. 31, 1921, as against $0.41 per cent income for 1921, and deficits of years before the 10-cent fare. The indebtedness of the company he found to be approximately $6,800,000. Car riding had decreased 10 per cent since 1919.

Residents Now Walk

The hearing was adjourned after the Councilmen had been asked to go on record, leaving the inference that the state department may issue such an order as indicated, and allow the Council to put the question up to the people of Tacoma at the May election, whether they want to forego paving between tracks and payment of some of the 2 per cent gross earnings tax, to help the College of Puget Sound and the North Stevens district people get railway service. The College of Puget Sound is held up on the matter of building on its new site until it is known where transportation is to be located. At present the residents of the district, totaling 1,700 persons, have to walk nine and ten blocks to a car line.

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Wage Controversy to Be Arbitrated

Employees of the Springfield (Mass.) Street Railway and the Worcester (Mass.) Consolidated Street Railway voted on Dec. 30 decisively in favor of arbitration to settle their wage difficulties. The wording of the question on which the men voted was as follows:

Would you, in order to avoid arbitration, be in favor of accepting a reduction from your present wage of 8 cents an hour from Jan. 1 to June 30, 1922, and 10 cents an hour from July 1, 1922, to Dec. 31, 1922, provided conditions and hours in old contract remain in force?

The proposition voted upon had not been made by the company. The result means that a board of arbitration will decide the issue. James J. Storrow is the head of the board.

Mayor Charges Pay Scale Discriminatory

Because of objection to the compensation allowed to trainmen of the Seattle (Wash.) Municipal Street Railway, Mayor Hugh M. Caldwell recently vetoed the entire salary schedule for city employees for 1922. It will now be necessary for the Council to pass the bill over the Mayor's veto, or prepare a new schedule.

The Mayor's chief objection to the trainmen's compensation is that the trainmen, now being paid on a daily basis, would receive a reduction of only 8 cents a day, while other day workers in the city's employ would be cut 25 cents a day. The proposed schedule for trainmen was a compromise proposed by the trainmen themselves, placing them on a monthly pay basis, and on the same salary level as policemen and firemen. The Mayor declares that this paves the way for policemen and firemen demanding time and half for overtime, a privilege now enjoyed by trainmen, and for the latter asking for one day off in eight, similar to the privilege granted policemen and firemen.

B. R. T. Plan Starts Second Year

The Employees' Representation Plan of the Brooklyn (N. Y.) Rapid Transit Company entered its second year with the election of representatives on Dec. 9 and 12. Seventy-three representatives were elected by the employees, and of these thirty-seven were office holders the previous year, which shows a practical backing of the work of the representatives. The plan calls for representatives from each group of employees, and where there are two or more for any group, the representatives hold meetings to elect a chairman. The election was closely contested in nearly all of the voting units, election day itself assuming all the marks of a national last-day campaign.

Kentucky Association Will Spread Utility News

The Kentucky Association of Public Utilities, Louisville, Ky., will issue on the first and fifteenth of each month a "New Service Bulletin" containing items of educational interest to public utility companies throughout the State. The aim as expressed in the Bulletin will be "to enlist your friendly interest and co-operation so that a better understanding of our mutual problems may be reached, to the end that the best service possible may be rendered the public."

The first issue, dated Dec. 15, contained among other articles "Service and Its Value," "Servants of the People," and the talk of Martin J. Insull, vice-president of the Middle West Utilties Company, Chicago, Ill., before the annual meeting of the Kentucky Association on Nov. 22 last. In a letter to the newspapers throughout the State the association invites all local utility news for possible publication in the New Service Bulletin.

"Support the Old, Attract the New"—1922 Slogan

A New Year's Greeting with all good wishes was extended in the form of a letter by W. H. Boyce, general manager of the Beaver Valley Traction Company, New Brighton, Pa., to all his employees. In his "Happy New Year" message Mr. Boyce says:

It is essential that you

1. Be polite, and thus avoid many possibilities of trouble with car riders.
2. Be patient with the aged, the infirm, the casual non-understanding rider, and when waiting at transfer points and railway stations; thus gaining the esteem and proper recognition of your ability by patrons and supervisors.
3. Be sincere in conversations concerning the affairs of this company either with patrons, supervisors, or fellow empoyees.
4. Be honest in word and deed with yourselves, the public and your company.
5. Be enthusiastic and earnest in your efforts to give the very best brand of street railway service to be found anywhere.
6. Be confident that the higher officers of this company always want us to have a square deal, and they expect us always to give one.
7. Be loyal to your company, your supervisors, and your fellow workmen. Elbert Hubbard has said, "If you work for a man, in heaven's name work for him." We add to that, "If you are working with men, for heaven's sake work with them."
8. Be harmonious. The utmost harmony among employees of the different departments must prevail at all times, for courteous, respectful treatment of each other will result in better service to the traveling public.
9. Be happy. By radiating and distributing happiness, you so affect all the persons with whom you come in contact that they must reflect your spirit. This will have a tendency to make all of the foregoing easier of accomplishment.

In conclusion the greeting says:

It is with extreme gratification that I realize that this letter is going to be read by employees, all but 2½ per cent (trainmen all) of whom have been in our service over one year, and each of whom I can depend upon for full support in making this year 1922 a happy, prosperous one by furnishing SERVICE—EVERY WAY—ALWAYS.

Interurban Gasoline Rail Line

The proposition of building a railroad between Vallejo and Benicia, Cal., was presented to the Benicia Chamber of Commerce at a meeting on Oct. 27 by Arthur Hargraves, representative of the California Car Company, located at Richmond. The possibilities of a railroad between the two cities had already been presented to local interests, who have approved of the plan.

Mr. Hargraves represents a company which builds a light-weight gas-motor driven car. The car, it is claimed, can be operated at one-fifth the cost of a steam train and at one-third the cost of motor buses. The proposed line would have two of these cars, each with a capacity of forty persons and a maximum speed of thirty-five miles. Track for the cars can be built at a cost much less than that entailed for track for steam and electric trains. The cars themselves would cost approximately $11,000.

Chicago Committee Not Committed to Any Policy

The local transportation committee of the City Council of Chicago, Ill., has made no progress in its attempt to get from Mayor Thompson an expression of views on a new traction settlement. At a meeting held on Dec. 28 the Mayor refused to appear, but sent instead a letter in which he charged Chairman Schwartz with having argued against the Thompson plan for people's ownership and a 5-cent fare. He wanted to know if Alderman Schwartz agreed with him in the principles that:

The streets belong to the people. The people ought to own and operate their means of transportation. The agency to be set up to manage or operate the system of local transportation in behalf of the people should be a board of trustees to be elected by the people.

The fixing of a 5-cent fare to remain at that figure until changed by authority of the people.

It was decided to tell the Mayor that the committee was not committed to any plan and that he would be welcome to submit his proposal.

Several of the Aldermen wanted to take steps to prevent the city administration from diverting the 55 per cent of net receipts to the corporate fund in the event that it is turned over through court proceedings. This is the share of the companies' revenues which the city has refused to accept. It was decided to appoint a sub-committee to look into the matter.

Port Plan Advanced

With the exception of a few minor changes made at the suggestion of New York and New Jersey engineers, the port of New York authority on Dec. 16 adopted unanimously the plan for port development based on the linking of the two states with a system of belt lines which will be submitted to the Governors of the two states. The plan is ready for the Legislatures.

Recommendations that the project be self-supporting, and that no added taxes be levied on the people of the two States for its inception and maintenance were noted by the port commissioners. The changes made in the plan were for the facilitation of transporting foodstuffs for New York by altering some of the belt lines and changing the grade of one of the railroads.

The commissioners have arranged a conference with the presidents of the fourteen railroads contributing to the port development plan.

Equipment Arrives in Miami

Officials of the city of Miami, Fla., which has just taken over the lines of the defunct Miami Traction Company and ordered new equipment to replace that which was burned when the company lost its power plant and car house more than a year ago, have received word that the new cars which were ordered have been shipped. R. L. Ellis, manager of the Miami Beach Electric Company which will operate the Miami electric lines, paying a rental of $6,000 a year on the city's investment of $100,000, states that he expects to be operating by Feb. 1.

Plans for regulating the jitney and bus lines after the trolleys resume are under way, and probably will include elimination of the bus lines along routes traversed by the trolley.

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Way Reopened for Negotiations

Court Holds Nothing So Far Done in New Orleans Negotiations Warrants Judicial Interference

The negotiations between the security holders of the New Orleans Railway & Light Company, New Orleans, La., and the members of the Commission Council which were so abruptly terminated recently by the State Supreme Court, just as the finishing touches were being put to the modified Maloney plan of railway settlement, may now be resumed, if only temporarily, under a decision just rendered by Judge Porter Parker, of the Civil District Court.

It will be recalled that Judge King, of another division of the Civil District Court, on June 30, 1921, issued an order requiring the city of New Orleans, the Commission Council and Mayor McShane, to show cause why they should not be enjoined from entering into an agreement with the company for a rate of fare in excess of 5 cents. This order by the court was made at the instance of the Attorney General.

A suspensive appeal, subsequently sought by the city, was denied by the court, and upheld by the State Supreme Court, to which tribunal the city next appealed for redress, the High Court holding that Judge King was right in refusing to grant the appeal, and that application should be made to the lower court for a dissolution of the injunction which the City sought.

It was at this stage of the long-drawn-out litigation that the negotiations betwen the city and the security holders of the company were broken off and the conferences halted until the opinion of the lower court could be had.

JUDGE PARKER'S RULING

The contention of City Attorney Ivy G. Kittredge, in his petition before Judge Porter Parker, to which court the case was next assigned, was that the Civil District Court was:

1. Without jurisdiction.
2. That the suit was premature since the action was predicated upon what it was thought the Commission Council intended to do.
3. That the petition of the State discloses no cause of action, no ordinance having as yet been adopted by the Commission Council affecting the rate of fare.

The argument of the State was that the Commission Council was without authority to abrogate what was termed "traction contracts," and that the Commission Council had no rate-making power, that power being vested exclusively in the State Public Commission.

Judge Parker, in his decision, took cognizance of only one of the exceptions of the city, namely, that the action instituted by the State was premature, the court holding that the city was well within its rights to negotiate with the New Orleans Railway & Light Company, and could not be prevented from adopting an ordinance affecting electric railway rates, unless the ordinance so adopted was illegal and *ultra vires*, when an appeal to the courts to restrain the city from enforcing the provisions of the ordinance would then lie.

At the time that the decision of the Supreme Court was rendered, denying the right of suspensive appeal to the injunction issued by the Civil District Court, Attorney General Coco was credited with the statement that he would abide by the opinion of the lower court and would not seek to further prolong the litigation. It is true that it was anticipated that the court would pass upon the validity of the authority which the city assumed as a rate-making power in the negotiations that were interrupted by the Supreme Court. This question is still left unaffected by the decision of the lower court. Judge Parker said in conclusion:

> Under this condition of affairs, the matter comes before me.
>
> Exceptions were filed, first, to the jurisdiction of the court; second, that the suit was premature, and, third, that the petition disclosed no course of action.
>
> The exception of prematurity, in my opinion, is well founded. There is nothing official as to what ordinance the Commission Council contemplates adopting, and an injunction will not lie, anticipating the legislative action of the Commission Council.
>
> Should the Commission Council adopt an ordinance which is illegal and *ultra vires*, it will then be time to appeal to the courts to enjoin the enforcement of such ordinance should it be illegal.
>
> The plea of prematurity is, therefore, sustained, and the rule *nisi* is recalled and plaintiff's suit is dismissed at its cost.

Judge Porter Parker on Dec. 30 granted Assistant State Attorney General Paul Sampoyrac an appeal to the State Supreme Court in the action brought by the State against the Commission Council, questioning its authority as a rate-making power and alleging it was about to enter into an agreement with the New Orleans Railway & Light Company for an increase in railway fares. As the lower court on Dec. 26 dismissed the application of the State for an injunction on the ground of "no cause for action," the question of prematurity will therefore figure in the appeal.

Some belief is expressed that the matter may be solved from quite an unexpected source during the coming week, for it is thought in well-informed legal circles quite unlikely that the State Supreme Court will seek to enjoin the city from doing what the State only presumes it intends to do. Those who are of this opinion hold that the Commission Council being a legislative body, as it were, it would be setting a very dangerous precedent for the court to interfere in a presupposed action which it is alleged or presumed the Commission Council intended to take. The lower court practically held that it could not do so until the Commission Council had acted.

Lower Wages in Effect in Dallas

The Texas Electric Railway put a reduced wage scale for all its employees into effect on Dec. 1. The wage reduction cuts $8,000 from the monthly pay roll.

The wage cut affects all the trainmen on the interurban lines, employees in all the offices of the company and employees of the electric railway lines in the cities of Waco, Denison, Sherman, Corsicana, Waxahachie and McKinney. While the cut varies for individuals, it will average about 7½ per cent. Shrinkage of more than $500,000 in passenger business since Jan. 1, 1921, is assigned as the cause for the reduction. This cut was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 26.

Information Lessens Hostility

In a report of its first year's work the Ohio Committee on Public Utility Information points out that through the work of the committee the public attitude of hostility toward utilities has changed to one of open-mindedness, the unjustifiable criticism and newspaper attacks have lessened and the newspapers are increasingly urging fair play for the utilities.

The committee, one of the first of its kind formed to disseminate information about utilities in a concerted manner, has succeeded, through weekly news bulletins, in having published in the 300 Ohio newspapers which it checked 921 solid newspaper columns of material. Of this, 107 columns were devoted to the electric traction industry. Through its speakers' bureau 6,000 people were told directly of the problems confronting the utilities, and the publicity given these speeches carried them to a far greater number of readers.

Looking to the future, the committee plans to expand the speakers' bureau, so that in each county of Ohio there may be at least half a dozen talks each year on utility subjects and that every large utility in the state may have at least two capable talkers on utility topics. Besides improving the news bulletin, it expects also to issue pamphlets for use in schools, colleges and universities describing the operation of each phase of the utility service, telling the history and the development of utilities, how they are and must be financed, their regulation, their relationship to the communities they serve and the problems that beset the operators.

"At the Point of the Bayonet" the Winner

The "short story contest" for former service men in the employ of the Kansas City (Mo.) Railways, arranged as a feature of the American Legion convention issue of the *Railwayan*, proved successful far beyond expectations. The contest confined the offerings to stories by ex-service men of personal experiences or of the experiences of others. Forty stories were submitted to be judged by the employees. Blanks had been sent to all divisions, on which the votes were to be recorded, ranking the six best stories of the forty printed in the convention issue of the *Railwayan*. Two or three hundred votes had been expected; there were 1,671 employees, however, who filed their votes, and every story printed received some votes. The six receiving the highest number of votes were the winners. Roy A. Potter, an employee at the shops, wrote the first-prize story, a record of his experience during a raid on German trenches, the title of which was "At the Point of the Bayonet."

An interesting feature of the war experience contest was that the interest of the hundreds of employees was entirely unselfish in their voting and reflected the strong morale and good feeling among the personnel of the railway organization.

A second contest similar in nature to the first is now under way. It has several angles of value. A definite subject has been designated: "Why the Kansas City Railways is one of the best organizations in the United States."

The contest is open to all employees.

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Playing Politics With Trainmen's Wages

Under a new ordinance proposed by the finance committee of the City Council of the Seattle, Wash., the trainmen operating the lines of the Seattle Municipal Railway will be placed on a monthly salary basis, instead of the present day wage.

Mayor Hugh M. Caldwell is opposed to the proposed monthly salary plan, declaring that it will lead to complications with the police and fire departments. He points out that being on a monthly basis, the trainmen would be in the same class with firemen and patrolmen and would naturally expect one day off in eight, as is the case with the two latter classes. This would mean a tremendous increase to the railway operating expenses.

On the other hand, the trainmen are paid time and one-half for overtime, and he considers it likely that the policemen and firemen will soon ask for this same form of payment. Mayor Caldwell charges the Council with directly evading the question of wage decreases for trainmen, "because of their influence and numbers." The proposed new salary ordinance for city employees reduces the wages of all other workers except the trainmen, and the proposed monthly plan means a virtual increase in their present salaries.

The finance committee has approved the ordinance and it will come up for an early vote by the City Council.

Wheeling Inclined to Go Slow on Bus Proposal

A representative of Council in every city where the Wheeling Traction Company operates will be asked by the City Council of Wheeling to meet and discuss a proposed reduction in fares suggested by C. P. Billings, vice-president and general manager of the Wheeling Traction company.

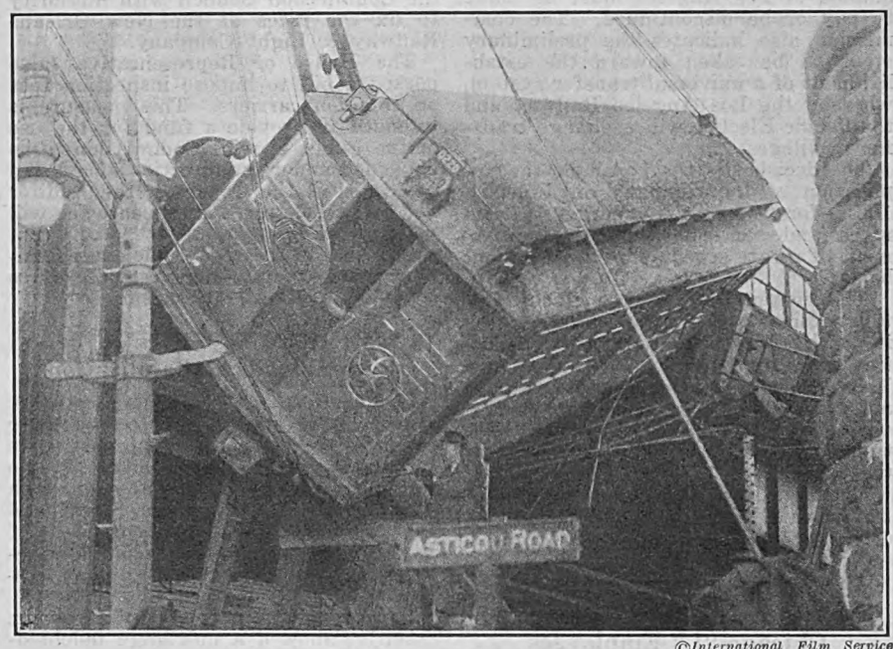
The decision to this effect grew indirectly out of the meeting of the City Council of Wheeling held to discuss the granting of a permit to the Ultimate Bus Company to operate buses over the streets of Wheeling. Members of the Council were unable to agree on any definite action. Attorneys George C. Beneke and James M. Ritz, representing the Ultimate Bus Company, addressed the meeting and the Wheeling Traction Company presented data as to its financial condition. Council then decided to appoint Dr. E. S. Bippus to represent Wheeling's Council at a meeting of all Council bodies in the vicinity of Wheeling where the Wheeling Traction company operates.

Mr. Billings told Councilmen Bippus, Otto and Tahey, who compose a committee appointed by City Council to investigate the application of the Ultimate Bus Company, that if the buses continue to operate, the traction company will have to discontinue, but that if a permit is refused the bus company, the Wheeling Traction Company will continue to give the best service possible, and that the prospects were that fares could be reduced. For instance, the fare to Bellaire would be made 25 cents for a round trip instead of 16⅔ cents one way if his idea was carried out. He also said he would like to see the fare on the other divisions reduced.

Following the talks of Attorneys Beneke and Ritz, members of Council discussed the conditions of the railway and the bus companies from all angles. It was suggested that a signed statement be made or that Mr. Billings be asked to make a statement in open Council that he will ask the Public Service Commission to grant permission to reduce fares and that his company would give better services and as soon as possible repair the streets of the city.

Elevated Car Falls Into Street

Two trains of the Boston (Mass.) Elevated Railway running empty collided in Forest Hills on Dec. 5. The force of the collision wrenched the body of one of the cars free from the forward truck, which fell into the street below while the car body remained suspended from the structure in the threatening position shown in the accompanying engraving.



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HOISTING BOSTON "L" CAR OUT OF STREET

If Money Comes Can Improvements Be Far Behind?

"There is a lot of difference between what you would do if you had the money to do it with, and what you are merely thinking about doing some day if the company can afford it." Thus spoke J. P. Barnes, president of the Louisville Railway, in discussing an article appearing in a local paper, which stated that the company was planning numerous improvements. Mr. Barnes said:

I merely discussed some of the things we would like to do. We would like to get away from hauling such heavy cars on our interurban runs, and replace them with cars of about half the weight. We'd use more one-man cars, and lighter cars, and might even use one-man cars on some interurban runs. By reducing weight we'd be able to reduce load on power station, and save considerable in operating expenses. Of course for years we've planned eventually to close down the Campbell Street power plant some day and enlarge the Riverside power plant to carry the entire load. We've even considered bus lines, bus trolleys, etc., but never seriously, as we've not been in position to do so.

Mr. Barnes admitted that most of the considering that was being done was of ways and means to reduce operating expenses, and still perform service, so that the company could make a little money, and give the common stock holders something in return for their investment, which has been a poor paying proposition for some years past.

Separation of Railroads from Power Companies Urged

Separation of the railroad companies from the power plants was advocated by S. C. Lindsay, engineer of the Puget Sound Power & Light Company, in an address recently. He maintained that the same power systems, which furnished the railroads could furnish power to the manufacturing plant and the farmer along the railroad route.

"For this reason it is much better that railroad companies confine themselves to the railroad business and obtain their power for railroad operation from companies who have specialized in the production, transmission and distribution of this commodity," said Mr. Lindsay.

The second great epoch in railroad history began in August, 1919, with the electrification of the Chicago, Milwaukee & St. Paul line between Othello, Wash., and Seattle and Tacoma, according to the speaker. The first began when the Union Pacific and Central Pacific lines were connected at Salt Lake City on May 10, 1869.

The Washington Water Power Company of Spokane supplies power for the Othello-Seattle-Tacoma line of the Chicago, Milwaukee & St. Paul from its plant at Long Lake. The Puget Sound Power & Light Company of Seattle also supplies the line from its power plant at Snoqualmie Falls. These companies are able to supply all additional water power needed for electrification of the other transcontinental railroads coming into Seattle. The two companies will use about 28,000 hp. of water driven generators to supply the Chicago, Milwaukee and St. Paul line.

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Uniform Mileage Basis Ordered

The California State Railroad Commission on Dec. 24, 1921, handed down its decision on the fare application of the Pacific Electric Railway, Los Angeles. The company has announced that it will abide by the order, which is effective twenty days after Dec. 24, and on Dec. 31 President Paul Shoup stated that the new rates would go into effect on Jan. 1.

The decision establishes a uniform mileage scale which amounts to a substantial reduction in interurban fares and wipes out all inequalities in their computation. It also establishes two 6-cent fare zones in the city of Los Angeles with a 10-cent through fare, eliminates blanket beach rates except on week ends and holidays, and declares that local service in towns outside of Los Angeles must be made to pay or be discontinued. The commission also indicates the preliminary steps to be taken toward the establishment of a universal transfer system, whereby the Los Angeles Railway and the Pacific Electric will exchange transfer privileges.

The decision is the result of the application of the company on June 11, 1921, for a complete survey of its rates and service and the establishment of a rate schedule on a permanent basis.

The commission order includes certain clauses relating to improvements in track and service and the construction of a tunnel on the Hollywood line. These clauses the company has also accepted in an announcement that it will spend $2,600,000 in constructing a tunnel and will add fifty new cars for the service.

The details of the commission's decision will be given in the ELECTRIC RAILWAY JOURNAL for Jan. 14.

Economics Lecture Course for Chicago "L" Employees

The first of a series of lectures on the financial and economic side of the electric railway business for the supervisory forces of the Chicago Elevated Railways has been arranged by President Britton I. Budd. The lectures are to be given by Prof. Ralph E. Heilman, dean of the School of Commerce, Northwestern University, whose subject was "Franchises" at the first lecture, given on Oct. 20.

There were 300 employees in attendance. The idea of the course is to broaden and develop the employees for more useful service to the company and for their contact with the public.

In stating the objects of the course to those assembled at the opening of the first meeting, Mr. Budd said:

> In these days of regulation of utilities under the laws of the state, all of our affairs are public and it is therefore essential that every man in a supervisory capacity should have a thorough understanding of the financial side of the company's affairs, not only as a matter of giving more efficient service to the company and being able to talk intelligently with the men under him, the public, and with his neighbors about the company's affairs, but also to prepare him for greater responsibilities.
>
> There was a time in the railroad business when a man only had to master the details of his particular job, but the 1921 model is of a different character. He not only has to have knowledge of the practical side of the job in his charge, but he has to know about costs of the work he is doing and the relation to the total cost of operation of the department he is in. It is necessary for him to have the ability to analyze figures and statements to further his promotion. We are surrounded by laws and regulations covering rates, service and accounting, all of which relate back to the financial side.
>
> In our organization I wish to develop material for leadership. I want the young men to feel that there is opportunity and I want them to feel that they are making progress, either in experience or position, and that time spent in the organization is time well spent. I want the older men to fight against being too satisfied with themselves, because of the danger of getting into a rut.

Wants Rate-Making Power in Commission's Hands

The House of Representatives of the Louisiana General Assembly has passed a bill vesting in the Commission Council of New Orleans rate-making power in dealing with public utilities.

The purpose of the bill is to clothe the Commission Council with authority to fix the rates of the New Orleans Railway & Light Company.

The House of Representatives also passed a bill to impose inspection fees on common carriers. This measure is intended to provide a fund for the use of the Public Service Commission to be expended under the direction of a board composed of the Governor, the Auditor and the Treasurer. The license fee will yield, it is thought, about $30,000 annually, a sum deemed sufficient to employ rate experts to investigate rates of public service corporations.

Recommends Rehabilitation

Restoration of the electric railway system at Lafayette, Ind., to its former condition as an operating property was recommended by the receiver of the Lafayette Service Company through abandonment of the Owen Street and fair ground lines, the purchase of twenty one-man cars and complete rehabilitation of the entire railway system.

The financial report of R.W. Levering, receiver, showed a mortgage indebtedness of $225,000, a claim of security holders for $7,952 and a balance of about one-half of the debt covering the railway company's share of constructing the Main Street bridge and approaches. It showed also a deficit of $11,060 for the year's operation of the 18.66 miles of track which comprises the city system. An estimate for the operating expenses for the coming year with the service, new equipment and changes proposed placed the net income of $34,965.

Included in the proposed plans for the lines is the elimination of bus competition across the Main Street levee, the sale of the present power plant and the purchase of energy. The cost of purchased power would not exceed 2.52 cents per kilowatt-hour, which is less than the expense of generating energy for the company at its own plant.

The present cash fare of 7 cents, or four tokens for 25 cents, is used as the basis of computing revenue in the receiver's report. The cost of rehabilitation, which is placed at $110,000, exclusive of the cost of construction of a new substation and the cash payment of new one-man cars, which would bring the total to $165,000, does not include paving work. This the company is under contract to keep in order. The company also will have to pay for paving of South Ninth Street and Owen Street when the tracks are removed under the present plan.

Purchase Offer Refused

With bondholders and bondsmen failing to consent to the sale of the Ashtabula Rapid Transit Company property to the city of Ashtabula, Ohio, for $150,000 and with the city officials and citizens favorable to no higher price, negotiations between the two parties apparently are at a standstill.

At a recent meeting of bondholders and bondsmen in Cleveland relative to a discussion of the sale price of $150,000 there was no definite decision made to sell the property at this figure, nor was there a decision made against that figure. In November citizens defeated a proposal to buy the property for $197,000.

Certain of the stockholders favor reorganization of the company.

Erie Canal Channel Approved for Transit Line

Unanimous approval of the proposed use of the Erie Canal channel for an industrial and rapid transit railroad was expressed at a hearing in Rochester, N. Y., of the public works and finance committees of the Common Council. Plans for the new street which is to be opened to South Avenue over the subway were discussed, which included suggestions that the street be kept free from street railway tracks. The space could be advantageously used for automobile parking, it was stated, to relieve congestion elsewhere. The street is to be not less than 52 ft. wide between curbs, according to present plans, and in addition the sidewalks are to be 14 to 20 ft. in width. Overhead trolley system will be used for the electric locomotives instead of the third rail, and there will be three main stations, one at South Street, one at City Hall and one north of Main Street, near Oak Street.

The total cost of $1,800,000 will be divided between the New York State Railways, which will pay approximately $45,000; the benefited property owners, who will pay $325,000, and the city at large, which will pay the remainder of $1,430,000.

Ibanez Favored in Louisville

The Louisville (Ky.) Railway recently chartered an electric car to the Majestic Amusement Company for use in advertising "The Four Horsemen," a film play showing at the Majestic Theater. This is probably the first time in the history of the city that an electric car has been chartered and used steadily for several days in advertising anything.

The company does not permit any banners or advertising matter to be attached to the outside of any of its cars. In this case thin paper signs, with huge red letters, advertising the show, were placed inside of the car, showing well in daylight, and equally well at night with the light shining through the paper.

Under rates of the company cars are chartered at the rate of $11 each for the first two hours, and $4 for each hour in twenty-four thereafter. This car was chartered for five hours per day for three days, or $34 a day, the total charge being $102. The company wouldn't mind if quite a bunch of advertisers would run cars over its lines in the downtown district even, at that sort of rate.

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Financial and Corporate

Bond Issue Approved

Vote at Columbus, Ohio, Regarded As Expression of Confidence in Local Management

The stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, on Dec. 31 voted to approve the proposed issue of $5,000,000 of twenty-year 6 per cent bonds for the purpose of retiring old bonds. The vote was more than five to one.

The vote on the proposition was one of the largest ever cast by stockholders of this utility on any proposal submitted to them. A total of 78,501 shares was represented in the balloting out of the 118,643. The acceptance of the financing plan by the stockholders is looked upon as a gratifying expression of confidence in the administration of the company's affairs by President Charles L. Kurtz and a home management.

In a statement issued following the balloting President Kurtz declared that the action of the majority stockholders brings near the culmination of the company's "endeavor to render a service that will meet the full needs of the public." He directed attention to the fact that the plans thus approved call for the immediate retirement of the $3,000,000 of three-year 8 per cent bonds outstanding, with a saving of $41,000; the retirement of the last $232,000 of the old Central Market bonds, and the paying off of notes held by Columbus banks amounting to $235,000. It also makes possible the cancellation of $396,000 of notes held by the General Electric Company and current bills in the amount of $590,000.

Long Debate at Meeting

The contract for the sale of the bonds has been awarded to Harris, Forbes & Company, New York, who have sold the securities at 93 per cent of par, the transaction having been approved by the board of directors of the Columbus company and by the Ohio Public Utilities Commission.

At the meeting of the stockholders on Dec. 31 opposition was voiced by the Clark interests through their attorney, J. M. McCarty, and W. H. Sawyer, vice-president, and by a single director of the Columbus company, William A. Gill. The opposition maintained that the floating of the bond issue is untimely and that money will be cheaper later; that there was no real need of a new financial arrangement just at this time.

In reply to the opposition, former Attorney General Edward C. Turner, legal adviser for the Columbus Railway, Power & Light Company, praised the present management of the line, and read correspondence which he said tended to show that the Clarks had threatened company officials with opposition to the plan of finance unless a "satisfactory arrangement" could be arrived at over the Slaymaker accounting suit against the Clark company, now pending in the Common Pleas Court of Franklin County, Ohio, and in which a master commissioner's finding of some $300,000 against the Clark company and in favor of the Rail-Light Company is to be passed upon soon. Attorney Turner also read a telegram from the Clark company in which the latter declared that no money has been received to pay for coupons due on Jan. 1. To meet these coupons payments the Columbus company was compelled to draw from the banks almost all its available cash and forward it to Philadelphia.

Attorney McCarty told the stockholders that the affairs of the company had been administered economically under the Clark régime, to which Mr. Turner replied that when the home management of the company took over the control from the Clark interests there was no surplus, while under the management of President Kurtz and his associates in Columbus a surplus of approximately $1,900,000 was built up. The debate between the opposing interests occupied a period of more than three and a half hours, preceding the balloting by stockholders at the regular meeting.

Intense interest was manifested in the election by Columbus residents and by stockholders of the company in view of a circular letter sent out by the Clark interests under date of Dec. 22, to all the stockholders, voicing opposition to the proposed bond issue. In a counter move President Kurtz addressed a statement to the stockholders through the advertising columns of the daily newspapers, directing attention to the Clark circular and the forthcoming meeting. Mr. Kurtz declared that:

> Although indirectly denied in the circular letter, the purpose is thinly disguised that E. W. Clark & Company, lately managers of your property, again desire to assume the management and to conduct the affairs of the company in the old way and by doubtful methods which have been made the subject of litigation, and which have been frowned upon by the court. There is nothing in the circular letter sent out by E. W. Clark & Company, Philadelpha, requiring any answer by the management.

Reasons for Consolidation Set Forth in Brief

The contentions of the Indiana Electric Corporation in favor of its application to issue approximately $18,500,000 in securities for the purchase of seven public utility plants in Indiana, including the property of the Indiana Railways & Light Company, at Kokomo, are set out in a brief filed with the Public Service Commission by attorneys for the corporation.

The brief contends that the physical property of the seven concerns is worth $18,726,773 and that material and supplies and working cash capital amount to $650,000, making a total valuation of $19,376,773.

The earnings for the year ending Oct. 31, 1921, were $1,472,722, according to the brief, while the fixed charges of the new corporation would amount to $943,550 annually, leaving $529,172 for depreciation and common stock dividends.

The brief states at length the benefits which are expected to be derived from the consolidation.

Reorganization Planned

Electric Bond & Share to Have Hand in American Cities Company's Affairs

The committee representing the holders of the 5 and 6 per cent collateral trust bonds of the American Cities Company has announced that it has approved and adopted a plan and agreement for the reorganization or readjustment of the American Cities Company. A copy of the plan is being sent to each of the holders of certificates of deposit of the bonds under the deposit agreement dated Jan. 15, 1919.

Under the plan, a new company known as the National Power & Light Company has been organized in New Jersey. The shares of the company's capital stock are without par value and are divided into preferred and common stock. The preferred stock is entitled, in preference to the common stock, and limited, to dividends of $7 a share per annum, cumulative from Jan. 1, 1923. It is redeemable after three years upon the vote of not less than a majority in interest of the outstanding common stock.

The National Power & Light Company will issue fifty-year 7 per cent income bonds, which are to be subject to the prior payment of the principal and interest of all indebtedness and contractual obligations of the company now or hereafter outstanding. Interest accrues on these bonds from Jan. 1, 1922.

The companies controlled by the American Cities Company were: Birmingham Railway, Light & Power Company, Houston Lighting & Power Company, Knoxville Railway & Light Company, Little Rock Railway & Electric Company, Memphis Street Railway and New Orleans Railway & Light Company. The Birmingham, Memphis and New Orleans companies are in the hands of receivers. The New Orleans company will be excluded from any future plans of the committee.

The plan contemplates that the Memphis Gas & Electric Company will become part of the undertaking. The development, financing and engineering of the new company and its subsidiaries will be in the hands of the Electric Bond & Share Company.

Under the terms of the plan holders of certificates of deposit of American Cities Company 5 and 6 per cent collateral trust bonds will receive 55 per cent of the principal amount of the bonds represented by each certificate of deposit in fifty-year 7 per cent income bonds, 25 per cent in cumulative preferred stock and 35 per cent in common stock of the new company, the shares of stock being treated as having a par value of $100 for the purpose of applying these percentages.

The National Power & Light Company will offer to the holders of preferred stock of American Cities Company the right with respect to every full twenty shares of stock to purchase a block of securities of National Power & Light Company, consisting of a fifty-year 7 per cent income bond for $100 principal amount and seven shares of common stock for $242.50 plus accrued interest from Jan. 1, 1922, on the income bond. Electric Bond & Share Company and Isidore Newman & Son have agreed to purchase sufficient of said blocks so that the new company will receive a total of $2,000,000.

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$160,015,860 in Maturities

Thirty-seven Per Cent of the Total of $432,934,890 of Utility Maturities in 1922 Falls to Electric Railways

Public utility securities falling due for payment during 1922 aggregate $432,934,890 against $305,110,350 in 1921 and $196,296,800 in 1920. Of the total for all the utilities the amount maturing in the electric railway field in 1922 is $160,015,860. In 1921 railway maturity amounted to $207,-617,530.

The heaviest maturities in the railway field are in New York City. Among these issues are the Interborough Rapid Transit Company's $39,199,000 one-year extended 8 per cent notes due September, 1922 and the Brooklyn Rapid Transit Company's $18,000,000 6 per cent receiver's certificates.

Below is given in detail as compiled by Dow, Jones & Company the various electric railway issues of more than $200,000 maturing in 1922.

Corporation	Rate	Amount
January		
Columbus Ry., Pow. & Lt. notes...	8	$2,500,000
Little Rock Ry. & El. 1-yr.....	8	700,000
United Gas & Electric 1st.....	5	396,000
Springfield & Eastern Ry. 1st.....	5	330,000
Central Market St. Ry. 1st.....	5	325,000
Eastern Mass. Street Ry. ref.....	6	300,000
New Bedford & Onset Ry. 1st.....	5	280,000
Virginia Ry. & Power notes.....	6	250,000
Minneapolis St. Ry. joint cons.....	7	5,000,000
January total.....		$10,081,000
February		
Bklyn. Rapid Tr. rec. ctfs.....	6	$18,000,000
American Rys. 3-year notes.....	7	3,000,000
West End Street Ry. deb.....	5	2,700,000
Wisc.-Minn. Lt. & P. 1-yr. nts.....	8	1,000,000
Detroit & Pontiac Ry. 1st.....	5	500,000
Washington Water P. notes.....	7	3,000,000
February total.....		$28,200,000
March		
Public Serv. of N. J. cv. notes.....	7	$12,442,600
Federal Light & Trac. deb.....	6	1,500,000
Galveston-Houston Elec. notes.....	7	1,500,000
Canton-Akron Railway 1st.....	5	1,145,000
Albany South R.R. 1-yr. nts.....	7	550,000
Middle West Utilities F. nts.....	6	300,000
Oakland, San L. & Hay El. Ry.....	6	250,000
Richland Pub. Service notes.....	7	850,000
Charleston Interurb. R.R. nts.....	6	450,000
March total.....		$18,987,600
April		
Denver Tramway coll. tr. nts.....	7	$2,500,000
Jackson Lt. & Trac. 1st.....	5	930,000
Dayton, Cov. & Piqua Tr. 1st.....	5	490,000
Ironwood & B. Ry. & Lt. notes.....	7	294,000
Dallas Electric Corp. coll. tr.....	5	282,000
April total.....		$4,496,000
May		
Monongahela Val. Tr. 1-yr. notes...	8	$2,000,000
Montreal St. Ry. sterl. deb.....	4½	1,926,260
Penna. & Mahoning Val. Ry. 1st....	5	1,559,000
Freeport Ry., Lt. & Power 1st.....	5	260,000
Commonwlth. P., Ry. & L. notes....	7	250,000
Penna.-New Jersey R.R. 1-yr. notes.	6	250,000
May total.....		$6,245,260
June		
City and Suburban Railway 1st.....	5	$3,000,000
Ind., New Castle & East 1st.....	6	1,200,000
Nova Scotia Tram. & P. notes.....	7	1,000,000
Berkshire Street Ry. 1st.....	5	800,000
Chattanooga Ry. & Lt. 1-yr. notes..	8	750,000
W. Penn. Tr. & Wat. Power notes...	7	400,000
June total.....		$7,150,000
July		
Union Trac. of Indiana 1st.....	5	$4,623,000
Cinc., Newport & Cov. Ry. 1st.....	5	2,850,000
Columbus Elec. 3-yr. notes.....	6	1,750,000
Cass Ave. & Fair Grounds Ry. 1st...	4½	1,640,000
Steinway Railway 1st.....	6	1,500,000
Clev., Painsv. & Ashtabula R.R.....	5	1,000,000
Pitts. & West End Pass. Ry. 1st.....	5	343,000
Vicksburg Light & Traction deb.....	6	278,000
Hamilton & Linden El. Tract.....	5	250,000
Concord, May & Hud. Ry. 1st.....	5	230,000
Ottawa Electric Railway 1st.....	4	400,000
July total.....		$14,864,000
August		
Montreal St. Ry. sterl. deb.....	4½	$584,000
Detroit United Ry. 1st coll.....	8	500,000
United Rys. & El. of Balt. notes.....	6	3,000,000
Unit. Rys. & El., Balt., cv. notes....	5	1,528,000
August total.....		$5,612,000
September		
Interborough R. T. ext. notes.....	8	$39,199,000
Manila Elec. Ry. & Light notes.....	7	1,500,000
Tri-City Railway 1st.....	5	1,375,000
Worc. & Southbr. St. Ry. 1st.....	4½	500,000
September total.....		$42,574,000
October		
Rockford & Interurban Ry. 1st.....	5	$1,705,000
Pueblo & Suburb. Tr. & Lt. 1st.....	5	1,697,000
Bangor Ry. & Elec. cv. notes.....	6	250,000
October total.....		$3,652,000
November		
Brazilian Trac., Lt. & P. notes.....	6	$7,500,000
Manchester Tr., Lt. & P. notes.....	6	1,750,000
Montreal Street Ry. deb.....	4½	764,000
Central Crosstown R. R. 1st.....	6	250,000
November total.....		$10,264,000
December		
Tol. Trac., Lt. & Power deb.....		$3,000,000
Toledo Trac., Lt. & Power 1st.....	7	2,500,000
Portland Ry., Lt. & Power notes.....	7	1,000,000
Sandw., Winds. & Am. Ry. cons.....	4½	600,000
Hagerst. & Fred. Ry. 1-yr. notes....	7½	540,000
Wilkes-B. & Wyo. Valley Tr. clt.....	5	250,000
December total.....		$7,890,000
Public utility bonds and notes maturing in:		
January.....		$10,081,000
February.....		28,200,000
March.....		18,987,600
April.....		4,496,000
May.....		6,245,260
June.....		7,150,000
July.....		14,864,000
August.....		5,612,000
September.....		42,574,000
October.....		3,652,000
November.....		10,264,000
December.....		7,890,000
Total electric railway maturities.....		$160,015,860
Total public utilities maturing in 1922		$432,934,890

Agreement on Receivership Terminates Litigation

A friendly agreement has been reached with respect to the receivership of the Ephrata-Lebanon Traction Company, Lebanon, Pa., and the Ephrata-Lebanon Street Railway so that the work of re-establishing the railways will now go forward uninterrupted. The Ephrata & Lebanon Traction Company operates the property of the Ephrata & Lebanon Street Railway.

The difficulty arose over the appointment of a receiver for one by the United States District Court and the appointment of a different receiver in a local court for the other concern. Recently the contending lawyers appeared before Judge Witmer in the United States District Court at Harrisburg, and argued the legal points involved in the two receiverships.

Application had been made for an order vacating the receivership created by Judge Witmer some months ago in the appointment of Henry A. Albin, superintendent of the road, as a receiver for the traction company. It was suggested that that receivership be joined with the one for the railway company which had later been applied for in the local courts by Harvey Steckbeck, a local creditor, represented by S. P. Light, Esq., and in response to which Judge Henry appointed Walter C. Graeff, Esq., as receiver.

Under the agreement of counsel, in the presence of Judge Witmer, Mr. Albin's Federal receivership will continue, and Attorney Walter C. Graeff, Esq., and Henry Albin will be co-receivers of both properties.

Purchase Terms Restated

Misunderstanding of the terms under which the city of Toronto, Ont., will take over the lines of the Toronto Suburban Railway within the city has led to a statement being issued by the officials of the Hydo-Electric Power Commission setting forth the facts. The statement as now made is that:

The Hydro-Electric Power Commission buys from the government the entire Toronto Suburban System by assuming the outstanding bonded indebtedness, amounting to $2,628,000. It is proposed to spend $352,-000 on reconstructing the lines outside the city. This latter sum is to be financed by the issue of bonds by the commisssion to the amount of $150,000 and selling the lines within the city for $202,000.

The amount of bonds to be issued by the commission is $2,628,000, plus $150,000, making a total of $2,778,000. The obligation which the city assumes is $2,778,000, not this amount plus $202,000.

The city does not pay interest at the rate of 6 per cent, while the Hydro Commission issues its bonds at 4½ per cent. The city's bonds are only collateral security and the city pays interest only on $350,000.

Transit and Power Bills to Come Before New York Legislature

The Legislature of New York met on Jan. 4 and organized and received the Governor's message. Bills were introduced in the Senate only. The Assembly bills will go in next on Jan. 11.

A considerable number of public service commission bills have been prepared and are ready for introduction. There is such a mass of legislation at the present time, some of which has been introduced in the Senate officially, and some in the Assembly awaiting its first reading on Jan. 11 that it is impossible to analyze it for publication at this time.

The Governor in his message recommends the development of the surplus waters of the barge canal, with immediate attention to the development of Crescent dam and Vischer Ferry, where an expenditure of approximately $1,-000,000 should be made immediately available. In this respect the Democratic minority has prepared for introduction a bill which is virtually the Democratic hydro-electric measure of 1913 and repealing the conservation water power bill of last year, which will in the offset steal the thunder of the message. On the other hand the administration is to introduce amendments to its water power bill of 1921.

The Democrats are proposing to abolish the transit commission in New York City and to create separate public service commissions in each of the first and second class cities, and to continue the present public service commission as a state function over what is left, except in the city of New York, where the Board of Estimate and Apportionment would name a transportation department for the city of New York.

Ottawa Rejects Municipal Ownership

The questions of municipal ownership and service-at-cost were overwhelmingly defeated at the polls by Ottawa electors on Jan. 2. The vote strongly favored an extension of the company's franchise. The official figures follow:

For municipal ownership, 6,003; against, 8,430.

For extension of franchise, 8,415; against, 6,070.

For service at cost, 3,345; against, 10,639.

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Orders Third-Rail Line Sale

Federal Judge Evan A. Evans on Dec. 23, 1921, ordered the sale of the third-rail division of the Aurora, Elgin & Chicago Railroad, Aurora, Ill. Though no date was set for the sale, it is stated that in all probability it will take place about March 1. This order separates the third-rail line from those in the Fox River division. The bondholders of the third-rail division are willing to purchase the line and have agreed to issue $1,000,000 of bonds and to invest the proceeds from the sale of these bonds in new equipment, new property, additions, extensions and improvements. This was the statement of Attorney B. P. Alschuler, who is representing Judge Evans.

Municipal Railway Traffic Increasing

According to D. W. Henderson, general superintendent of the Seattle (Wash.) Municipal Railway, the number of passengers on the municipal lines is steadily increasing, due, it is believed, largely to increasing industrial activity in the city and improvement in employment conditions. Figures prepared by Mr. Henderson show that there was a gain of 6,670 passengers in November over September and a gain of 5,301 passengers in October over September. Mr. Henderson said the increases are most noticeable on lines operating into the south industrial district, where more workers are being carried daily. The revenues for November were $514,248, and the total number of pay passengers 6,670,431, with a daily average of 268,938.

Market Street Railway Ready to Consider San Francisco's Offer

In reply to the inquiry which the Board of Supervisors of San Francisco, Cal., addressed to the Market Street Railway recently, Mr. Von Phul, president of the company, has replied that the sentiment of the stockholders is that "if the municipality desires to buy the properties it should have an opportunity to do so."

Mr. Von Phul's letter concludes with the suggestion that "representatives of the municipality be appointed by you (board of supervisors) to meet with representatives of this company to discuss values and details for the possible acquisition of the properties and to formulate a plan to be first submitted to the honorable board and, if approved by you, submitted to the stockholders of the company, and if approved by them, in turn submitted to the voters."

$23,152 Deficit on Seven and a Half Cent Fare

During the month of November the first month of the present 7½ cent fare period, the Cincinnati (Ohio) Traction Company had a deficit of $23,152, not including what would have been due the city on franchise tax, had not the tax been deferred.

This is shown in a financial statement submitted by the company to William Jerome Kuertz, Street Railway Director. The gross earnings from all sources during the month totaled $664,033; the total expenditures $687,186. The company was entitled to an earning of $33,913 on capital for the month, but received only $10,760. Director Kuertz said that increased patronage due to Christmas shopping would show a big increase in the earnings for December—probably enough to offset the November deficit.

Receiver Reports on Finances

The financial report of the receiver of the Lafayette (Ind.) Service Company shows for the period from Oct. 1, 1920, to Sept. 30, 1921, a deficit of $11,060. Details of the operating revenue and expenses are as follows:

Operating Revenue.	
Passenger service	$189,107
Freight service	3,409
Rent of tracks	11,444
Car privileges	747
Mail, express and miscellaneous	901
Energy sold	68,909
	$274,517
Operating Expenses	
Operating way and structures	$5,530
Equipment	17,076
Power	108,575
Conducting transportation	90,640
General and miscellaneous	25,694
Taxes	8,062
	$285,577

Boston Elevated Doing Well

According to the *Wall Street Journal* the Boston (Mass.) Elevated Railway for the calendar year 1921 will show operating revenues of about $33,200,000, and balance, after rentals and interest, of about $3,443,000 available for dividends on West End and Boston Elevated stocks. The road has earned this calendar year a surplus after all dividends of about $426,000. Despite the undoubted depression in industry, plus the further adverse effect upon receipts of the opening up of 5-cent fare routes, the Boston Elevated Railway in the 1921 year will come within $550,000 of equaling the largest gross income total in its history. Operating revenue for 1920, the record year, was $33,750,860.

Issuance of Receiver's Certificates Disapproved

Judge A. B. Anderson, Indianapolis, in the federal court, has declined to approve a plan presented by R. W. Levering, receiver, for the rehabilitation of the Lafayette (Ind.) Service Company, by the issuance of receiver's certificates. The plan was opposed by bondholders who have brought a foreclosure suit in the federal court against the service company. Judge Anderson said that he did not wish to approve the receiver's plan unless there were agreement between the receiver and the bondholders.

The receiver suggested the sale of eighteen and one-half acres of land east of the Soldiers' Home at Lafayette, and the sale of the company's power plant for $50,000. He spoke of jitney competition between Lafayette and West Lafayette, saying that the jitneys were carrying 50 per cent of the passengers between the two places and were seriously cutting into the most remunerative business falling to the service company. He said he had asked the City Council of Lafayette and the town board of West Lafayette to pass anti-jitney ordinances.

The Real Estate Trust Company, Philadelphia, trustee, representing the bondholders, filed an answer to the receiver's petition objecting to the plan as being one not likely to bring a fair return on the property.

Financial News Notes

Loss Reported in Hamilton.—Since Jan. 1, the Cincinnati & Dayton Traction Company, Hamilton, Ohio, has lost $43,083, while in the past years the city lines averaged a profit of $30,000. The reasons for the loss as given by G. P. Sohngen, receiver of the property, were poor equipment, bus competition and general business depression.

$2,700,000 of Bonds Offered.—Lee, Higginson & Company, Boston, Mass., are members of a syndicate offering $2,700,000 of five-year 6½ per cent gold bonds of the West End Street Railway, which is to be consolidated with Boston Elevated Railway on June 10, 1922, under the provisions of an act passed in 1911. The bonds are dated Feb. 1, 1922, and are due on Feb. 1, 1927. They are issued to refund a like amount of bonds which mature on Feb. 1, 1922.

$3,800,000 of Refunding Bonds Offered.—Halsey, Stuart & Company, Inc., New York, N. Y., are members of a syndicate which is offering for subscription $3,800,000 of first and refunding thirty-year 6 per cent gold bonds of the San Antonio (Tex.) Public Service Company. The bonds are known as Series "A," due Jan. 1, 1952, The offering price is 98½ and interest yielding about 6.10 per cent. The management of the company is under the direction of the American Light & Traction Company.

$79,108 Gain in November.—The report of the Third Avenue Railway, New York, for November and five months ended Nov. 30, shows operating revenues of $1,139,368, an increase of $79,108, while the operating income was $205,661, showing an increase of $84,063. The net income, after deducting fixed charges, including full interest on the adjustment income 5 per cent bonds, was $6,460, compared with a net deficit of $81,801. For the five months ended Nov. 30 the operating revenues were $5,946,603, showing an increase of $306,040, while the operating income was $1,027,572, an increase of $285,669. The net income, after deducting fixed charges, including the full interest on the adjustment income 5 per cent bonds, amounted to $19,321, compared with a net deficit of $285,108.

Earnings Improve at New Orleans.—Announcement is made that the net earnings of the New Orleans Railway & Light Company, New Orleans, La., for August, 1921, were $222,002. This amount is exclusive of operating expenses, taxes, and the renewal and replacement reserve; and hence represents a return of 6 per cent on the valuation of $44,770,000, placed upon the property of the company under the Maloney plan of settlement, to which the Commission Council of New Orleans is committed. The September net earnings were $255,036, a return of 6.8 per cent. The report carries with it the announcement that the new equipment for the power house and rearrangement for the electric light and power wires will cost approximately $1,140,000. An additional sum of $545,000 is to be spent for the reinstallation of the distributing system.

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Traffic and Transportation

Traffic Commission Appointed in Philadelphia

A traffic commission composed of men active in the motor vehicle and business fields has been appointed, at the suggestion of Mayor Moore, of Philadelphia, Pa., by Alba B. Johnson, president of the Philadelphia Chamber of Commerce. The commission will study the problems of handling vehicular traffic and suggest necessary legislation to improve conditions. It will be of an advisory character.

The commission is composed of David Kirschbaum, chairman; G. Herbert Taylor, who is chairman of the Chamber of Commerce Good Roads Committee; Walter Y. Anthony, Kane S. Green and Howard S. Roberts, of the same group; Elwood B. Chapman, of its Municipal Affairs Committee, and James Collins Jones, legal adviser of Chamber of Commerce.

Recently the Chamber of Commerce asserted that the handling of matters pertaining to traffic was in hopeless confusion and that only by reappointment of a traffic commission by Mayor Moore for the purpose of outlining and recommending a complete new set of rules for traffic regulations, with the necessary legislation noted, could conditions be improved.

Mayor Moore then wrote to Mr. Johnson the request that he name the commission to undertake this work. All of the members of the new body have been studying the city's traffic problems for years. As members of the two committees handling various aspects of this subject, they are thoroughly familiar with conditions here and in other cities. They will conduct conferences with police officials, engineers, motor vehicle men, electric railway experts and others so that all viewpoints can be considered.

Among the questions placed before the commission are parking, the one-way street, congestion around City Hall, designation of special streets for truck traffic and methods for safeguarding pedestrians.

When the commission has completed its studies and compiled its recommendations, together with the necessary ordinances to carry through the work, they will be presented to Mayor Moore for introduction into Councils if that course is necessary.

Early last year the Chamber of Commerce drew up an act covering this subject, and it was introduced into the Legislature, but failed to pass.

Increase in Receipts Under Five-Cent Fare Recorded

The Norwalk Division of the Connecticut Company has for the first time recorded an increase in receipts under the 5-cent fare trial period, the week of Dec. 11 showing a gain of $71 over the last week of the 10-cent fare, according to figures submitted to the Public Utilities Commission by Lucius P. Storrs, president of the Connecticut Company. Other figures show that the receipts in Bridgeport, Conn., are also gradually increasing under the 5-cent fare. "This is very encouraging," declared Richard T. Higgins, chairman of the Public Utilities Commission. "In the original order calling for a reduced fare it was pointed out that receipts were apt to increase rather than decrease under the new rate," continued Mr. Higgins.

96 Out of 100 Have Nickels Ready

Passengers using the stations of the Interborough Rapid Transit Company, New York, N. Y., where the turnstiles have been installed have formed the habit of carrying nickels, and the outgoing passengers have fallen as naturally into the habit of using the gates at the sides while the passengers entering the tubes make use of the middle gates. Tabulations made at a subway station where the turnstiles have been in use for some months show that now only four persons in a hundred go to the booths for change, where in times past long lines grouped before the windows caused delays. The other ninety-six persons carry their own nickels.

Elgin Cars Still Operate

While Mayor Arwin E. Price of Elgin, Ill., under direction of the City Council, has asked Bion J. Arnold, president of the Elgin & Belvidere Electric Railway, to show cause why the company cars are operating in the city without a franchise, and the Council has passed a resolution permitting the Aurora, Elgin & Chicago Railroad to operate its cars only for a "reasonable time," the committee of eighteen is still attempting to bring the Fox River Valley trouble to a satisfactory solution. The franchises expired on Dec. 10.

Federal Judge Evan A. Evans has presented to the committee, representing the towns through which the Aurora, Elgin & Chicago Railroad operates, what he considers the essential points in a contract between any or all of the cities and the company. They include the elimination of payments on pavements to be laid in the future except as already assessed against the company; payment by the traction company for all damage to pavements that may result from its use; elimination of all annual franchise payments, and elimination of street sprinkling.

The cities of Geneva, St. Charles, Batavia and Dundee wish to keep the franchises which they now have with the traction company, which do not exempt the company from paving payments. The company claims that traffic in these smaller towns is not sufficient to pay for the paving expenses.

Attorney Alschuler representing the company, announced that the company is considering a plan to reduce the rate of fare to regular riders approximately 1½ cents a ride, by keeping the straight fare at 10 cents for casual riders but selling tickets to regular riders at the rate of seven for 50 cents. This plan, he said, would be feasible only under an ordinance such as suggested by Judge Evans. The company is operating on a 3-cent per mile basis under an injunction issued in Judge Landis' court.

Free Fare Zone Eliminated

$400,000 Is Expected to Be Added Annually to Twin City Revenue Under Court Order

The free fare zone on car lines betwen St. Paul and Minneapolis will be abolished on Jan. 7. This action is expected to add between $250,000 and $300,000 to the revenue of the St. Paul lines and $150,000 to the Minneapolis lines annually.

The order follows a decision by Judge F. M. Catlin of the Ramsey County District Court making permanent an injunction against a 7-cent fare instead of 6 cents. Judge Catlin held the zone illegal. This means passengers traveling to St. Paul will pay a second fare at the city limits instead of at the half way point, as at present, at Snelling Avenue about 2 miles inside the St. Paul city limits.

The company is fortified by the Brooks-Coleman legislative act which placed determination of electric railway rates with the Minnesota Railroad & Warehouse Commission, and which specifies one full fare for each city.

The move was made by the railway as a measure toward saving the St. Paul City Railway from bankruptcy.

This neutral zone was established by a resolution adopted March 4, 1905, by the St. Paul Council, and accepted by the railway with the reservation of right to withdraw this acceptance.

Vice-President T. J. McGill said:

The elimination of the free or neutral zone was necessary in view of the decisions of J. C. Michael and Frederick M. Catlin, of the District Court of Ramsey County.

The St. Paul City Railway's revenues from November, 1920, to and including October, 1921, were approximately $300,000 short of paying actual operating expenses, taxes and interest on its funded debt.

The decisions of the District Courts of Ramsey County above referred to deny the company any relief by increased fares which had been approved by the Railroad & Warehouse Commission after hearings as provided by the law under which the company operates. The actual loss has continued to increase during this period of litigation and the company must secure financial relief in order to escape ultimate bankruptcy.

The company's 2,000 employees have loyally come to its support in accepting a wage reduction, but to furnish safe and convenient service to our car riders and pay operating expenses, fixed charges and a reasonable return to the owners of the property will require further additional net income.

The decisions of the courts severely criticise continuance of the so-called free or neutral zone and require its elimination. The company therefore has no choice in the matter but to discontinue the zone, the maintenance of which is not required by any franchise obligation.

The company, from the records on its fare boxes, read at the city limits, will have an exact account of all fares collected within the city limits of St. Paul. This method will eliminate the serious contentions now made on the part of officials of both Minneapolis and St. Paul that their respective cities are getting the worst of the accounting due to this zone.

Changed to Front-Entrance Cars.—Coincident with the change in the rule of the road to the right hand in Vancouver, Victoria and New Westminster, B. C., electric cars in Victoria and New Westminster are being operated as near-side or front-entrance cars. The former double door at the front is being used as the entrance and exit, the rear door being closed. This practice will become standard so that no change will take place when these cars are operated as one-man safety cars.

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Milwaukee Company May Try Trolley Bus

The trackless trolley may be utilized by the Milwaukee Railway & Light Company, Milwaukee, Wis., in an effort to render service in an unserved territory for which rail extensions have been asked. A statement to that effect was recently made by John I. Beggs, president of the company, in an address before the South Side Civic Association of Milwaukee. If the suggestion meets with the association's approval and if permission can be obtained from the Milwaukee Common Council, the company will undertake to furnish trolley bus service on Lincoln Avenue and on Layton Boulevard, two streets on the south side for which rail lines have been asked.

Mr. Beggs admitted the necessity for transportation service on these streets, but declared that the company was unable to build these lines with present high costs and without some assurance that sufficient traffic would develop to support the rail lines. In connection with Mr. Beggs' address there was shown to the association a motion picture film of trackless trolley buses in operation in Detroit and at the Schenectady plant of the General Electric Company.

Supreme Court Reverses Commission's Decision

The Supreme Court of Utah has just handed down a decision which reverses the decision of the Industrial Commission of Utah in which it refused to assume jurisdiction in a case involving a damage suit against the Utah-Idaho Central Railroad on the ground that the line is interstate.

The Utah-Idaho Central is an electric railroad running from Ogden, Utah, to Preston, Idaho, but the Supreme Court holds that in the instance in question the Utah commission should have assumed jurisdiction. The Utah-Idaho Central connects with the Bamberger Electric at Ogden, which latter road runs south from Ogden to Salt Lake, there connecting with the Salt Lake & Utah, which runs south from Salt Lake to Payson, Utah. Neither the Bamberger Electric nor the Salt Lake & Utah Railway crosses the state line at any point.

The case decided by the Supreme Court was brought by the Utah Rapid Transit Company, which is the name under which the Utah-Idaho Central operates the local street car service in Ogden, Utah. The Industrial Commission and E. E. Gibbons are made defendants. Gibbons, a car carpenter, was injured while repairing a Utah-Idaho Central car at the joint shops of the two companies. The car could have been used in interstate traffic, but was out of service at the time of the accident, and was later returned to service in intrastate traffic.

Gibbons was standing on a ladder repairing the roof of this car when another car belonging to the Utah Rapid Transit, and therefore only intrastate in character, ran into the ladder on which Gibbons was standing. He fell, injuring his knee. Compensation was paid in the name of the street car company for eight weeks, but ceased when Gibbons refused to waive any claim he might have against the Utah-Idaho Central. He took the case to the Industrial Commission, which refused to assume jurisdiction, on the ground that the Utah-Idaho Central is an interstate carrier, and the car he had been repairing had been used interstate.

The Supreme Court reverses this on the ground that the railroad and the car alike are at times intrastate. The case will undoubtedly come before the United States Supreme Court for final decision.

Examination Before Special Master Adjourned Until Jan. 23

After a few hours' cross-examination of Richard E. Danforth, general manager of the Public Service Railway, Newark, N. J., the fare hearing before Special Master Haight adjourned on Dec. 23 not to convene again until Jan. 23. At that time five days will be devoted to testimony on the value of Public Service property.

The subject on Dec. 23 was depreciation. Mr. Haight interrupted at one point to say that the examination reminded him of the lawyer who, after arguing for an hour, asked the judge if he followed him. The judge's answer was:

> Yes, I follow you. And if I knew any way to get back where I started from, I wouldn't follow you any further.

Two important facts did, however, get before the master on Dec. 23. One was the statement by Mr. Danforth that he believed 90 miles of Public Service Railway track should be relaid at this time. Another was that labor was 81 per cent of the company's expense, exclusive of fixed charges and rentals. The statement was made that the Public Service Railway alone employs 7,700 persons.

Subsidiary Bus Company Formed

The Evanston (Ill.) West Side Railway has been organized to connect the west side with the center of the city. The company, which has a capitalization of $10,000, is subsidiary to the Evanston Railway. Practically 98 per cent of the stock of the new organization is held by Clement W. Smith, chief owner of the Evanston surface lines. The officers are Bertram W. Rosenstone, Harry J. Myerson and Oscar Ross.

The bus service is only temporary, according to an announcement of C. F. Speed, superintendent of the Evanston Street Railway, and railway lines will be built as soon as the people and the Council wish them. Transfers will be issued between the railway and bus lines.

Reduced Fares for 1922

Slight reductions in passenger fares on the Seattle-Tacoma interurban, effective on Jan. 1, were carried in tariffs filed with the Department of Public Works at Olympia. The reductions are occasioned by the wiping out of war tax on transportation which would have brought the fares to odd cents.

Still further reductions are made by the Puget Sound Electric Railway, Tacoma, Wash., to bring the fares to even amounts. Beginning Jan. 1, the one-way fare will be $1 with $1.60 for the round trip fare. Including the war tax, the fare has been $1.10 and $1.75.

The company's petition for reduction was granted without a hearing.

No Proof that Seven-Cent Fare Is Not Needed

Judge F. M. Catlin of the Ramsey District Court in making permanent, on Dec. 28, a temporary injunction preventing the St. Paul (Minn.) City Railway from putting into effect an order of the Minnesota Railroad & Warehouse Commission granting a 7-cent fare, filed findings with memoranda as follows:

> That no general or approximate valuation of its property, used, useful or reasonably necessary for street car purposes, was or is proved.
>
> That no emergency in fact, requiring more than the authorized 6-cent rate of fare, was or is proven, and the finding of the existence of such emergency by the Railroad & Warehouse Commission is not justified by the evidence, because—
>
> There was and is no proof of any economies which may have been resorted to by the railway to avoid insufficiency of net return from operation of its railway; nor that all items actually charged by the railway company to operating expenses for the first six months of the year 1921 or estimated for the past six months of said year, were necessary to or, on account of their nature, lawfully and properly chargeable to operation or maintenance of its railway system; nor that the salaries of general officers of the appellee corporation were and are reasonable under present circumstances, and no proof whatsoever of the specific salary of any general officer.

Order Establishing Eight-Cent Fare Upheld

The United States Circuit Court of Appeals of the Eighth District on Dec. 29 confirmed the order of the Federal District Court of Colorado granting the receiver of the Denver Tramway permission to establish an 8-cent fare and enjoining the city and county of Denver from interfering with the collection of the higher fare and from attempting to enforce the 6-cent fare, which was in effect prior thereto.

Only telegraphic advices had been received at Denver on Dec. 30 regarding the decision. It was apparent, however, that the two main contentions of the railway, namely, that the franchise is not a contract, and that if a contract could be shown to exist it would be void for lack of mutuality, were upheld by the higher Court.

Boston Elevated Announces More Five-Cent Areas

The Boston (Mass.) Elevated Railway is constantly reducing fares. Wherever it finds an opportunity to serve a section without impairing its total revenue it introduces the 5-cent fare for a limited haul. It has been doing it periodically for about two years, so that there are 5-cent fare zones all over its system.

The following areas have recently been announced as 5-cent areas, to become effective on Jan. 28, 1922:

Lake Street-Commonwealth Avenue between Lake Street and Braves Field.

Newton - Brighton - Watertown between Watertown and Braves Field.

Clarendon Hill - Somerville Avenue between Clarendon Hill and Lechmere Square.

Clarendon Hill - Highland Avenue between Clarendon Hill and Lechmere Square.

Chestnut Hill - Ipswich Street between Chestnut Hill and Francis Street.

Lake Street-Washington Street, Brookline between Lake Street and Francis Street.

Jamaica Plain-South Huntington Avenue between Jamaica Plain and Francis Street.

Harvard Square - East Cambridge between Harvard Square and Lechmere Square.

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City Charges Property Overvalued

At the rehearing before the Public Service Commission on the proposed 8-cent fare for the Eugene-Springfield, Ore., system, City Attorneys Foster and Potter of Eugene and Springfield respectively charged an over-valuation of the property.

The lines are operated by the Southern Pacific Company. The railway contends that the lines are being operated at a loss.

It was pointed out by the city that the property was valued at $665,000 and that the company was only paying taxes on $140,000 of taxable properties. The city also complained of unnecessary trackage.

Danger Signals Installed for Accident Prevention

The Indiana Service Corporation, Fort Wayne, Ind., has received a shipment of the new uniform danger signals which are to be placed at all grade crossings on public highways throughout the state. As soon as the weather permits the work of installing these signs will begin.

According to an act passed early in 1921 by the state Legislature and approved by the Governor on March 10, additional uniform danger signals must be installed and maintained on all highways crossing steam or interurban railroads at a distance of 300 ft. each way from the intersection.

The signs are to be installed on the right-hand side of the road and in both directions from the crossing. This new system will give motorists ample warning that they are approaching a crossing at least 300 ft. before reaching it, and the signs are, therefore, expected to reduce accidents materially.

Superintendent of Railway May Decide Jitney Question

The determination as to whether jitney buses from the Cowen Park district will again be allowed to resume operation in competition with the Seattle (Wash.) Municipal Street Railway may be allowed to rest with Superintendent of Railways D. W. Henderson, following the action of the council in referring to him for report the entire matter. Residents of Cowen Park district have petitioned the City Council for through jitney service from the district to the downtown section, with the privilege of loading and unloading passengers at all points north of the Eastlake Bridge. Mayor Hugh M. Caldwell has written the Council, recommending that through service be allowed for the Cowen Park jitneys.

The effort to restore jitney service is made by Cowen Park residents because it is anticipated that the feeder buses now connecting with the municipal railway at Eastlake Bridge may be discontinued shortly, as they are running at a loss. Another objection to the feeder service is that the transfer privilege is not universal on the electric railway,—that is, passengers on the jitneys must pay a 10-cent fare with transfer to the Eastlake car line, but cannot transfer to any other line of the traction system. Thus, persons boarding the jitneys in Cowen Park are compelled to pay 18½ cents if they desire to ride further than the city terminus of the Eastlake line.

The Council is divided on the question of granting jitney service to the Cowen Park district, some of the Councilmen feeling that it merely means the reviving of the jitney problem throughout the city, as many other districts are without adequate street car service, and they would speedily demand jitney service similar to that furnished the Cowen Park residents.

Request to Compel Fare Advance Refused

The application of the New York, Westchester & Boston Railway, New York, N. Y., for a mandamus to compel the Transit Commission to render an immediate decision on the railway's request for permission to charge 7 cents instead of 5 within the city limits has been dismissed by Justice Burr of the Supreme Court.

Argument upon the application for the writ of mandamus was heard on Nov. 29. At that time counsel for the railway said the company had accumulated a deficit of $1,686,000 and that an increase in fare of 2 cents would cost the patrons in this city only $20,000 a year but would greatly aid the company in its efforts to make both ends meet. Counsel said that the Transit Commission had apparently pigeonholed its application. He wanted the court to stir up the commission by a mandamus.

Assistant Corporation Counsel George H. Stover, on behalf of the commission, said that it was then at work upon a report and hoped to have it ready early in January.

Justice Burr in dismissing the railroad company's application for a mandamus, said:

> A judicial body like the Transit Commission has discretion as to when and as to what it will decide, and the courts will not coerce this discretion by mandamus in the absence of facts showing that the discretion has been abused.

Justice Burr said that the failure of the commission to make a prompt decision in the present case was clearly excusable.

"Green Line Topics" Makes Debut

"Green Line Topics," first of a series of educational bulletins issued by the South Covington & Cincinnati Street Railway, made its appearance on Jan. 1. Conductors distributed copies among passengers on the cars throughout the day.

"We intend to inform you of our plans, our hopes and our troubles. There has, we believe, been too much fog, misstatement and misunderstanding, so we mean to talk to you in man-to-man fashion," reads one of the opening paragraphs in the bulletin. The bulletin informs the patrons regarding the amount of material required in the construction of the Green Line.

Wants to Run Three-Car Train

The Boston (Mass.) Elevated Railway has in contemplation taking all the surface cars out of the Boylston Street subway and introducing the three-car train, which would provide much additional seating capacity and greatly facilitate the handling of passengers at such congested points as Park Street and Scollay Square.

Transportation News Notes

Railway Starts Bus Line.—The Minneapolis Street Railway has started bus service between the terminus of its Second Street N. E. line and Camden Place. Transfers will be issued to and from the cars connecting with the bus route. The fare is 6 cents.

One-Man Cars Allowed.—The Illinois Commerce Commission recently handed down a decision authorizing the Tri-City Railway to operate one-man cars in Rock Island, Moline, East Moline and Silvis. As a result of the ruling one-man cars were being operated on the Third Avenue line between Rock Island and Moline on Dec. 26.

Wants Jitney Measure Repealed.—Lew Shank, Indianapolis Mayor-elect, has announced that he will advocate the repeal, in his administration, of an ordinance, recently passed, to regulate jitney traffic. He said he will inform officials of the Indianapolis Street Railway that he is willing to co-operate with them in efforts to establish a zone fare system for the railway.

Employees Not on Duty Must Pay.—D. W. Henderson, superintendent of the Seattle (Wash.) Municipal Railway, has issued an order that only trainmen going to and from duty may ride free on the municipal railway after Jan. 1. Hitherto, under the existing fare ordinance, all employees have been accorded this privilege. The saving to the city under this order is estimated at $100 a day.

Through Rates Cancelled.—The Interstate Public Service Company, Indianapolis, Ind., has issued a tariff cancelling its through freight rates to points on the lines of the Ohio Electric Railway. This will mean an increased cost on electric rail shipments from Louisville to Ohio territory. The action is the result of the Ohio Electric Railway's making void the through rate agreement.

One-Man Cars On Trial in Dayton.—The Dayton Street Railway, one of the five lines operating in Dayton, Ohio, will institute experimental operation of one-man cars in the near future. Provision for the operation of this type of cars was made in an ordinance just passed by the City Commission. The ordinance provides for the operation of either one-man or standard cars, and sets forth the requirements as to safety devices and operation.

Transfer Exchange Required to Be Continued.—The New York Transit Commission has denied the application of the receiver of the Coney Island & Brooklyn Railroad, and the Nassau Electric Railroad, to discontinue the exchange of free transfers with the Van Brunt Street & Erie Basin Railroad. The application was denied upon the recommendation of Howard T. Kingsbury, counsel for the commission, who conducted the hearing, and who held that the petitioners had failed to prove that any financial loss had materialized to the company by reason of issuance of transfers at certain specified points.

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Legal Notes

CONNECTICUT—*Duty to Trespassers on Tracks.*

Where trespassers on the track are to be expected, greater care to avoid injuring them is required than where they are not to be expected. In this case it was claimed that the company knew that drunken persons in all stages of intoxication were likely to be found on Saturday night upon or in dangerous proximity to the track along a certain section of the line, and that a constable was on the car especially to look out for such persons. In these circumstances, the court declared that the motorman was bound to keep a lookout for drunken men even if they were lying on the track, whereas otherwise the exercise of reasonable care might have included only their detection if walking on the track. [Carlson vs. Connecticut Company, 112 Atlantic Rep., 646.]

FEDERAL DISTRICT COURT—*Public Service Corporation Not Required to Operate at Continuing Loss.*

The public cannot require of a public service corporation the continued operation of its property under rates which would afford, not only no adequate return on the capital invested, but would entail a large continuing loss and the eventual exhaustion of the entire capital. [Charleston-Isle of Palms Traction Co. vs. Shealy et al., 266 Federal Rep., 406.]

GEORGIA—*Legislative Act and Assessment Could Not Impair Obligation of Former Ordinance Contract, Relieving Street Railway from Paying.*

Ordinance contracts, exempting a street railway from paying assessments and sanctioned by a subsequent legislative act, are valid and not illegal on the ground that they were unauthorized exceptions from payment of taxes or a surrender of the city's police power, so that a subsequent act requiring the company to pay part of the cost of paving and not referring to the former contracts, could not be so extended as to impair the obligation of the former contracts. [City Council of Augusta et al vs. Augusta-Aiken Ry. & Electric Corporation, 104 Southeastern Rep., 503.]

MASSACHUSETTS—*The Failure of a Conductor to Prevent Alighting Passengers From Crowding Is Not Negligence.*

A street car conductor was not negligent in failing to prevent passengers from crowding as they left the car, where there was no reason to expect anything unusually dangerous; the passengers not being disorderly or unruly or acting in such a manner as to call for any interference by the carrier or its agents. [Ritchie vs. Boston Elevated Ry., 131 Northeastern Rep., 67.]

MICHIGAN—*Testimony of Inability to Produce Witnesses Improper.*

In action for injuries in a collision, it was proper for the trial court to exclude from the evidence the written list of witnesses made by the conductor at the time of the accident, with testimony of inability to produce certain of the witnesses, because otherwise the impression might be created that the testimony of such witnesses, if produced, would have been favorable to the company. [Ninman vs. Detroit United Railway, 183 Northwestern Rep., 49.]

NEW JERSEY—*Passenger Injured While Walking Back to Station Held Not Entitled to Recover.*

A passenger was carried by his station but let off at another station and was given a ticket by the conductor to enable him to ride back to his station. Instead of so doing, he started to walk back on the private right-of-way of the railroad company and stumbled and fell, sustaining the injuries sued for. It was held that the railroad company was not liable for the injuries thus sustained as there was no casual connection between the injuries sustained and the act of the defendant company in not letting the passenger off at the right station. [Kelson vs. Public Service R. Co., 110 Atlantic Rep., 919.]

NEW YORK—*Doctrine of res ipsa loquitur is Applicable Only Where Instrumentality Causing Accident is Entirely Under Control of Defendant.*

Where plaintiff, an intending passenger, was injured while standing on a station platform by being struck by a bundle of newspapers thrown from a passing train by one who was not an employee of the railroad company, there was no assumption that defendant's negligence caused the accident; the doctrine of res ipsa loquitur applying only where the instrumentality through which the accident happens is entirely under the control of the defendant. [King. vs. Interborough Rapid Transit Company, 188 New York Sup., 700.]

PENNSYLVANIA—*Person Merely Deprived of a Method of Travel May Not Appeal from Grant of Permission to Railroad to Surrender Charter Rights.*

The only question to be determined by the trial court on petition of a railroad for permission to surrender its charter rights to operate a road over part of its line, is whether it may be granted without prejudice to the public welfare or to the creditors and in the interests of the corporators. Hence, a decree granting such permission may not be appealed from by a private individual merely because he will, by discontinuance of operation, be deprived of one of the ways previously used by him in traveling to and from his home, his grievance not being different in kind from that of the general public, but only in degree, so that he is not a person aggrieved. [Petition of Eastern Transit Company, 112 Atlantic Rep., 917.]

TENNESSEE—*Contributory Negligence of Beneficiary Bars Recovery.*

A mother, while driving an automobile in which her son and daughter were seated, collided with a car. The mother and daughter were injured and the son was killed. There was negligence on the part of both mother and motorman. Damages were refused to the mother on account of her negligence, but were awarded to the daughter and there was a judgment for $8,000 for the death of the son, the mother and daughter being beneficiaries. The court held, however, that as the mother was negligent, her share could not be collected, but the daughter could collect $4,000. [Anderson vs. Memphis Street Railway, 227 Southwestern Rep., 39.]

SOUTH CAROLINA—*Directions of Traffic Officer Not Controlling.*

There is no absolute duty on a motorman to obey the traffic officer's signal to cross a street without regard to existing circumstances, conditions or consequences, but he is required to stop, notwithstanding a signal to proceed, if in the exercise of reasonable diligence it is necessary so to do to prevent a collision. [North State Lumber Company vs. Charleston Consolidated Railway & Lighting Company, 105 Southeastern Rep., 406.]

TENNESSEE—*Contracts Not to Join Labor Union Not Contrary to "Public Policy."*

Individual contracts between a street railway company and its employees, whereby they agreed not to join any labor union during the term of their service, provided these contracts are not contrary to any provision of the state or federal Constitution or statutes or any rule of the common law, are not opposed to "public policy." The report of the National War Labor Board providing that the right of workers to organize trade unions and to bargain collectively "shall" not be denied, etc., and that employers should not discharge workers for membership in trade unions, does not invalidate agreements by employees not to join a union, or render them contrary to public policy, as "shall" is used in the sense of "should." [Nashville Railway & Light Company vs. Lawson, 229 Southwestern Rep., 741.]

WISCONSIN—*Boy Held Trespasser in Climbing Tower Carrying Electric Wire.*

Where boys often played in a field containing steel towers bearing electric wires to the knowledge of the owner, but had never climbed the towers beyond the first crossbars and the owner's employees had never seen them on the towers, a boy climbing one of the towers to a height of 30 ft. and there coming in contact with a high-tension wire was a trespasser, and the owner owed him no active duty to protect him, whether or not he was a licensee, while playing at the foot of the tower. [Bonniwell vs. Milwaukee Light, Heat & Traction Company, 182 Northwestern Rep., 468.]

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Personal Mention

Assistant Manager Appointed in Detroit to Further Municipal Service

When the development of the municipal street railway system of Detroit, Mich., reached the stage where Mayor Couzens felt he could no longer keep in as close touch with it unaided as he desired, he sought someone who could relieve him of some of the responsibility to the people in carrying out the program of municipal operation. With this idea in view he recently appointed Ross Schram assistant general manager of the Detroit Municipal Railway.

On Mr. Schram will rest the responsibility of assisting the operating force of the municipal system to carry out the will of the people and of selling service in accordance with the Mayor's interpretation of the people's stand for municipal ownership. He will be the main point of contact between the administration and the operating organization.

Mr. Schram was born in Battle Creek, Mich., in September, 1888, and his first connection with Detroit affairs came when he was municipal representative for the Detroit *News*. This was after his graduation from the Detroit University School. Later he entered the automobile field and was connected with the Charles H. Fuller Company, advertising agents, Chicago, handling the Overland, and with the J. Walter Thompson Company, New York, Ford agents. He was also associated with the Packard Motor Car Company as editor of the Packard house organ. For two years he was an automobile dealer in Ottawa, Ont.

As secretary to Mayor Couzens from 1919 to 1921, he became familiar with the policies of the Mayor as regards municipal ownership. For the past two and one-half years he has also been secretary to the Street Railway Commission, including the time while the fight was on for the municipal ownership ordinance which was approved by the voters of Detroit.

The position which Mr. Schram fills is a new one created to meet the demands resulting from the rapid expansion of the municipal system. He does not claim any technical experience in the operation of an electric railway. His efforts will be directed mainly toward the furthering of the policy of the Mayor and the Street Railway Commission to sell the idea of service to every one connected with the electric railway organization.

G. S. Wills Is Now Managing Wheeling Traction Company

Announcement has been made by the officials of the Wheeling (W. Va.) Traction Company of the appointment of G. S. Wills as general manager. Mr. Wills has been connected with the Wheeling Traction Company as assistant to the vice-president for the past year and a half and succeeds C. P. Billings as general manager of the Wheeling Traction Company.

The recent acquisition by the West Penn Power Company of new light and power interests in West Virginia and the growth and development of the properties in Pennsylvania have resulted in the placing of new and added responsibilities upon Mr. Billings, which require that a part of his time be spent away from Wheeling. Mr. Billings will, however, continue to make his headquarters in Wheeling, and will also continue the general supervision of the Wheeling Traction Company as its vice-president.

Mr. Wills has been connected for many years with the West Penn Power Company in Pittsburgh.

Fielder Sanders Retires

Has Been Cleveland's Railway Commissioner During the Difficult Period Since 1916

Fielder Sanders, who has served as street railway commissioner of Cleveland, Ohio, for the past six years, retired from that position on Dec. 31. He has resumed the private practice of law and will specialize in public utility cases and franchise matters. It is understood that Mayor Fred Kohler's choice for the office is James W. Holcomb.

FIELDER SANDERS

Mr. Sanders' legal experience has been extensive. For some time he was chief assistant county prosecutor and in this position had charge of all civil matters. He thereafter became judge of a municipal court in Cleveland, and was serving in this post previous to becoming commissioner.

Mr. Sanders took an active part in matters pertaining to street traffic and railways during all his years of service. He assisted in drafting a national code of traffic principles and was the founder of an organization of electric railway commissioners in cities having service-at-cost franchises. Entering office in 1915, Mr. Sanders was the third commissioner in Cleveland since the Tayler service-at-cost franchise went into effect in 1910. His term of office extended during the difficult war period when rising costs of operation made necessary an increase in the rate of fare amounting to 100 per cent. The confidence of the public in Mr. Sanders and the management of the Cleveland Railway is attested by the fact that this 100 per cent increase in rate of fare was accepted by residents of the city with but little adverse comment.

During Mr. Sanders' term of office also the service-at-cost franchise was extended and renewed and the maximum rate of fare raised to 6 cents cash with a penny charge for transfer. In a recent statement he said that during the last six years the correctness of the principles of the Tayler grant had been proved, for it had adjusted itself to the trying circumstances of war conditions and carried the company through particularly bad conditions. One point which he considers in its favor is that it has kept the railway out of politics.

Just before leaving his office, Mr. Sanders, in a report to the City Council, made several formal recommendations, among them the suggestion that the Cleveland Railway use buses and that the company attempt to collect back income taxes which it has paid. Mr. Sanders was interested in the development of a rapid transit system for Cleveland and served on a commission to establish such service. The plan submitted to the city failed to win the approval of voters. Through extensive changes in routing, replacement of rolling stock and extensions of lines, the Cleveland service was bettered even during adverse times.

Mr. Sanders reported to the City Council the accomplishments of his office during the past six years, a digest of which was printed in the ELECTRIC RAILWAY JOURNAL for Dec. 31, 1921.

Walter W. Austin is the newly elected president of the Kansas Public Service Association. He has served for five years as secretary-treasurer of the association and was elected its president at the recent meeting at Hutchinson. Mr. Austin is the owner and operator of the Home Light & Power Company, operating at Cottonwood Falls and Strong City, Kan.

Dexter S. Kimball, dean of the College of Engineering, Cornell University, has been elected president of the American Society of Mechanical Engineers for the year 1922. Since 1911 Dean Kimball has been a member of the Council on Industrial Engineering, New York State Department of Education. He is also a member of the Society for the Promotion of Engineering Education and the Society of Industrial Engineers. He is vice-president of the Federated American Engineering Societies.

Joseph Johnson, who was chief of the transportation bureau of the Public Service Commission for the First District of New York from 1914 to 1917, was recently appointed commissioner of public works for Manhattan under Julius Miller, the new Borough President. Mr. Johnson has held many administrative positions in New York City. For the two years previous to his connection with the Public Service Commission he served as fire commission under Mayor Gaynor. He received this appointment after holding the office of deputy fire commissioner of New York from 1910 to 1912. Mr. Johnson began his career as a newspaper man. He was city editor of the Atlanta *Journal* in 1896 and served on the staff of the New York *American* from 1897 to 1901, and during the Spanish-American War Mr. Johnson was a war correspondent for that paper.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

1921 a Year of Price Reductions

Lowered Costs of Nearly All Materials for Electric Railways Have Failed to Stimulate Buying — Greatest Activity in Rail Purchases for Track Reconstruction—Motor Production at New Low Point

Hectic indeed have been the 365 days of 1921 for the electric railway purchasing agent and as lean have been the orders for equipment and material placed with manufacturers and jobbers. Hampered at every turn by lack of funds, their buying has been mostly of material for maintenance and rehabilitation work. This is borne out by the figure for the number of miles of track reconstructed, which was the largest since the data have been collected. New track laid is even less than that built last year, which, when considered with the amount reconstructed, shows the marked tendency of the electric railways to spend their available money for maintenance and not for expansion even when there is a decided necessity for such. New rolling stock purchased is the lowest in the history of the industry, but a large number of cars have been reconstructed. No definite figures can be given for rehabilitated rolling stock since there is no line of demarkation between maintenance and reconstruction. However, the marked tendency to keep old equipment in running condition rather than scrap it has been plainly in evidence during the past year.

The prospects for 1922 are the brightest and most hopeful that the industry has seen in five years. The only good thing about 1921 is that it has passed. Its showing would have been much more discouraging had it been called upon to assume its proper proportion of maintenance and renewal costs. This being true, it follows that 1922 and subsequent years will be called upon to bear burdens which should have been spread over the past five years. These burdens, too, will be much greater than if the work had been done at the proper time. In spite of this deferred maintenance the electric railways have been witnessing through 1921 an ever-increasing gap between operating expenses and income. They have also seen prices gradually come within reason, accompanied by deliveries on a normal pre-war basis.

This year likewise has a most promising and encouraging outlook for the manufacturer of rolling stock and supplies. Readjustment in labor and materials has made it possible to reduce quotations in nearly every line. Though wage scales are still at too high a level to allow a recession to pre-war prices, a consistent tendency toward reduction is noticeable. The fundamental commodities of steel and copper have both undergone severe drops in prices. Steel is now approximately 50 per cent higher than it was in 1913, while copper has passed its low point and there has been an advance in prices during the past few months as the result of a greater demand for the metal, coupled with a curtailment of production.

According to Albert F. Richey's "Prospectus of Indexes" electric railway materials have shown a drop of 89 points since September, 1920, when the index was 237, as compared with 100 in 1913, which was taken as the base year. Thus materials are but 58 per cent higher than they were in the pre-war year of 1913. Manufacturers, as well as every master mechanic and maintenance of way superintendent, know that there exists a market that has been starved but which is soon to be revived. Undoubtedly they are also aware that the electric railways will put every available dollar into track and rolling stock material in the near future. Judging by the conditions of most properties, their belief certainly has considerable substantiation.

Electric railways have been quite active in the rail market during the past year. The most notable occurrence in this market by which they have benefited was the reduction of the price from $47 to $40 a ton. This figure is about $12 higher than the average figure for 1902 to 1915 and $17 lower than the peak reached in 1918. Steel rails were the last of the important steel products to succumb to the adjustment which the steel industry has experienced since the fall of last year. All the important products, including plates, beams, bars, billets and pig iron, have been sharply reduced from the prices which prevailed previous to the falling off in the demand for steel, but even in the face of the reduction in all of these products steel rails held their own until the latter part of October.

The standard T-rail business of mills at the present time is in much better shape than other classes of steel business. Around the first of the year sizable orders were placed, the buying coming early and largely at one time. The same is true of girder rail orders. A fair tonnage was ordered early. Though the tendency of electric traction companies has been to hold off buying until a tremendous potential need for girder rails has been created, no sensational buying resulted. Although the new track constructed during 1921 was about 30 miles less than that built in 1920, this difference is more than wiped out when it is considered that 615 miles of track were reconstructed last year, as compared with 361 during the previous year.

That there has been some activity in the field of track construction work is evidenced by several sizable orders for rails. The city of Detroit, Mich., Department of Street Railways placed an $800,000 order for rails and special trackwork early in the year. The United Railways of St. Louis reconstructed 32 miles of track which required the purchase of 5,000 tons of rail, and in all nearly $1,500,000 was spent in track rehabilitation there. The Chicago Surface Lines placed an order in July for 4,000 tons of girder rail, while the Toronto Transportation Commission bought a like amount, together with 500 tons of T-rail.

This trackwork of course necessitated considerable buying of railroad spikes, bolts and nuts. Producers during the early part of the year had accumulated a reasonable reserve supply, sufficient to make deliveries of all standard mate-

New York Metal Market Prices

	Jan. 4, 1922
Copper, electrolytic, cents per lb.	13.50
Copper wire base, cents per lb.	15.12½
Lead, cents per lb.	4.70
Nickel, cents per lb.	35.00
Zinc, cents per lb.	4.85
Tin, Straits, cents per lb.	32.37½
Aluminum, 98 to 99 per cent, cents per lb.	19.00

Bituminous Coal Prices

	Jan. 2, 1922
Smokeless mine run f.o.b. vessel, Hampton Roads	$4.68
Somerset mine run, Boston	1.80
Pittsburgh mine run, Pittsburgh	2.15
Franklin, Ill., screenings, Chicago	2.10
Central, Ill., screenings, Chicago	1.93
Kansas screenings, Kansas City	2.50

Old Metal Prices—New York

	Jan. 4, 1922
Heavy copper, cents per lb.	11.25
Light copper, cents per lb.	9.12½
Heavy brass, cents per lb.	5.37
Zinc, old scrap, cents per lb.	2.67
Yellow brass, cents per lb.	5.25
Lead, heavy, cents per lb.	3.67
Steel car axles, Chicago, net ton	$15.75
Old car wheels, Chicago, gross ton	15.50
Rails (short), Chicago, gross ton	13.25
Rails (rerolling), Chicago, gross ton	12.75
Machine turnings, Chicago, net ton	3.75

Electric Railway Material Prices

	Jan. 4, 1922
Rubber-covered wire, New York, cents per lb	6.72
Weatherproof wire base, N. Y., cents per lb.	16.25
Standard Bessemer steel rails, per gross ton	40.00
Standard open hearth rails, per gross ton	40.00
Wire nails, Pittsburgh, cents per lb.	2.50
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.25
Tie plates (flat type), cents per lb.	2.00
Angle bars, cents per lb.	2.40
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.12½
Steel bars, Pittsburgh, cents per lb.	1.50
Sheet iron, (24 gage), Pittsburgh, cents per lb.	2.85
Sheet iron, galvanized, (24 gage), Pittsburgh, cents per lb.	3.55
Galvanized barbed wire, Pittsburgh, cents per lb.	3.15
Galvanized wire, ordinary, Pittsburgh, cents per lb.	2.75
Car window glass (single strength), first three brackets, A quality, N.Y., discount*	81%
Car window glass (single strength), first three brackets, B quality, N. Y., discount	81%
Car window glass (double strength, all sizes, A quality), New York, discount	83%
Putty, 5 lb. tins, cents per lb.	4.75
Waste, wool, cents per lb.	13.00
Waste, cotton, (100 lb. bale), cents per lb. White	10.00
Colored	9.00
Asphalt, per ton, f.o.b. Bayonne, N. J.	$16.00
Paving stone, 4x8x4, f.o.b. Chicago, dressed, per sq.yd.	$3.35
Common, per sq.yd.	$3.00
Wood block paving 3½, 16 treatment, N. Y., per sq.yd.	2.17
Crushed stone, ¾ in. carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers net prices, without bags	1.97
Linseed oil, (5 bbl. lots), N. Y., cents per gal.	72.00
White lead, (100 lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N. Y., cents per gal.	82.50

*These prices are f.o.b. works, boxing charges extra.

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rial from stock, but there was a growing tendency to curtail production. The reduction from peak prices of spikes and bolts to date has been considerable, ranging from about 20 to 40 per cent with different companies. The current base price of track bolts and nuts is about 3 cents per pound, while standard railroad spikes are from 3.8 to 4 cents per pound.

The prices of track tools also came in for revision. The reduction from peak prices by different producers ranged from 10 to 30 per cent. Although stocks were held to a low level immediate deliveries were made.

Special trackwork in the electric railway field showed quite an improvement during the year. Isolated and concentrated activity in a few sections of the country rather than a general improvement accounted for the increase in this buying. It was said that the street railways were more active than the steam railroads in this market. Orders, of course, represented pressing repair needs for the most part, rather than new track extensions.

Line Material Prices Undergo Several Reductions

The prices of overhead copper line material during 1921 have been marked with numerous reductions. There have been at least five increases in the discount, so that prices are roughly 25 per cent less than they were a year ago. Buying during the year was for maintenance only, with railways never endeavoring to stock ahead. Stocks of standard finished products and semi-finished material in this field are in good shape with prompt deliveries prevailing.

Car Wheel Production Low

A survey of the market among producers of chilled iron and rolled steel car wheels made in June revealed virtually a uniform condition of light demand. Both steam and electric lines were buying the smallest number of wheels possible to meet their requirements, orders were scattered and there were no large ones placed. Some manufacturers reported a production as high as 40 to 60 per cent of capacity, but the general operating scale was lower than it had been for many years. Nearly all wheel companies have reduced wages, though here and there one reported undiminished labor cost. The average decrease in wages has been from about 10 to 20 per cent, with an extreme of 25 per cent. Most producers are now selling wheels at a quotation approximately 25 per cent lower than a year ago.

Brake Shoe Prices Down

The price trend of brake shoes has been downward. Reductions have been made in several instalments so that they can now be purchased at about $16 less per ton than at this time last year. This is a substantial reduction when it is remembered that the brake shoes were advanced in price since before the war less than almost any other item of railway equipment. Buying, for the most part, was for immediate needs only, though in the electric railway field buying has been proportionately greater than in the steam railroad field, some traction companies carrying from two to three months supply. The market has presented much the same feature as other railway equipment lines. Stocks of finished material were maintained rather large and deliveries, of course, were immediate. Orders to equip new rolling stock were a negligible factor.

Railway Motor Production at Low Point

The sale of railway motors was not as gratifying last year as it was during 1920, especially during the first half of 1920. The bulk of the demand, of course, has been for motors of the safety-car type. The sale of motors began to show considerable falling off in the spring of last year. Even though the buying of this class of material has been subnormal for several years past, the present market appears to be especially below par. It was estimated recently that the demand during the year ran about 50 per cent below normal and about 25 per cent below the record for 1920. The fact that less than one-third the number of safety cars were ordered during 1921 than during 1920 helped account for this fact. On another page it will also be noticed that the total rolling stock ordered last year was approximately half of that purchased during the year previous. This decided slump in the demand for both safety and urban cars is reflected very forcibly in railway motor production.

Prices have come down from the peak, of course, the reduction in one instance amounting to from 10 to 20 per cent. Unless there are further decreases in labor and material costs no further price reductions are foreseen, especially while the necessarily curtailed production entails a high overhead. It can undoubtedly be said that motor manufacturers will be among the first to benefit when the electric railways begin to purchase badly needed rolling stock.

1921 a Year of Price Drops

The year 1921 has been one in which reduction has taken place in nearly every type of material and piece of equipment used by electric railways. It has been a case where price lowering has not been accompanied by increased buying. It would be useless to enumerate the various items in which reduction has taken place. In some cases the reductions are but 5 or 10 per cent, while in others they are as high as 40 or 50 per cent. A weighted average for all materials would probably indicate that the electric railway purchasing agent is buying the same amount of material now for 30 per cent less than he paid a year ago.

Rolling Stock

Philadelphia & Western Railway, Norristown, Pa., has ordered two 56-ft. center-entrance motor cars from the J. G. Brill Company, Philadelphia, Pa.

Johnstown & Somerset Traction Company, Johnstown, Pa., has placed an order for two double-truck motor cars with the J. G. Brill Company, Philadelphia. These cars will be built at the Kuhlman plant of the company.

Track and Roadway

Muskegon Traction & Light Company, Muskegon, Mich., has been improving the tracks and welding the rails.

Jackson Public Service Company, Jackson, Miss., is tearing up its tracks at the head of Capitol Street and is laying a new switch to replace the worn-out one.

Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md., is constructing a 2-mile siding at Jones' station and will soon complete the block system on its lines. Ties have been replaced under much of the track, wires realigned and a uniform voltage of 1,200 has been adapted. Twenty-five additional telephones have been installed along the way. The equipment hereafter is to be regularly inspected.

Buffalo, Arcade & Wellsville Electric Traction Corporation, Buffalo, N. Y., is about to contract for all material necessary for the construction of an 81-mile high-speed passenger and freight line. A 650-volt direct-current system will be installed with converters taking their power from a three-phase, 25-cycle transmission line. The track will be laid with 65-lb. rail. Construction work will be commenced about March 1, 1922.

Dallas (Tex.) Railway and the Supervisor of Public Utilities are working out plans for electric railway extensions in Dallas, in keeping with the expansion and growth of the city. Extension of car tracks on Parry and Lindsley Avenues to Auburn and the utilization of the tracks of the Terrell Interurban, now building on Forney Avenue, for another approach to the Mount Auburn section of the city are the next developments under the plans now being worked out. It is expected that these two lines will be built and put in operation on the completion of the Terrell Interurban, which is expected to be finished about Nov. 1, 1922.

Power Houses, Shops and Buildings

Commonwealth Edison Company, Chicago, Ill., will build a power plant on the Indiana side of the state line north of Hammond. Power for the entire urban system of street railroads could be provided by this plant.

Vincennes (Ind.) Street Railway is installing two motor-generator sets to convert the power purchased from the Indiana Power Company to direct current. Heretofore, direct current has been supplied to the railway by the company. The machines are being installed in the carhouse on North Eighth Street.

British Columbia Electric Railway, Vancouver, B. C., is lengthening the station platforms on the Central Park line to a 75-ft. standard to accommodate three-car trains for some time in the future. The alterations are taking place at present owing to a number of stations being removed to new locations to conform to the new rule of the road which has just gone into effect. Stations are located on the near side of level crossings.

Trade Notes

Texas Company, New York, has consolidated its traffic and railway sales department into one department known as the railway and traffic sales department. The headquarters of G. L. Noble, vice-president; William Jervis, manager; W. E. Greenwood, assistant manager, is at 17 Battery Place, New York, which will also be the headquarters of J. E. Symons, superintendent of the lubricating division of the department.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has begun work on the largest single order for electrical transformers ever placed, according to announcement made by officials of that company. The order was received by the Westinghouse Electric International Company, through its Japanese agents, Takata & Company, from the Daido Electric Power Company of Japan. The contract calls for thirty-four transformers, averaging 9,400 kva. each, a total of 316,400 kva. The transformers will be single phase, 60 cycle, oil insulated and water cooled, and will have a high voltage of 154,000 volts, which is the highest voltage in commercial use at this time. When installed, they will weigh 50 tons each. The Daido Electric Power Company of Japan will install these transformers in a super-power system in the industrial district about Tokio. This super-power zone is similar to that now under consideration for the area between Boston and Washington. Eleven months will be needed to complete the order, which calls for an expenditure of approximately $2,000,000 for the entire equipment.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Volume 59 — New York, Saturday, January 14, 1922 — *Number* 2

Thrift Week Begins Tuesday, Jan. 17

THE name of Benjamin Franklin is associated with the idea of thrift in this country, and it would be well if our people as a whole understood and followed the advice of this philosopher and statesman in this respect more than they do. His name is a worthy one to associate with this movement because while being thrifty and preaching thrift he never carried the virtue to excess, where it becomes niggardly. Franklin's idea was that thrift meant the expenditure of money wisely and without waste.

Franklin's birthday anniversary, Tuesday, Jan. 17, will be celebrated again this year by a country-wide effort to promote thrift. A campaign will be inaugurated on that day to promulgate this tenfold creed: Work and earn; record all expenditures; make a budget; have a bank account; carry life insurance; own your home; make your will; pay your bills promptly; invest in safe securities; share with others. These are the principles followed by all really thrifty people. They will serve as a standard for all self-respecting electric railway men who wish to safeguard the future and maintain a reputation as substantial members of the community.

Thrift associations have been formed on a number of electric railway properties, but there should be more of them. The railway company has the organization by which it can assist employees to save and invest. More of this work should be done.

Have Fares Come Down as Much as They Should?

THIS is a question which is being asked in a number of cities.

The armistice was declared in November, 1918, or more than three years ago. Considerable reductions have since been made in the price of commodities and in the cost of living. According to the Bureau of Labor Statistics of the United States Department of Labor, the index number for the retail prices of the principal articles of food, weighted according to the average family consumption in 1901, had come down to 153 in October, 1921, as compared with a maximum of 219 in June and July, 1920. People generally, whether employers or employees, do not have as much coming in as formerly, yet the average fare for city lines in December, 1921, according to Professor Richey, is within 1 per cent of the maximum of 7.24 cents in May, 1921.

One reason that fares will be, and ought to be, slow in coming down is that they were slow in going up, and in this connection it is noticeable that in the figures from which the quotation just given was made the "peak" was not reached until May, 1921. In December, 1920, the average city fare was only 7.14 cents.

Another reason that fares will be slow in coming down is that they have not far to fall, compared with other prices. If 1913 is used as a basis, it will be found that railway materials rose 147 per cent, wages 132 per cent, wholesale commodities from 118 to 172 per cent, and cost of living 104 per cent, yet street railway fares increased only 49 per cent from 1913, and in that year were generally recognized as inadequate to give a fair return to the railway company. Again, as has been pointed out previously in these columns, even if the average fare should be proved to be too high, which it is not, a period should be permitted during which the company can build up its property as well as its credit so that it may be in a position in the future for normal and healthy growth as conditions demand its expansion.

After the present period of industrial depression has passed, a period will come when there will be a great demand for transit facilities. Obviously it is a wise policy now for every city to encourage rehabilitation of these companies, both financial and physical, so that they shall be prepared to carry out their future duties as common carriers.

Educational Committee Activity of American Association Is Rejuvenated

AFTER a lapse of several years the American Association has again appointed a committee on education. Such a committee is now provided for in the constitution. The new committee has sent out a preliminary outline of its program, which is comprehensive and well considered. The committee asks for the co-operation of the membership. This should be freely and cheerfully accorded, because one of the fundamental needs of the industry collectively and in its individual units is education. If the committee can this year contribute toward meeting this need, it may properly commandeer whatever it needs in the way of assistance from the electric railways of the country.

For several years the American Association had an active committee on education. Its work was well received and commanded the respect of managers, but the results were found not to be commensurate with the effort necessary to get anything over. The industry apparently was not ripe for concerted effort in employee training. The suggestions made by the committee received tacit assent; the committee's experiments were supported financially and aroused some interest, but in general nothing vital resulted. Possibly this was because ten years back the industry was enjoying a degree of prosperity, and thus electric railway managers did not feel the need for employee training. Possibly, also, the need is felt now acutely enough to warrant a new investment in time and energy on the part of a committee on education. The membership has an opportunity, by prompt response to the committee's request, to show that the need is appreciated.

The earlier committee did a number of practical things that may properly be recalled at this time. For example, it prepared and promulgated a scheme for a cadet system to prepare young men, particularly

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college graduates, for positions of responsibility. This was given a demonstration on a considerable scale by the Public Service Railway, with good results. Other railways also presumably did the same on a smaller scale. Then the committee conducted a correspondence course for picked groups of employees which was financed by a small group of railways. The results of this tentative course were good. It was not the idea of the earlier committee that the association itself should become a training school, but it was hoped that the experience gained in these demonstrations would be of direct use to the members. Undoubtedly it was of some use, but it is only fair to the committee to say that the net result was disappointing.

The new committee, under the chairmanship of Edward Dana of the Boston Elevated Railway, is well selected for the purpose which has been outlined in the letter sent to member companies. The program covers all phases of training of present employees and of securing desirable recruits. Let's give the committee a good boost.

Insurance a Gyroscope in the Railway Industry

INSURANCE is an asset whose value is realized when disaster occurs, and the old saying that "hindsight is always better than foresight" applies to insurance with peculiar aptitude. It is a financial gyroscope for the railway industry which functions to stabilize the invested capital and the existing labor relations during tempests, fires, strikes, earthquakes or other "acts of God."

Time and theories and insurance policies are ever changing, and the latest development in insurance has been the rapid growth of a type of insurance designed to fix and nurture pleasant relations between employer and employee and financially and temperamentally to improve the moral and mental status of the employee. Such social insurance is the keystone in many railway social structures and acts as a nucleus around which to build up mass morale and *esprit de corps.*

To many railway executives, especially in these hard times, the most evident feature of insurance is its cost —it is classed with taxes—and they are tempted to decrease the amount of the existing insurance and are not in the least anxious to look into or take out policies embodying the new ideas in insurance.

All human beings are inclined to be both optimistic and fatalistic and dislike to borrow trouble or think of such disagreeable things as a financial loss, a strike or other business catastrophe. Like gamblers, people believe in "luck" and like to take a chance—all in keeping with the improvident reputation of Americans.

Railway executives are human and Americans and some of them have the national traits. Then again some of them look upon an insurance agent as a leech bent only upon sucking their blood and do not appreciate the curative properties of a good blood-letting. Others surrender to all types of insurance in order to avoid a wordy argument or in order to play safe and then think they have accomplished the full result from insurance by locking a few policies in a fireproof safe. Still others think all insurance is alike and choose the company with which to do business because the agent who represents it in their city is a personal friend.

Fire insurance is a necessity for railway properties and is subject to many economies, yet no concerted attempt has been made by the railway executives to consider the subject on a national basis or to formulate ideas as to proper contractual conditions. Each property provides for its insurance in a manner that results from a study by the local organization and may carry its own insurance, join a mutual association or take out a policy with an old line company without comparative study of the methods and sometimes even without a detailed study of the policy clauses. Of course it is a complicated and technical business, and it is difficult to see how co-operation can help the railways, but, in principle, such co-operation is needed to secure economies.

Social insurance is pretty well standardized as to policy clauses and premiums, but each railway embarks on an uncharted sea in attempts to inaugurate the policies and adapt them to its specific organization. Such insurance is a splendid agent to cement an organization and to enable the employee to maintain his self-respect, because he can look at the future with confidence. Its possibilities are unlimited and its greater development is warranted. The critical element of human relations, however, enters into its operation and renders it an operating asset or liability, depending on how it is managed and maintained.

Liability, strike, catastrophe, motor bus and other special forms of insurance are new and rather expensive. On paper the ideas are good, but time alone will determine the economic status of some of the special types.

On the whole, insurance is a competent, well-organized business and railway companies can expect few economies through reducing insurance rates unless the risk is reduced at the same time. As a specific proposition, however, many railway properties can use more insurance, better types of insurance, and can make reductions in the cost of existing insurance if they have available a better knowledge of the insurance business and secure better co-operation from their executives in a co-ordinated study of the possibilities of insurance as an operating asset.

Richmond Company Forced to Retrench

THE railway at Richmond, Va., has announced a drastic wage reduction effective Jan. 16. Naturally the reduction falls heaviest on the new men. Under the revised scale they will be paid 30 cents an hour instead of 43 cents. The general decline in industrial activity and the growing popularity of the private automobile have been contributing factors to the ills of the company, but the principal cause of the company's troubles has been the unregulated jitney competition in Richmond on routes served by street cars. The extent to which the company has suffered is best shown by the statement that for the year ended July 1, 1921, the railway system failed to earn operating expenses and fixed charges by $553,887. Since then the situation has grown steadily worse.

The answer to the company's troubles is not hard to find. It needs a new deal all around. It needs a new franchise. It needs relief through jitney regulation prohibiting operation along the routes served by street cars. It needs relief from paving and other burdens. If it does not secure them the outlook is for still greater retrenchment by the company all along the line. This is the only course left open now. Whether the company is forced again to resort to the expedient of retrenchment depends upon the degree of intelligence and the promptness with which the Council answers the company's plea.

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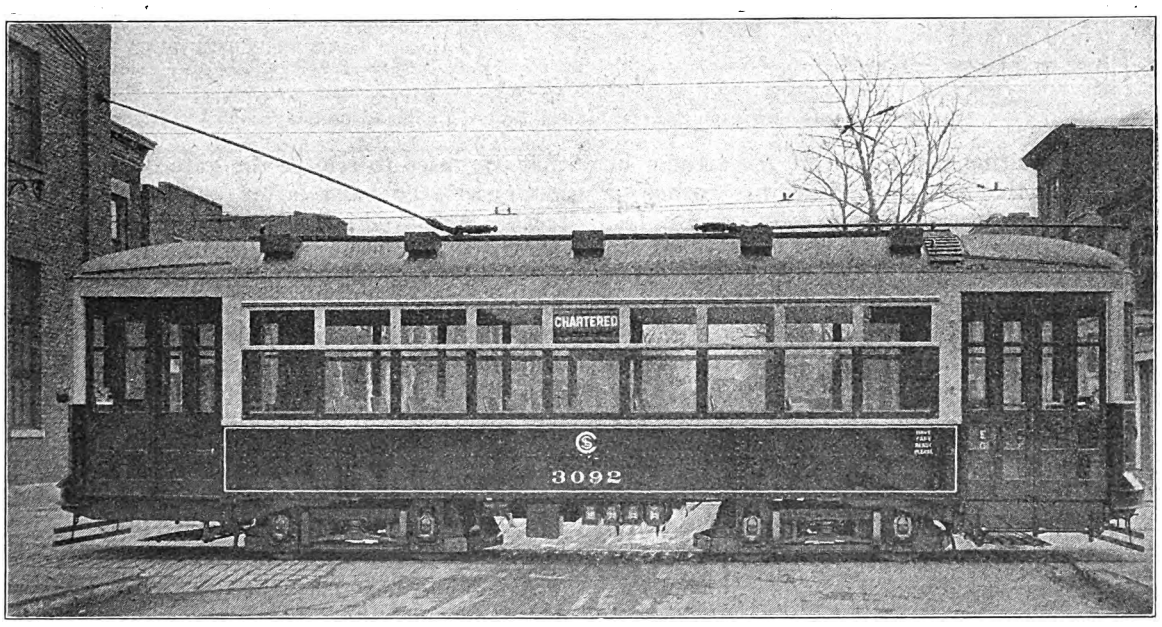
Two New Types of Safety Cars for Chicago

A Single-Truck and a Double-Truck One-Man Safety Car, Both Arranged for Double-End Operation, with Separate Entrance and Exit Passageways and a Unique Gate Barrier in the Exit, Have Been Built for Trial by the Chicago Surface Lines

BY CHARLES GORDON
Engineer of Equipment Chicago Surface Lines



CHICAGO'S NEW DOUBLE-TRUCK SAFETY CAR

THE Chicago Surface Lines has recently placed in operation two sample double-end, one-man safety cars embodying some developments from existing types both as to design and details of construction. One of these cars is of the single-truck type equipped with two 25-hp. motors and the other is equipped with double trucks and four 25-hp. motors. The single truck car is 29 ft. 4½ in. long over the bumpers, 8 ft. wide over the side girders and weighs 16,375 lb. complete. The double-truck car is 37 ft. 2 in. long over the bumpers, 8 ft. 6 in. wide over the drip rails and weighs 28,050 lb. complete. These cars were designed and built at the West Shops of the company, under the direction of H. H. Adams, superintendent of shops and equipment.

This company began the operation of one-man safety cars on its system in February, 1921, with ten standard Birney single-truck cars purchased from the J. G. Brill Company. They are 28 ft. ½ in. long over all, 7 ft. 8 in. wide, weigh 16,600 lb. complete and are arranged for double-end operation with the usual single doorway at each end for both entrance and exit of passengers. Experience with these cars on some of the outlying lines in Chicago proved them to embody certain limitations, even for such service. Most important of these limitations are the following: (1) Excessive time for passenger interchange due to single doorway; (2) congestion within the car due to narrow aisle and restricted space for movement of passengers at the front end, and (3) excessive damage to the car from comparatively light collisions.

A careful study was made of these various factors to determine whether they could be overcome. It became apparent that their elimination would produce a car much better adapted for operation in Chicago. It was thereupon decided to build a sample car embodying the changes desired. The plans provided for maintaining, or even reducing if possible, the weight as represented by the ten safety cars then in service. This was accomplished, despite the fact that the construction of the end framing was stiffened by using heavier members, that a separate entrance and exit was provided and the aisle made wider. The seating arrangement was also changed to avoid congestion at the front cross seats and an attempt was made to improve the general lines and appearance of the car.

The desires for a separate entrance and exit, combined with one-man operation, presented some difficulties. It was apparent that the chief objection to a double opening was the extra supervision required of the motorman. The use of any selector arrangement for the independent operation of the entrance and exit doors would have imposed additional duties on the motorman, whereas the simultaneous opening of both doors at points where a large number of passengers board the car would result in two streams of entering passengers, making a difficult fare collection problem.

As the first step in the solution of this problem, it was decided to open the doors simultaneously, but to incorporate in the exit passage an automatic locking barrier or gate, which would allow the free exit of alighting passengers, but effectively prevent boarding passengers from entering on the exit side. This device, as worked out, is entirely automatic in its operation and allows the motorman to give his entire attention to the collection of fares. It provides the desirable double passageway and avoids confusion during a heavy interchange. The operating mechanism consists of a large treadle plate in the car floor, so placed that it is naturally stepped upon by passengers approaching

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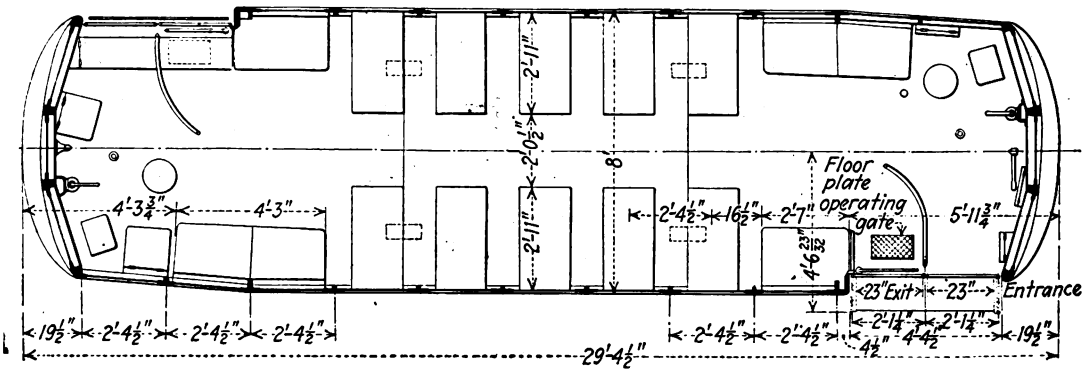


GENERAL PLAN OF CHICAGO SAMPLE SINGLE-TRUCK, DOUBLE-DOOR SAFETY CAR

the gate. The resulting depression of the treadle releases the gate, so that when the doors are opened by the operator at a stopping point passengers are free to alight by pushing the gate open. The gate is counter-weighted to swing shut automatically. The mechanism is very simple, but in designing the apparatus it was found very important to obtain reliable operation with a minimum treadle depression. The equipment now in service requires a treadle depression of less than ¼ in. for successful operation. The general appearance and arrangement of the barrier and treadle are illustrated in the accompanying photographs.

These barrier gates have been in service on the sample single-truck car since the early part of September, 1921, and on the double-truck car since the middle of December. They have been carefully studied under various operating conditions and have been found to accomplish their purpose in an entirely satisfactory manner. They successfully separate the entering and leaving passengers at points of heavy interchange and require no supervision from the operator. Both outside doors are opened and closed simultaneously from the brake valve handle.

Observations on the operation of this gate mechanism have recently led to a further development. It was originally believed, and has since been demonstrated by full size working models, that it is not only feasible to separate the entering and leaving passengers by a barrier such as has been provided on the two sample cars but that the exit door itself can be used for this purpose and made entirely automatic in its operation. That such operation can be made practical and safe has also been demonstrated.

The automatic exit door as now constructed in this full size model is operated by an independent door engine mounted on the header. The valve of this engine is controlled by the same kind of floor treadle that was used to release the gate barrier. The closing motion of the valve after a passenger has left the treadle is delayed in such a manner as to provide plenty of time to enable him to clear the door before it starts to close. The device is also so constructed that a succession of passengers passing over the treadle will not result in flapping the door back and forth.

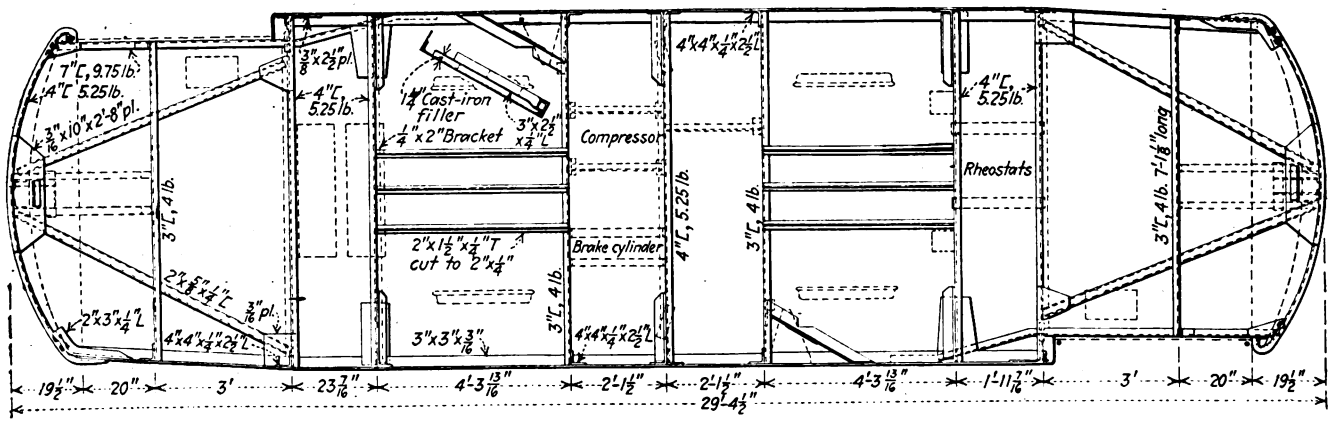
This automatic door arrangement has been assembled at the West Shops of the company. It is believed that the application of this device to cars in service will prove its practicability and solve an important and difficult problem connected with one-man car operation.

SINGLE-TRUCK CAR CONSTRUCTION FEATURES

Two photographs of the sample single-truck car are included, one showing a three-quarter view of the completed car and the other a three-quarter view of the steel frame. The general dimensions are as follows:

Length of car over bumpers	29 ft. 4½ in.
Length over corner posts	17 ft. 4½ in.
Width over side girders	8 ft.
Seating capacity	36
Width of aisle	24½ in.
Entrance and exit passageway widths	23 in.
Height rail over trolley boards	10 ft. 6 in.
Height rail to top of floor	37½ in.
Height bottom of side girder over top of side post	6 ft. 11 in.
Height top of floor to top of arm rest	24½ in.
Side post centers	28½ in.
Wheel base of truck	8 ft.

The seating arrangement and floor plan are shown in the accompanying drawings. Ten cross seats of the reversible type with full spring cushions and thin type backs are provided. They are rattan covered and are 35 in. from inside lining of the car over the aisle plates. These seats are a decided improvement in comfort, appearance and weight over those generally used in cars of this type. They weigh 49½ lb. per seat as against 51½ lb. for the non-cushion seats provided as standard equipment. Longitudinal seats are



STEEL FRAME CONSTRUCTION OF SINGLE-TRUCK CHICAGO SAFETY CAR

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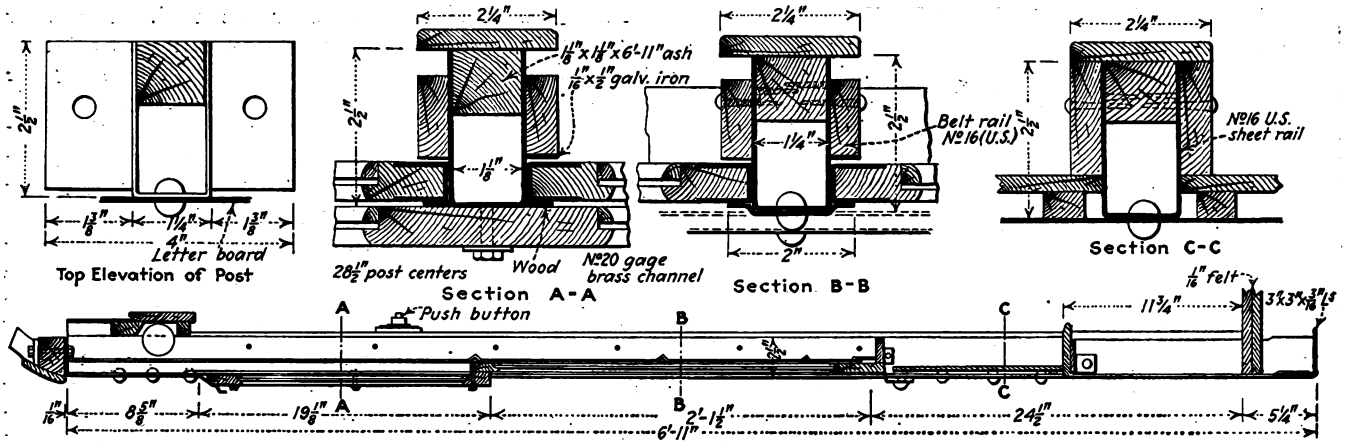


SPECIAL DESIGN OF SIDE POST FOR CHICAGO SAFETY CARS

placed at the ends to allow space for the movement of passengers. Folding seats are provided for use at the rear end of the car. The platform floor is continuous with the body portion. By carrying the floor only 27⅞ in. above the rail, it was possible to make the step 14 in. above the rail and 13⅛ in. below the car floor. This low step height was considered desirable for facilitating the movement of passengers. The low floor entailed the use of shallow wheel boxes over the wheels.

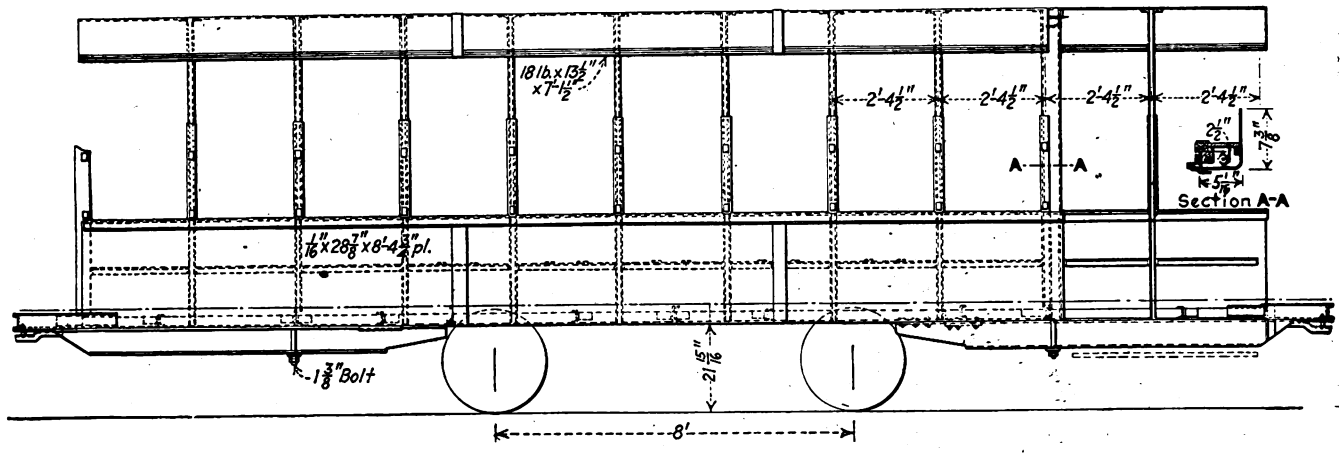
For the purpose of improving the appearance of the car, the side framing is tapered toward the center from the second side post to the vestibule corner post. The wide panel at the right-hand vestibule corner post, as one enters the door, which appears on many of the present type single-truck cars, has been eliminated. The body header is carried from the corner post to the opposite side post and the curvature of the bumper and dash have been increased.

The construction of the side posts is one of the features that have made possible the light weight obtained. They are clearly illustrated in the accompanying photographs and drawings. They are made of No. 16 gage sheet steel formed into a "U" shape with the closed side of the U out. The completed post is 1¼ in. wide x 2½ in. deep. Into the open end of the "U," which faces toward the interior of the car, a 1⅛ in. x 1⅞ in. wood filler is screwed to form a screwing strip for the parting strips and pilasters. The closed side of the "U" is riveted to the side girder with a single row of ⅝-in. rivets. The fillers are arranged so that they can be readily removed for painting the interior of the posts whenever it becomes necessary. To provide outer guides for the lower sash, capping pieces, also formed of No. 16 gage steel, are riveted to the closed side of the "U" between the belt rails and the upper sash. This construction is considerably stiffer than the "T" iron type of post or the types of wooden posts generally used and is lighter than either.

This type of post was adopted after a thorough test of various designs in use and under consideration. The tests were conducted primarily to determine the stiffness of the sections both in a direction parallel with and across the car. They were fastened for the tests in a manner similar to their actual installation in the side girder. The load was applied at a point corresponding to the location of the top plate. Stiffness of the member combined with light weight were the primary considerations which led to the adoption of this design. It also makes a convenient and inexpensive design for assembly into the steel frame. The sides of the "U" are flanged out at the upper end to form a footing for the top plate and carlines.

STRUCTURAL DETAILS

The corner posts are formed of No. 16 gage steel flanged at the upper end to form supports and ties for the body top plates, body header and vestibule door header. The side girders are formed of No. 16 gage steel reinforced at the lower edge with 3-in. x 3-in. x ⅜-in. angles and at the top edge under the belt rail with 1¾-in. x ¼-in. flat bars. The belt rails are made of No. 16 gage steel formed to shape and extending in between the posts as a support for the arm rests. The cuts in the belt rails for the posts



STEEL FRAME CONSTRUCTION OF SINGLE-TRUCK CHICAGO SAFETY CAR

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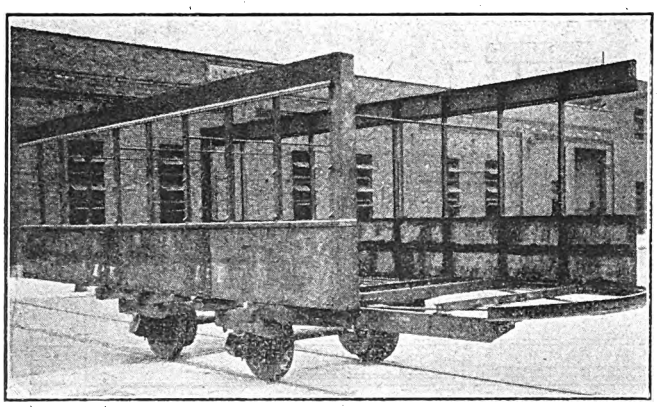


STEEL FRAME OF CHICAGO SINGLE-TRUCK SAFETY CAR

were made in such a way as to produce two clips extending alongside each post, which are riveted in place. This produces a substantial tie between the side posts and the belt rails.

The platform knees are made of 7-in., 9¾-lb. channels. The bumpers are 4-in., 5¼-lb. channels with the flanges turned out. Platform braces are 2-in. x ⅝-in. x ¼-in. channels, riveted under the cross members and tied to the 4-in., 5¼-lb. channel end sill with gusset plates. The main body cross sills are 4-in., 5¼-lb. channels and the intermediate cross sills are 3-in., 4-lb. channels.

The letterboards are formed of No. 18 gage steel and are flanged over the tops of the side posts to produce a horizontal stiffening member at this point and also a substantial support for the top plate and carlines.

Steel carlines of 1¼-in. x ¼-in. bar steel are set on edge over each side post. An ash strip is bolted to each of these carlines and intermediate ash carlines of lighter section are provided between the side posts. The body roof is made of ¼-in., three-ply poplar "Haskelite," scarfed and glued across the car at the center to form a continuous panel. The vestibule hoods are made of tongue and grooved 5/16-in. poplar sheeting butt jointed to the body roof. The header carline under the joint is rabbeted to allow the roof to come flush. The headlining is ⅛-in., two-ply "Haskelite."

Two ½-in. thicknesses of floor are used. The lower is of fir and the upper of maple, separated by tarred felt. Aisle floor strips are formed by rabbeting the floor boards instead of using separate strips.

The body headers are paneled with 5/16-in., three-ply "Haskelite," with gum toward the interior of the car and poplar on the vestibule side. The body side lining is made of 5/16-in., three-ply "Haskelite."

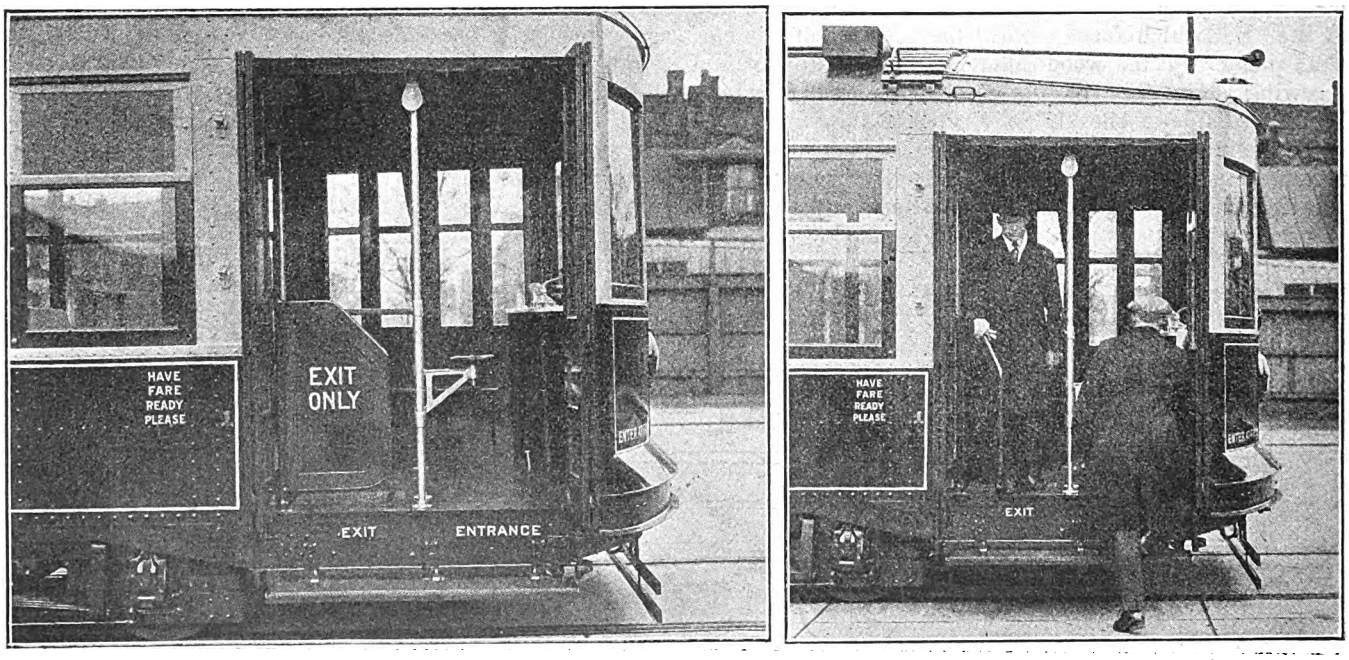
The upper sash are continuous, ⅝ in. thick, and are fastened to the side posts with ¾-in. stove bolts. Brass washers and nuts are used on the outside to facilitate ready removal for repairs. The lower sash are of wood arranged to raise and are provided with brass channel wearing strips on each stile. The window guards are constructed of brass tubing in two sections per side, arranged so that they can be readily removed or swung down below the glass line. The body side curtain rolls are exposed on the interior of the car, the fittings at each post being covered by a small formed cap of brass. The platform railings and stanchions are made of 1-in. and 1¼-in. aluminum tubing. Electric heaters of the truss plank type are used with a thermostat regulator. The Safety Car Devices Company air equipment is installed complete. The pneumatic door engines are carried over the header.

The car is carried on a Brill 79-E1 truck of 8-ft. wheel base, designed to give the low floor height obtained. The wheels are 26-in. diameter with A.E.R.A. standard E-1 axles. Two General Electric 264 motors are used and K-63 controllers.

DOUBLE-TRUCK CAR CONSTRUCTION FEATURES

In planning the construction of one-man cars, it was felt that increased comfort to passengers, improved riding qualities and better facilities for avoiding congestion could be obtained in a double-truck than in a single-truck car. It is also apparent that a double-truck car will fit a wider range of operating conditions in a large city. Hence it was decided to build a double-end, double-door, double-truck, one-man safety car for experimental purposes.

The sample double-truck safety car was built along



AT LEFT, SEPARATE ENTRANCE AND EXIT, WITH AUTOMATIC LOCKING BARRIER TO PREVENT ENTRANCE ON WRONG SIDE. AT RIGHT, DEMONSTRATING DOUBLE PASSAGEWAY AND LOW BARRIER AS RELEASED FOR EXIT AS PASSENGER STEPS ON TREADLE ON PLATFORM

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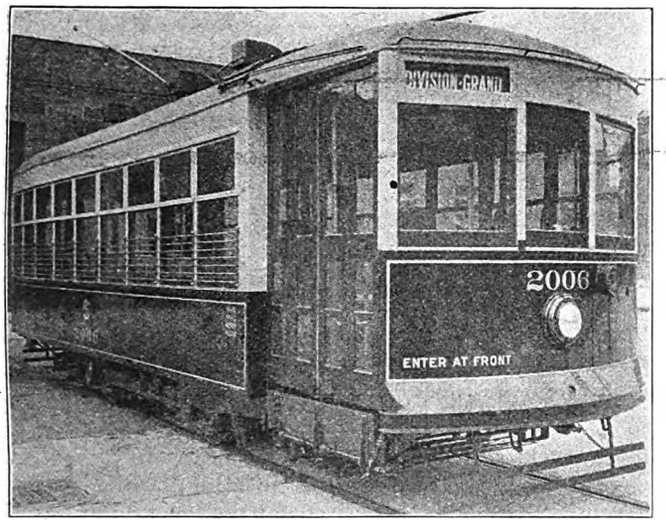
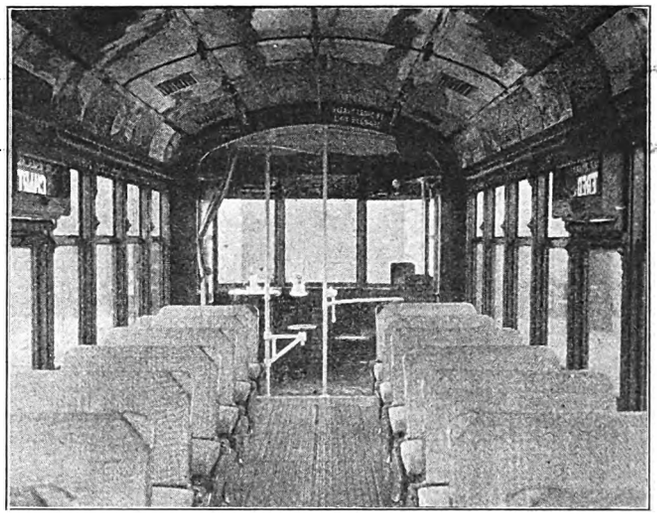


CHICAGO SAMPLE SINGLE-TRUCK, DOUBLE-DOOR, ONE-MAN SAFETY CAR



GENERAL INTERIOR APPEARANCE OF DOUBLE-TRUCK SAFETY CAR. NOTE WIDE AISLE

the same general lines as the single-truck safety car. The post centers were made 29½ in., as compared with 28½-in. on the single-truck car. The width was increased from 8 ft. over the girders to 8 ft. 4⅜ in. over the girders, or 8 ft. 6 in. over the drip rails. The aisle width was made 28⅞ in. over the end plates of the seats. This wide aisle is considered very essential, as it enables and encourages free movement of passengers to the rear end of the car and eliminates a great deal of congestion at the front end. Experience with the car in service has demonstrated that the passenger load is handled with greater ease and less confusion and crowding than is the case with the single-truck cars having narrow aisles.

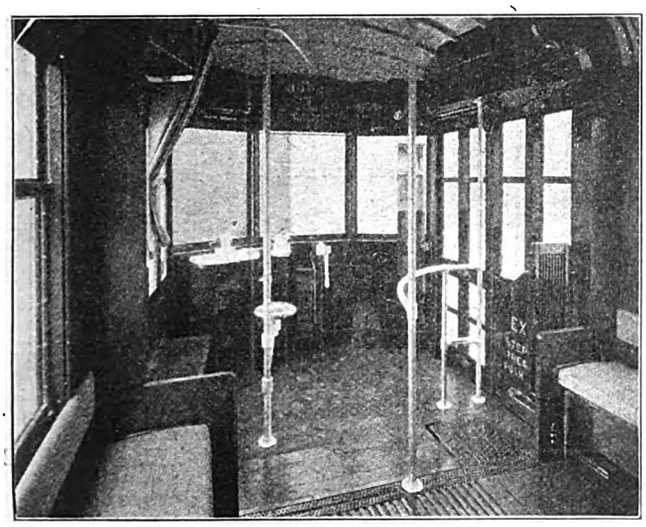
Careful consideration was given to the question of extending the body floor continuously over the platform without dropping the latter. This construction was abandoned, however, due to the desire to obtain a minimum step height from the pavement to the platform to facilitate rapid loading and at the same time obtain sufficient clearance under the floor for the proper installation of the apparatus of a double-truck car of the short truck centers adopted. The platform was dropped 6 in. below the body floor, resulting in step heights of 13 in. and 12 in., respectively, from rail to platform to floor. The end sills were offset 1⅝ in. to provide truck clearance.

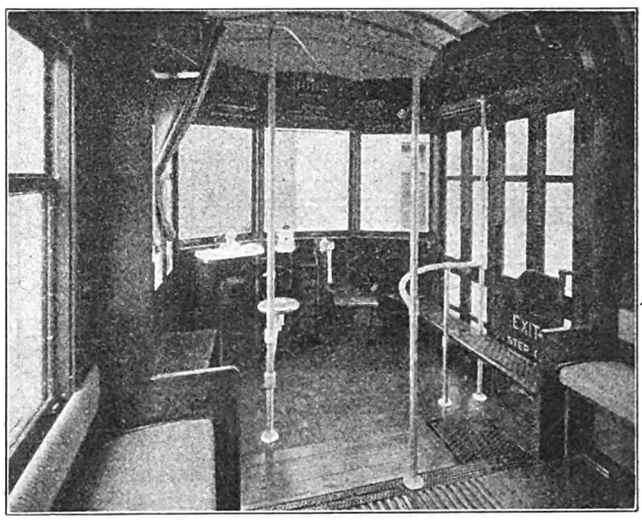
The proper length for a car of this type is difficult to determine and depends to a large extent upon local conditions. The use of an additional window section 29½ in. in length would have resulted in greater clearances and a better distribution of apparatus under the car. Whether the addition of one or even two more window sections to a car of this type would prohibitively increase the length is a question to be determined by experience in actual service. In making a comparison of weight between this car and other designs in use, it must be borne in mind that the addition of several window sections would result in correspondingly increased seating capacity with comparatively small increase in weight, thus greatly decreasing the weight per seat.

The general dimensions for the double truck safety car are as follows:

Length over bumpers	37 ft. 2 in.
Length over corner posts	23 ft. 8 in.
Width over side girders	8 ft. 4⅜ in.
Seating capacity	45
Width of aisle	28⅞ in.
Entrance and exit passageway widths	25½ in.
Height rail over trolley boards	10 ft. 11½ in.
Height rail to top of floor	31 in.
Height bottom of side girder over top of side post	7 ft. 1½ in.
Side post centers	29½ in.
Truck centers	15 ft. 6 in.

The design of side posts and side girder construction is the same as that used for the single-truck car, with





FRONT AND REAR PLATFORMS OF DOUBLE-TRUCK SAFETY CAR SHOWING SEAT ARRANGEMENTS, EXIT BARRIER AND TREADLE, ALUMINUM STANCHIONS, ETC.

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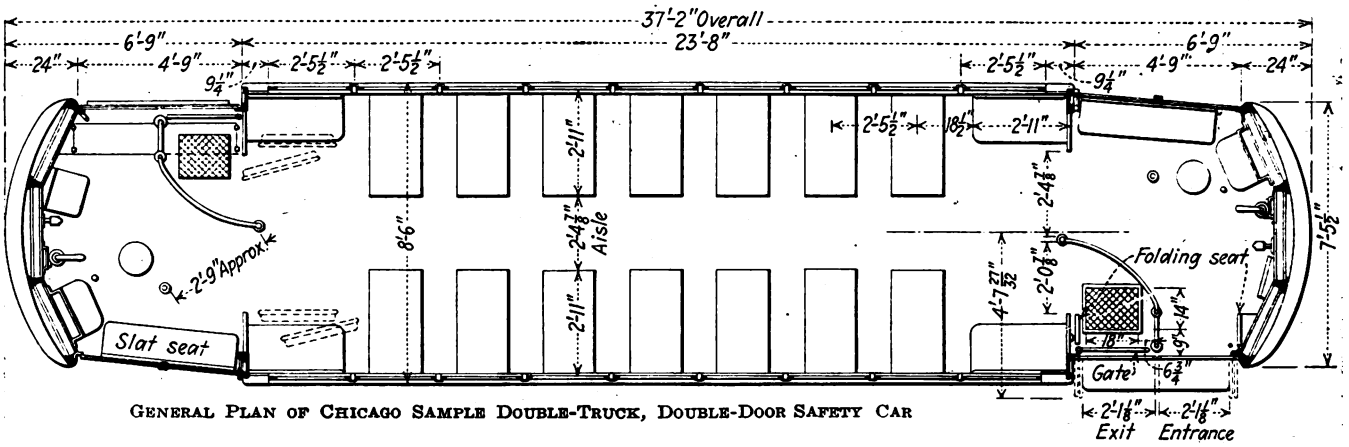
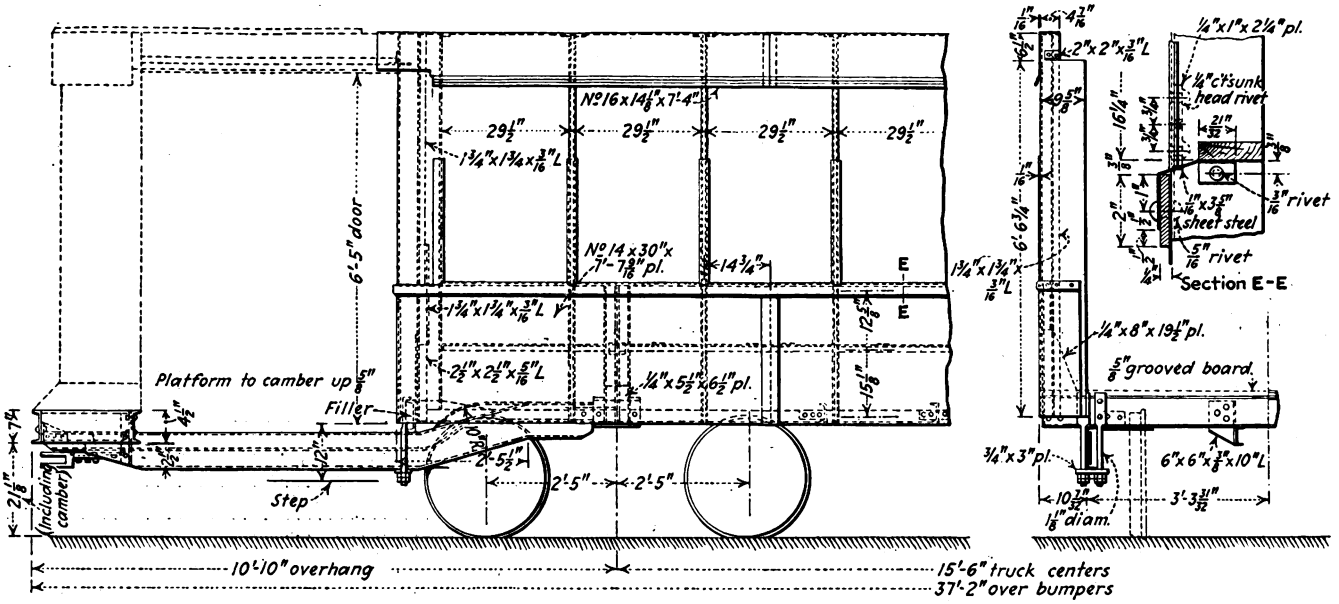


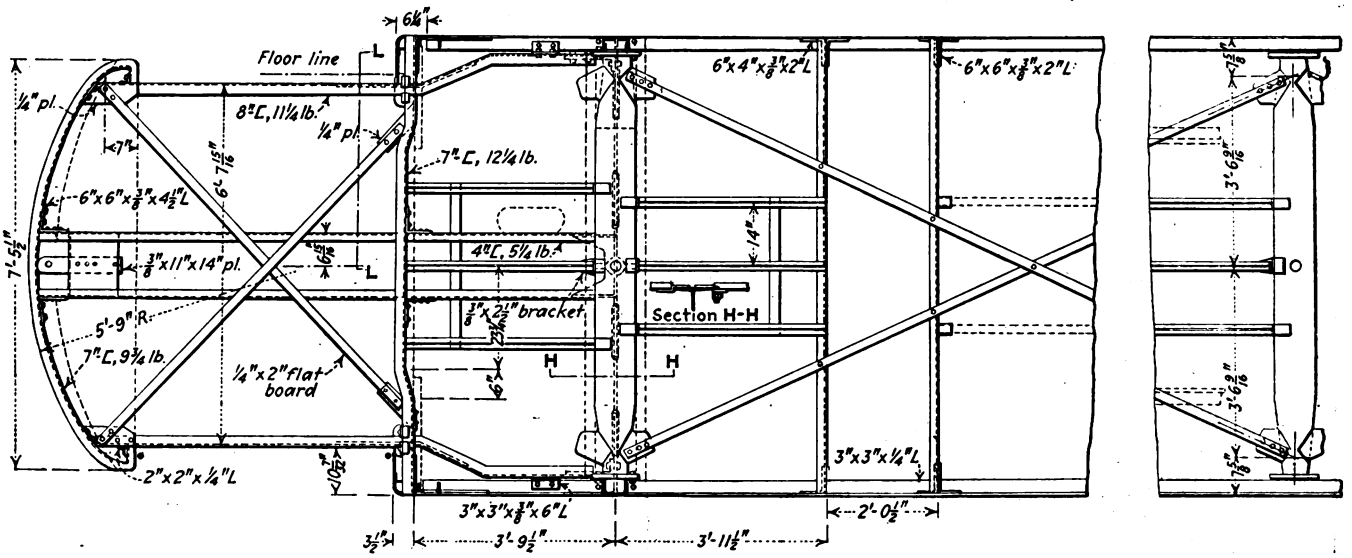
GENERAL PLAN OF CHICAGO SAMPLE DOUBLE-TRUCK, DOUBLE-DOOR SAFETY CAR

the exception that No. 14 gage sheet steel was used for the girder plate and that the letter-boards are made of No. 16 gage steel. Provision is also made for the use of storm sash over the lower sash.

CONSTRUCTION FEATURES OF DOUBLE-TRUCK CAR

The roof construction is very similar to that used on the single-truck car, with the exception that the three-ply "Haskelite" roofing was made in three sections butt jointed and fastened at the carlines. As in the single-truck car, the vestibule hoods were made of tongued and grooved poplar sheeting, while $\frac{3}{16}$-in., three-ply "Haskelite" was used for the headlining. The platform knees are 8-in., 11¼-lb. channels and the bumpers are 7-in., 9¾-lb. channels with the flanges turned out. Two 4-in., 5¼-lb. channel center knees were put in extending continuously from the bolster to the bumper. The resulting structure gives a very rigid stiff platform. Two thicknesses of $\frac{5}{8}$-in. flooring were used, the lower of fir and the upper of maple. The





STEEL FRAME CONSTRUCTION OF DOUBLE-TRUCK CHICAGO SAFETY CAR

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WEIGHT ANALYSIS OF SINGLE AND DOUBLE TRUCK ONE-MAN SAFETY CARS, CHICAGO SURFACE LINES

	Single Truck		Double Truck	
Steel frame including posts and letterboard	.....	1930	.....	4600
Car Body Structure				
Floor sills and flooring				
Floor sills	.....	....	.....	....
Bottom floor (fir)	.....	....	.....	....
Floor paper	.....	....	.....	....
Top floor (maple)	.....	....	.....	....
Trap doors, etc.	.....	....	.....	....
Crown piece	775	....	1,255	....
Body Framing				
Side post fillers	.....	....	.....	....
Vestibule posts	.....	....	.....	....
Body and vestibule top plates	.....	....	.....	....
Foot rail	.....	....	.....	....
Vestibule ribs	.....	....	.....	....
Curtain rails and blocks	.....	....	.....	....
Truss plank	.....	....	.....	....
Arm rest	.....	....	.....	....
Top sash frame	.....	....	.....	....
Vestibule sash and dash rails	.....	....	.....	....
Upper dash metal (No. 18 gage steel)	450	....	559	....
Exterior Finish				
Lower dash meal (No. 16 gage steel)	.....	....	.....	....
Exterior moldings, etc.	163	....	178	....
Body header structure, including woodwork at corner posts	87	....	162	....
Roof Structure				
Steel body and vestibule carlines	.....	....	.....	....
Wood body and vestibule carlines	.....	....	.....	....
Rails and blocking	.....	....	.....	....
Body roofing	.....	....	.....	....
Vestibule roofing	.....	....	.....	....
Roof canvas and molding	.....	....	.....	....
Trolley boards and cleats	525	....	805	....
Doors and Sash				
Entrance and exit folding doors and barrier	.....	....	.....	....
Vestibule partitions	.....	....	.....	....
Door track, brackets, shafts, steps, operating mechanism	.....	....	.....	....
Body lower sash, locks, etc.	.....	....	.....	....
Glass for doors and sash, including upper sash	.....	....	.....	....
Door engines, covers, pans	.....	....	.....	....
Floors and step treads	1,117	....	1,452	....
Interior Finish				
Dash interior finish and facing, including wiring box and engine housings	.....	....	.....	....
Headlining and moldings, including advertising molding	.....	....	.....	....
Pilasters, parting strips and sash racks	.....	....	.....	....
Body inside lining	320	3437	350	4761
Car Apparatus and Fittings				
Seats				
Body cross seats	.....	....	.....	....
Longitudinal and folding seats	709	....	900	....
Railings, stanchions and grab handles including motorman's seat	102	....	147	....
Destination and route sign boxes, curtains, mechanisms, etc.	32	....	92	....
Car and motorman's curtains	75	....	75	....
Window guards	82	....	82	....
Ventilating equipment	49	....	89	....
Drawbar	20	....	25	....
Fare register and mechanism	77	....	98	....
Life guards and splash guards for apparatus	207	....	285	....
Auxiliary Electrical Apparatus				
Heaters and thermostat	.....	....	.....	....
Buzzers	.....	....	.....	....
Lights and switches, compressor fuse, etc.	.....	....	.....	....
Headlight	178	....	248	....
Auxiliary wiring and conduit	68	....	98	....
Miscellaneous				
Trolley catchers	.....	....	.....	....
Gongs	.....	....	.....	....
Motorman's climbing steps	.....	....	.....	....
Handstraps	63	1662	63	2202
Electrical Equipment				
Motors, pinions and gear cases	1915	....	3,864	....
Motor wiring and conduit	105	....	175	....
Controllers and resistance	477	....	892	....
Trolley, lightning arrester, fuse box, choke coils, etc.	305	2802	264	5195
Brake Equipment				
Compressor, reservoirs, governor, hangers and strainers	665	....	953	....
Air piping, valves and fittings	574	....	324	....
Brake cylinder and foundation rigging	191	....	356	....
Hand brake and rigging	94	....	139	....
Sand boxes and traps	59	1583	59	1831
Trucks				
Trucks framing, bolsters springs, transoms, etc	2,780	....	4,658	....
Axles, wheels, gears	1,913	....	4,148	....
Truck guards	.....	4693	150	8956
Paint and varnish	.....	110	.....	225
Miscellaneous bolts, screws, etc.	.....	158	.....	280
Total weight	.....	16,375	.....	28,050

construction of aisle strips is the same as for the single-truck car.

The full Safety Car Devices Company equipment was installed. With the co-operation of the manufacturers the door engines were obtained in aluminum. Aluminum railings and stanchions were used throughout. This material was also used for the heater conduit carried along the truss plank on the interior of the car, and for all air piping and fittings. Care was taken in installing aluminum pipe with iron apparatus thoroughly to coat the joint with heavy insulating varnish to prevent any tendency toward galvanic action. The total saving in weight resulting from the use of aluminum was 450 lb. Cross-seat heaters of a special light weight design manufactured under the company's specifications and saving 125 lb. per car were used. These were made up in three-coil, 400-watt units for the body heaters and six-coil, 800-watt units for the two platform heaters, all coils being interchangeable.

The trucks are of the Brill 77-E1 type, 5-ft. 10-in. wheel base with 26-in. diameter wheels and A.E.R.A. standard E-2 axle. They are specially designed for this weight of car. Four Westinghouse 508 motors, inside hung, are used with K-35 control. The car is equipped with a line switch carried under the floor, instead of the ordinary circuit breakers, and the platform controllers are provided with ratchet switches for the operation of the line switches. A new type of air tripping mechanism was installed in the line switch, to operate with the safety equipment. It was considered very desirable to place the current breaking apparatus under the car instead of inside the car body.

The accompanying tabulation gives a detailed weight analysis of both the single and double truck cars.

Interurban Service De Luxe

Sacramento Northern Operates Dining and Observation Car Service Between San Francisco and Chico—184 Miles Covered in About Six Hours

THE Sacramento (Cal.) Northern Railroad recently put in commission a luxuriously furnished dining and observation car, which is being operated over the company's lines from Chico to Sacramento and thence, by special arrangement with the San Francisco & Sacramento Railroad, over the lines of that company direct to San Francisco. Under this arrangement passengers are not required to change cars during the entire 184-mile trip between San Francisco and Chico.

The car makes one round trip daily. Leaving Chico at 6:10 a.m., it arrives on the Oakland Pier at 12 noon; returning, it leaves the pier at 4:55 p.m. and reaches Chico at 11 p.m. On both these runs it is a great convenience to passengers to be able to get meals en route. The new service was started Oct. 24 and after fifteen days of operation had become so popular that since then all observation-car seats have been sold out on each trip. About forty meals per day are being served in the dining room.

The car has an inclosed observation end which seats twenty passengers and there are accommodations for twelve more in a smoking room, or a total of thirty-two seats for which an extra fare is paid. This is in addition to the dining room, which seats twelve. The extra fare is 50 cents for the through trip, thus the seat revenue of the car is $16 per trip when all seats are sold. Passengers holding only ordinary tickets have access to the dining room when meals are being

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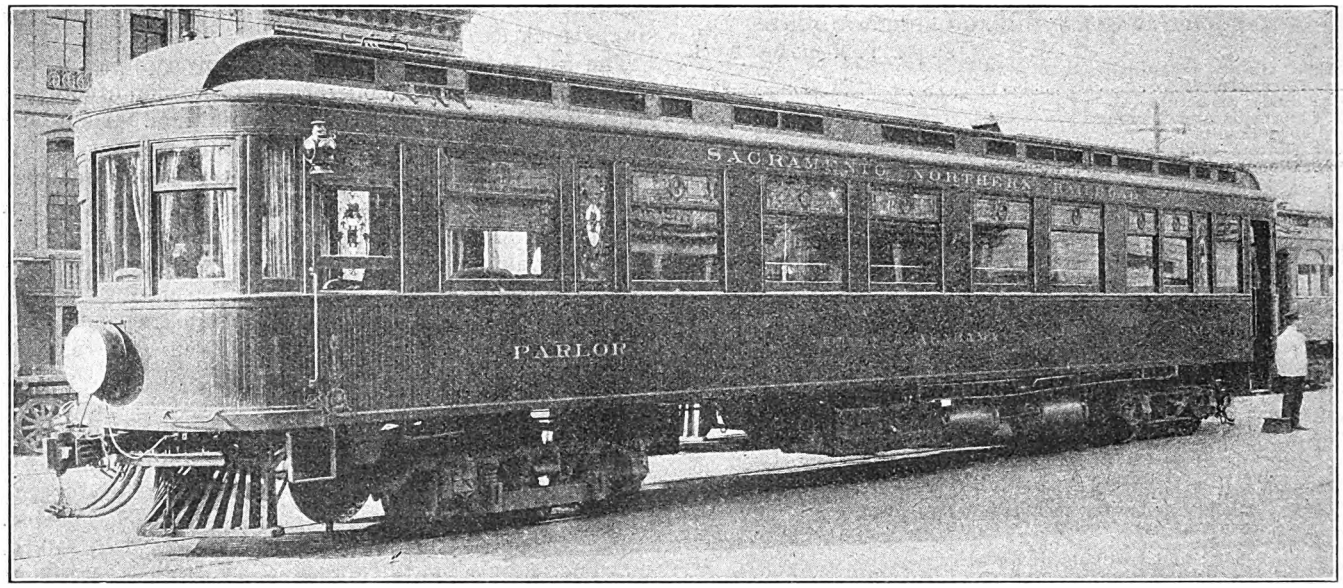


THE DINING AND OBSERVATION CAR WHICH MAKES A ROUND TRIP DAILY BETWEEN OAKLAND PIER AND CHICO

served, but cannot ride in observation or smoking compartments without extra fare tickets.

The car was owned by H. E. Huntington and was used as his private car when he was president of the Pacific Electric Railway. The idea of refitting it and using it as a dining and observation car was conceived and carried out by J. B. Rowray, general manager of the Sacramento Northern Railroad. The car is 65 ft. long and weighs 96,300 lb. It has a steel frame with wood sheathing and is attractively lined with inlaid mahogany.

The changes necessary to make it suitable for the present service were made in the Sacramento Northern shops at Sacramento. The most important of these was the substitution of the dining room for a suite of bedrooms and the changing of a side door from the rear end to the front. An ample, well-arranged kitchen was part of the original equipment. The crew of the car consists of four men, a steward, a chef and two assistants.

Since this dining car service has become popular with such rapidity other electric railways that operate over long stretches have shown much interest in its operation.

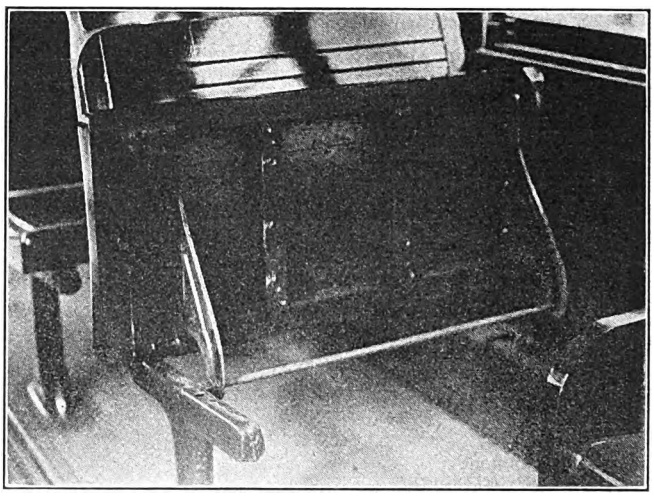
Half Million of Utility Security Holders in Illinois

IN A recent address before the Illinois Independent Telephone Association, John F. Gilchrist, vice-president of the Commonwealth Edison Company, declared that there were at present at least 500,000 holders of utility securities in the State of Illinois, and these with their families constitute almost one-third of the population. While he thought this was a very good showing, he did not consider it enough, and the utility companies should not be satisfied until from 60 to 80 per cent of all the families in the state have within the family circle at least one member who is a security holder of a utility. Utilities, in the opinion of the speaker, possess a number of advantages for this kind of customer ownership.

The following points were listed by Mr. Gilchrist as questions which should be considered by a person considering an investment: (1) What do the physical properties consist of? (2) Can you actually see these properties? (3) What is the financial position of the company? (4) Do you know the character and reputation of the management? (5) Are the products or services supplied absolutely essential to the public? (6) What are the probable future demands for these products? (7) Are the earnings steady or do they fluctuate? (8) Can the business continue under the stress of adverse conditions? These qualifications, he said, are answered by a utility probably better than by any other type of corporate investment.

Anti-Tipping Device for Car Seats

THE accompanying illustration shows a device used by the International Railway at Buffalo, operated by the Mitten Management, Inc., to overcome the tipping of cushions. A ½-in. rod is placed in between the seat casting which fastens to the side of the car and



ANTI-TIPPING DEVICE FOR CAR SEATS

the aisle seat casting upon which ride two flat iron guides which are fastened to the bottom of the seat. This arrangement allows the seat to be raised by simply pulling it forward an inch or two and raising it. Since the installation of this anti-tipping device the accident claims of the company on account of passengers falling off seats, which were previously very numerous, have been entirely eliminated.

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Insurance for Electric Railways

Safeguards Service by Stabilizing Credit—An Efficient Aid in Handling Labor—Affords Opportunity for Operating Economies—Suggestions for Executive Action—Summary of Types and Classes Available for Street Railways

THE intelligent consideration of the insurance needed for any electric railway property and organization involves first a study of the whole system in order to determine just what types and amounts of insurance are necessary, are economical and are useful considering all property, financial, operating and labor conditions.

The next step involves placing the insurance and securing terms. This necessitates a knowledge of the reputable insurance companies, a study of policy clauses and their modification to suit the local situation, a legal consideration of the contractual features of the policy and finally a consideration of the rate for each policy. The rate involves the cost element and necessitates a knowledge of insurance, of methods for securing rate reductions and of methods for obtaining and making insurance classifications.

The final step in insurance is a consideration of the method for maintaining insurance inspection and for instituting and operating the so-called welfare types of insurance. This final step is one of the most important, as insurance policies are not courtplasters to paste on an industrial body in any location. The specific wounds must be found and given first aid before the policy will cure the trouble.

There are many types of insurance applicable to railway organizations. The principal ones are:

1. Fire insurance.
2. Compensation insurance.
3. Group life, accident and health insurance and old age pensions.
4. Public liability insurance.
5. Property damage and collision insurance.
6. Use and occupancy insurance.
7. Fidelity insurance.
8. Burglary insurance.
9. Catastrophe insurance.
10. Boiler and flywheel insurance.

Each of these types is subject to many classes of policies as applied to buildings, street cars, automobiles, power houses, employees and the public, and the specific railway property and local conditions fix or determine the exact rates and details of the policies. Insurance is a financial protection and, other things being equal, the railway property wants protection at minimum cost and should base the amount of its insurance on financial considerations. The exception is welfare insurance, one of whose functions is to increase the morale of employees. In this type of insurance the value and the protection are intangible elements that involve many factors associated with public relations and labor relations.

Fire Insurance Permits Economies

Fire hazard in the electric railway industry arises in the shops and carhouses to the greatest extent because of the combination of risks introduced by the presence of cars, paint, oil, wood, varnish, waste, etc., in conjunction with grounded electric circuits. The best preventive of fires and the lowest insurance rates will result when a general policy is followed of building isolated structures of fire-resisting nature with compartments for the isolation of all inflammable and explosive material, combined with clean premises maintained by constant inspection and supervision. In existing structures, however, rates can often be reduced by adequate and inexpensive changes which lower the hazard. There are many instances where a few improvements to decrease fire hazards resulted in a saving for the first year that paid for the cost of the improvements. Such was the case on the East St. Louis & Suburban Railway, where the company co-operated with the Electrical Inspection Bureau, made a few changes in structures and methods and reduced the rate from 62.88 to 39.2 cents per $100 of policy. The dollars thus saved were used to add to the amount of the policy (see ELECTRIC RAILWAY JOURNAL, Feb. 26, 1921, page 397).

Fire insurance may be carried by any one of three methods. A railway organization can carry its own insurance or it can join an association of railway or other companies organized for mutual insurance purposes, or it can take out policies with one or more stock fire insurance companies. The size of the property and the maximum fire risk on it have an important bearing on the decision.

A large company with properties so scattered as to have a relatively small aggregate risk in any one location can often afford to assume a certain portion of its risk, while a smaller property could not venture to do so because of the financial effect of the same risk in case of loss. Then again advantages may be offered by an excess type of fire insurance policy whereby the insurance company pays a loss when it exceeds a stated sum, say $100,000, then on up to another, say $300,000.

In 1910 the Philadelphia Rapid Transit Company carried $18,500,000 of fire insurance at a rate of 50 cents per $100. By means of improvements and better inspection the rate was reduced to 25 cents per $100 in 1919. During the period from 1911 to 1918 the company paid over $600,000 in insurance premiums and received in return less than $60,000 for fire losses. On this account the company decided on Dec. 31, 1918, to carry and assume 33 per cent of its own risk, after having made a survey of its property which fixed the greatest possible loss from any one fire at $250,000.

Inspection and Rates

Commercial insurance organizations have agreed upon certain rates for certain standardized classes of fire insurance risks, the rates varying according to the condition of the properties in each one of these classes. The insurance organizations have also established inspection bureaus, to assist them in the intelligent setting of a rate on any specific building in any specific property. Insurance companies, to summarize, have a co-ordinated organization for handling fire insurance. The general method of procedure is for the inspectors of the insurance company to inspect each risk or each property, divide it into separate classes, fix the rate for each class determined by the rules and regulations

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of insurance as agreed upon by underwriters and thus build up a sum total of insurance which is prorated among several companies or handled by one company depending upon conditions.

In certain kinds of fire insurance the inspection service, as such, is a most valuable portion of the insurance covered by the policy. Electric railways and many other insured organizations, as a rule, have comparatively little intimate knowledge of fire insurance, particularly with respect to how rate classifications are made up and how changes on their property can secure them reduced rates. Inspectors of the insurance company make a rate classification as fixed by the situation when the policy was granted and have no incentive but competition to make constructive suggestions whereby reduced rates can be secured.

In most cases an allowance of 10 per cent in the insurance rate is made by rating associations from the 80 per cent co-insurance clause rate for the substitution of the 100 per cent clause. A blanket insurance policy usually requires a 90 per cent or 100 per cent clause. On properties liable to fluctuate in value, the lower percentage of co-insurance is highly desirable to take care of increases that may occur in the value of the property.

Fire insurance as a commercial business does not pay exorbitant returns on the volume of business done. For example, the results of ten years' operations of ninety-four large fire insurance companies show a net profit of only 2.81 per cent on a total business of over $3,700,000,000. These companies paid out for losses 49.36 per cent of their collections during the decade ending Jan. 1, 1921. Operating expenses were 37.78 per cent and increased liabilities amounted to 10.05 per cent. These same companies in 1906, on account of the San Francisco fire, paid out $15,000,000 more than the profit derived from all underwritings obtained in the last decade. The direct return on the volume of business, therefore, in fire insurance is not great, and the insurance companies derive their profit largely from the interest on their reserves, which are essential to the financial integrity of each company. The return based on the capital invested in these ninety-four companies was not stated in the statistical report from which the above figures were obtained.

Welfare Insurance Should Be Co-operative

There are certain classes of insurance which are intimately associated with the personnel of a street railway organization. Group accident and health insurance, group life insurance, and old age pension schemes are examples of this type of insurance. All of these classes are handled by insurance companies with the exception of old age pension schemes, which must function as a part of the financial and labor system of the railway property.

The types of insurance, however, that require the most study from the manager are group health and accident and group life insurance. These are intimately tied up with public relations, labor relations and operating conditions. No standardized treatment can be followed, since every railway company has a different personnel and operates under different conditions.

The best practice in connection with such insurance is for the company to make a detailed study of the organization and of operating conditions and then get the employees themselves interested in the plan. If the heads of the various departments are called together and the insurance plan is made clear to them and also the fact that they themselves will pay a portion of the insurance cost or dues, then these men through asking and answering questions help to formulate an insurance of the type suited to the local conditions. These same executives of departments going out among the men are competent to answer all questions arising in connection with the insurance, and the whole operating organization, including the wives of the employees, must be permeated with an understanding of the type of insurance, why it is carried, how much it costs and who is bearing the cost, until it becomes popularized and is "sold" to the whole operating force and their families. When this procedure is followed, success generally attends the inauguration of this type of insurance.

Often the insurance company may afford expert advice and assistance in connection with welfare work for the personnel of the companies who are insured by them, but, if furnished, this type of insurance is successful only when the employees as a whole understand and approve the whole plan. Otherwise it may be received with suspicion and produce an antagonistic attitude which often follows paternalism in management.

Group insurance and pension plans can be handled in many ways. Some form of co-operative scheme between employee, employer and the commercial insurance company is the general practice in the railway industry. Group insurance of this type is usually divided into two classes. The first comprises group accident and health insurance. This is usually a co-operative type of insurance developed by the employer and employee in conjunction and depends for its success on the co-ordinated efforts of the two parties to the contract. All features of such an insurance project should be discussed and worked out by a committee made up of representatives of employers and employees. The first thing to do is to decide on the plan and the amount of participation and then appoint a working committee among the employees to draft the final plan and send out a circular giving all details. The first provision in this type of insurance usually covers not only injuries resulting from employment, which are already covered by state compensation laws, but also any other injury that may occur to the employee and sickness of every kind and nature.

A typical form of group health and accident insurance would have clauses specifying the period covered, say twenty-six weeks or fifty-two weeks or longer, and providing indemnity for all injuries not included under workmen's compensation act and for all sickness at a definite sum per week, say $5, or for a definite percentage of the payroll, say one-half or one-fourth of the average compensation of the employee. A group insurance contract of this kind, as issued by the insurance company, will usually specify the number of employees or give their names and will state the amount covered in the insuring provision for each employee. The employee will then receive from his employer an individual policy for his coverage under the contract, and the employer settles all claims through his own claim organization. To cover the cost it is quite common to have an arrangement whereby a percentage of each employee's salary is paid into an insurance fund and another percentage is paid into the fund by the employer. The cost of such a benefit policy, based on two-thirds compensation as obtained from a large insurance company for fifty-two weeks sickness period, will vary,

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according to conditions of employment, from 1 to 1½ per cent of the payroll.

Group life insurance is usually a contract taken with an insurance company to cover a certain number or names of employees and contains the amount of insurance for each employee and the insuring provisions. The provisions usually include immediate payment of the full amount of the policy in the event of death and installment payments to the amount of the policy in the event the employee becomes totally and permanently disabled from accident or disease, prior to reaching the age of sixty. The employees may or may not pay a portion of the premium on such a group policy, depending on the internal character of the organization. Some policies are written so as to enable an employee leaving the company to convert his individual group life policy to a straight life insurance policy at a very favorable rate.

The indemnity arrangements are very different for the different organizations. In some cases, in case of death, there is a flat indemnity of $1,000 for each employee. In other cases the indemnity is in force only after an employee has been with an organization for one year. In still other cases the indemnity clauses read that $500 will be paid for each year of service until a maximum sum, say $2,000 per employee, is reached. Again, the indemnity may be based on the salary received by the employee for one or two years previous to death. The rate is usually based on the combined ages of all employees dealt with on a rated base and not on an average base. It will be from $8 to $12 per $1,000 indemnity.

The primary advantage of group life insurance to the employer is that it furnishes an incentive to the employee to remain at work with the one organization for a long period of years, and the best type of group life policy takes this feature into consideration by giving a bonus increase of indemnity per year of service. Such a clause has many advantages. It increases the sense of financial independence to the employee, reduces the cost of labor turnover, gives a solution of the transient labor problem, introduces better shop morale, provides a better class of employees and adds a certain publicity and philanthropic value to the company's name.

Pensions Combined with Life Policies

Old age pension schemes are very good to co-ordinate and hold up the morale of an organization, but they must be sound from an actuarial standpoint and they must be co-operative and not paternalistic. The cost is such that few commercial insurance companies are in the business, and most of the schemes are carried by the individual railway organizations. The individual case often requires some deviation from the fixed rules, and the co-operative company-employee plan permits of such treatment. The employee should pay for his share of the cost and should really function to operate the plan. A sense of freedom from the financial worries associated with old age and a feeling of partnership in the affairs of the company result from a properly instituted and operated pension plan.

The cost of such schemes can be computed on different bases:

1. An endowment plan or the payment of the entire reserve as insurance in the event of death and the return of the accumulated reserve before reaching the pensioning age.

2. A plan that provides for the return of the premium and accumulated interest in the event of death or retirement.

3. A plan that provides for no return of premiums in the event of death before the pensioning age is reached but with a provision for their return with interest in case the employee leaves the service.

The cost is the deciding factor, and often the clauses of the group life policy used in conjunction with the pension plan will affect the cost and clauses of the pension plan. The financial aspect varies with the policy, but those policies which have proved most satisfactory provide for a minimum flat payment of so much per month with an adjustment based on salary and years of service. The employee contributes on a monthly basis a fixed sum which is most conveniently handled when it is subtracted from the monthly payrolls. At least four classifications of employees based on salary or wage earnings can usually be made to advantage in most railway pension systems. The pension type of insurance is the most intricate and delicate to administer from a financial and psychological standpoint, yet it offers opportunity for the greatest return in increased *esprit de corps* of any type of so-called welfare insurance.

The commercial insurance companies will write group life policies, but, ordinarily, pension schemes are handled on a participating basis by the employer and the employee in combination with the individual life indemnity. In other cases the employer himself pays the pensions through a reserve fund. The general provisions of a pension plan, worked out by the employer and employee, usually provide that pension shall begin at a certain age, say sixty or sixty-five years, and after twenty to twenty-five years of service the amount of the pension shall be from $100 per year up, with provision for a certain number of payments in the event of death before receiving the specified number of payments. At the same time life insurance begins at, say $500, and increases to a certain figure of, say, $2,000, at the age of sixty-five years. Provisions usually are made for agreed non-forfeiture cash loan and paid-up value for every year the policy is in operation after the first. Another clause in the life policy usually provides for waiver of payment by employer and employee if the insured is totally disabled before reaching sixty-five or some other stated age.

Benefit Associations Handle Insurance

Benefit associations usually function as an employee and employer organization which can care for group accident and health insurance, group life insurance and old age pensions. Each employee pays a certain amount as dues to the association and the employer pays a certain amount, as a rule, and the dues and funds thus obtained are used not only to pay for the insurance carried with insurance companies, but also to take care of welfare work and old age pensions suited to the needs of the specific organization.

In the railway industry the latest data indicate that about thirty companies have old age pension schemes, while 125 companies have some form of benefit association which pays sickness, accident and death benefits.

Compensation Laws

The subject of insurance to cover workmen's compensation law requirements is very complicated and is made more so by the differences in the state laws.

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Nearly every law is based on the old English clause "Personal injury by accident arising out of and in the course of employment," but many of the laws leave out certain of these words, such as "out of and" or "and in the course of" and the courts themselves have not clearly defined and distinguished the meanings of such phrases as "occupational disease," "accidents" and "injuries."

The local law must be complied with by each railway property and but little chance is available for economies other than the use of "safety first" methods. It would seem reasonable, however, to get better and more uniform laws through study and exact data. How much compensation in excess of the law requirements should be carried in the way of life insurance, or additional accident and health insurance, if any, is a matter for each organization to determine.

Fidelity Bonds

The use of fidelity bonds is necessary when laws require bonds from certain employees, or when the company itself wishes protection against losses caused by the dishonesty of employees. Rates for this type of insurance are fixed by the aggregate amount for each company. It is possible in this type of policy to bond each employee for a fixed sum as is usual and then to take out an extra coverage of, say, $100,000 to $250,000, which would apply to each loss caused by the dishonesty of any one of the bonded employees. This excess coverage method is claimed to make possible a small bond per employee, to secure a lower cost of insurance and to obviate the objection of bonds covering the individual employee in that, in such a case, any one loss may be and often is greater that the amount of the specific bond.

Catastrophe Insurance New

Catastrophe insurance is of recent date and is an outgrowth of the older type of insurance called common carrier insurance. It protects the assured against any excessive property damage or public liability arising from the operation of passenger cars owned, leased or operated by the railway companies. The older type insurance, called common carrier insurance, attempted to cover all claims arising from this type of catastrophe, but was not very successful. One reason for this was that a third party was introduced between the manager of the system and the public in the settlement of claims. Many petty claims involve questions of policy which are best handled by the railway organizations. Also, since it is best to settle a claim as quickly as possible, the insurance companies may cause a delay in such settlement as usually they lack the organization necessary for making such settlements.

A different condition of affairs exists in the street railway and motor bus industry than on the steam railroads as regards catastrophe insurance. On the steam railroad a serious accident is usually a collision or derailment of a passenger train which is composed of several coaches filled with passengers, and the resulting aggregate claims often amount to an immense sum. In the street railway industry the collision of two street cars would involve equipment and passengers in an aggregate sum about equal to that involved in the wreckage of one passenger coach on a steam railroad. In the event of catastrophe to a motor bus still less aggregate sums would be involved, since the passenger-carrying capacity and the investment in the vehicle is comparatively small. These features, together with the decreased liability hazard caused by slower speed and safer operating conditions, as indicated by statistics, would seem to point toward catastrophe insurance or public liability insurance as a type of insurance that could be carried by the street railways and the motor bus companies.

The new type of public liability policy for catastrophe is based on losses within certain limits. A typical form would read that the assured shall be protected under the policy only for a loss which is in excess of $25,000 for any one accident and then is protected up to a loss for that accident of $100,000, it being understood, however, that there is no limit to the number of accidents of this kind for which claims may be made during the existence of the policy. The premium paid varies with the limits set and other features.

The procedure under this policy after an accident is about as follows: The railway company begins immediately with settlements, and at the earliest possible moment advises the representatives of the insurance company of the accident and the adjustments so far made and discusses with the representative in regard to further settlements or legal proceedings. If the attorneys of the insurance company elect to litigate for claims in excess of $25,000, then they consent to bear all the law costs in connection with the litigation to a value equal to the total liability of the assured.

The premium payable for this type of policy is calculated at a rate of, say, $1 per thousand dollars of gross passenger revenue received by the railway company during the time of the policy, plus an addition of 25 per cent of the sum so calculated for the proportion of single tracks (excluding yard, carhouse and dead trackage) to the total mileage of the railway company track. The railway company agrees to pay a minimum first premium calculated at a rate of, say, $10 per passenger car in operation, and should the total premium thus calculated be less than the premium figured on the basis of gross passenger revenue, then the railway company pays a further premium equal to the excess. If the number of passenger cars is increased during the existence of the policy, the premium payment is proportionally increased and prorated over the period the cars are operated.

As an example of the application of such a policy, assume a railway company has eighty cars. At $10 per car the minimum first premium would be $800, payable at the time the policy is taken out. Assume that the gross receipts of this railway company for the ensuing year amount to $1,000,000, then at $1 per thousand the premium would be $1,000. If the total track is 100 miles, of which 30 miles is single track, then 30 per cent of the total trackage is considered as single track. Twenty-five per cent of the premium, $1,000, is $250, and 30 per cent of this amounts to $75. Therefore, the total premium on the adjustment basis at the expiration of the year amounts to $1,075. As the first minimum premium amounted to $800, the difference between $1,075 and $800, or $275, would be paid to the insurance company at the end of the year's operation.

This type of insurance is particularly applicable to small railway property where any one catastrophe might send it into the hands of a receiver. The very large companies set aside a contingent fund for the same purpose, based on a percentage of gross receipts. Most of them carry their own excess damage and public liability insurance, since the aggregate sum involved in any collision of two passenger cars would be comparatively small for the large company, even though many in-

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stances show that a collision of two cars may result in a liability settlement of over $300,000. On the small railway insurance against such a loss is often necessary to protect the stockholders. Their equity, however, is usually so large that the bondholders are reasonably well protected against any such unforeseen circumstances or disasters.

A unique application of catastrophe insurance is the policy taken out in Cleveland during a strike situation. The Cleveland Railway in 1919 took out a "strife and civil commotion" policy for $10,110,000. The premium on this policy amounted to $37,100.

Discrimination Against Railways

A very annoying condition exists in regard to the accident insurance laws for travelers on street railways. The by-laws of many accident insurance companies and mutual accident liability associations provide for the payment of double the normal benefit to policy holders from accidents occurring when traveling on steam railroads. This discriminates against the traveler on electric roads, yet accident statistics show that about four accidents occur on steam roads to one on electric roads per thousand of passengers carried. In the opinion of many electric railway managers this clause should be changed, and the railway industry should exert sufficient pressure backed by data to overcome the inertia, largely historical, of the insurance companies in regard to the subject.

Another condition exists in some states, such as New Jersey and New York, which is detrimental to the street railways. In those states the courts will not allow the fact brought out if an insurance company has paid a benefit to the citizen bringing suit against the street railway company. The practice of railways differ also when settling accident claims of those who have and have not commercial accident insurance policies.

Use and Occupancy Insurance

An insurance company will now guarantee the service of a street railway. Fire, water, boiler explosions, turbine failures or any other catastrophe can be insured against by a type of insurance called "use and occupancy." It originated during the war where the production or the fixed charges of commercial factories were insured against breakdown. It provides in those cases for a daily indemnity paid the assured, based on the daily earning capacity of the plant. Usually a time interval of from twenty-four hours to eight days elapsed before the indemnity payments started. This insurance has developed until now service can be insured in any public utility enterprise. The rates for this kind of insurance depend largely on the arrangements for standby or reserve equipment or personnel. A 15,000-kw. turbo generator can carry a use and occupancy policy for about $3,500 to $4,000 per year, but a service guarantee on a street railway system would have a premium fixed by the local conditions.

This type of insurance is very new and may advance to the stage where a service guarantee can be carried on every motor in every street car. Use and occupancy policies are over and above all fire and accident policies already carried and involve continuity of service only.

Motor Bus Insurance

The use of the motor bus by railway operators brings into operation some new types of insurance. Fire and theft insurance at present costs $40 to $50 per bus per year. Collision insurance, which cares for damage only to the railway motor buses and not for damage to public vehicles, is written in several ways. For example, on a fourteen-seat motor bus collision insurance would cost about $340 per year. If the policy is written so that the insurance company is exempt from payments on each collision whose cost for damages is less than $50 the cost is only $102 per year. If the exemption of the insurance company is $100 per collision per bus the cost is $52 per year. The judgment of the railway executives and the specific local conditions dictate the amount of exemption warranted if any.

Property damage and public liability insurance for automobiles is very similar to older types of common carrier insurance used on railroads. It is a new development and varies in its clauses. Rates in motor bus insurance vary with the district in which the buses are operated and other conditions, but, on the average, an insurance policy which provides for $5,000 maximum for an injury to one passenger per bus and $10,000 for injuries to more than one passenger per bus might have a cost scale based on the seating capacity as follows:

Not over twelve passengers	$375 per bus per year
Not over thirteen to twenty passengers	445 per bus per year
Not over twenty-one to thirty-one passengers	570 per bus per year
Over thirty-one passengers	765 per bus per year

Some of these policies contain maximum limits of $20,000 for public liability clauses. On a fleet of buses premium credit is given for every consecutive twenty-four hours each bus is out of service during the year.

This type of insurance is more or less experimental and is usually handled by a group of associated stock companies so that each company bears a small portion of any loss that may occur. Whether this type of insurance will continue is a question. The old steam railroad common carrier insurance companies found the business unprofitable even with rates equal to 1½ to 2 per cent of the gross receipts of the carriers. A difference may result because of the type of transportation. In the motor bus each catastrophe would at most involve two buses with passengers, while in steam railroads some catastrophes, as described, would involve many coaches. Also, the liability hazard as indicated by the existing data seems to be much less with the motor bus type of transportation.

In many cases where liability indemnity bonds must be given the amount and the method are fixed by local or state laws. The insurance company writes a policy that fully covers such bond requirements, and these insurance policies are frequently accepted in lieu of bonds by civil authorities. In some cases a liability bond per passenger seat must be filed in each community in which a motor bus operates, *i.e.*, a $500 bond for each town becomes a $2,000 bond to the motor bus owner if he operates in four towns. In some cases of this type certified copies of the insurance policies, with provision for modification of policy expiration, are accepted by the communities in lieu of the bonds.

Conclusions

No attempt has been made to go into the technical details of the various insurance policies available to street railways. A brief outline of the types of insurance now available to the railway industry, combined with methods for handling insurance, may offer oppor-

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tunity for speculative thought to railway executives regarding their own insurance situation.

Fire insurance offers most opportunity for direct economies in dollars and cents and seems most to lack standardization in methods of handling and in types of policy, but on the other hand it is the type of insurance necessary to all railways.

Social insurance has very good possibilities to enhance the cordial relations between employer and employee, so requisite to the successful operation of a street railway system. These possibilities seem to be realized only slightly in the railway industry and developments are warranted along the lines of welfare insurance. It is a type of insurance, however, which must have the best executive supervision to succeed.

Motor bus insurance should prove of more and more importance in street railway transportation and should become more definite and practical as experience and data are obtained. The new types of insurance may or may not be applicable to the specific railway property, but the excess type of policy, or catastrophe policy, is a logical development in insurance that may afford safeguards to many railway properties. Insurance is not standing still, but is growing in scope and importance and even today is a major subject in the street railway curriculum.

Los Angeles Wholesale Terminal

Rival of Bush Terminal Erected in Los Angeles at Cost of $10,000,000—Served Exclusively by Pacific Electric Railway Company

BY CLIFFORD A. ELLIOTT

Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

IN THE ISSUE of the JOURNAL of July 7, 1917, the proposed plans of the Los Angeles Union Terminal Company's layout were described. Since this date the major portion of the new terminal has been completed and put into operation. This $10,000,000 wholesale terminal is located at Seventh and Central Avenues on the site formerly occupied by the Pacific Electric Railway's main car shops and car houses. These were removed from the site and new shops provided at the townsite of Torrance, while new divisional carhouses and storage tracks were provided at the Macy Street yards.

The new wholesale terminal, as completed, is considered one of the most efficiently equipped and modern plants in the United States, and is the second largest in size, the Bush Terminal being the largest.

The new terminal layout includes a produce section, in which 80 per cent of the wholesale fruit and produce business of Los Angeles is conducted, and a warehouse section which is laid out and equipped for the most economical handling of the business of wholesale, manufacturing and distributing firms.

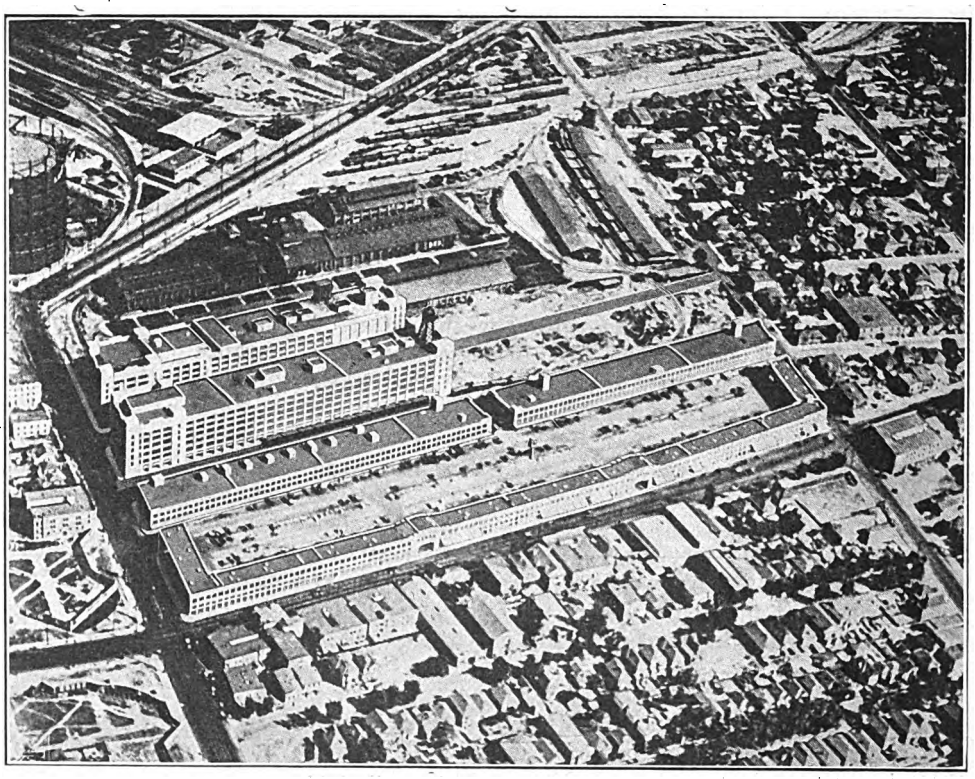
One hundred and seventy-five wholesale and manufacturing firms conduct their entire business in the terminal. For their accommodation there are located in the buildings: A bank, Western Union and Postal Telegraph offices, Standard Oil service station, box factory, 100-suite office building, forty-room hotel, two restaurants, barber shop, cigar stand, printing plant, public cold storage warehouse with 1,000,000 cu.ft. of storage space.

For the accommodation of farmers selling fresh produce and fruits there is provided a market court 1,200 ft. long by 200 ft. wide. In this court there are stalls for 500 teams and trucks.

The terminal buildings consist of three two-story produce market buildings and three seven-story warehouse and manufacturing buildings. These reinforced concrete buildings, if placed end to end, would be more than 1 mile in length and include 1,750,000 sq.ft. of floor area.

Frequent, rapid and noiseless railroad switching service is performed by the electric locomotives of the Pacific Electric Railway handling the freight cars of all railroads entering Los Angeles.

The Wurster Construction Company of Los Angeles, San Diego and St. Louis undertook and accomplished in record time the construction of this plant during the strenuous war period. Also, it handled the construction of the latest unit, seven stories in height, having 500,000 sq.ft. of floor area. This addition was completed and ready for occupancy early in 1921. This building is a Class "A" reinforced concrete structure throughout, equipped with an automatic fire sprinkling system to insure the lowest fire insurance rates, electric elevators and automatic handling equipment, spiral chutes, offices for the accommodation of factory branch representatives, sales forces, manufacturing agents and wholesale and distributing firms.



AIRPLANE VIEW OF FREIGHT TERMINAL AT LOS ANGELES OPERATED BY PACIFIC ELECTRIC RAILWAY

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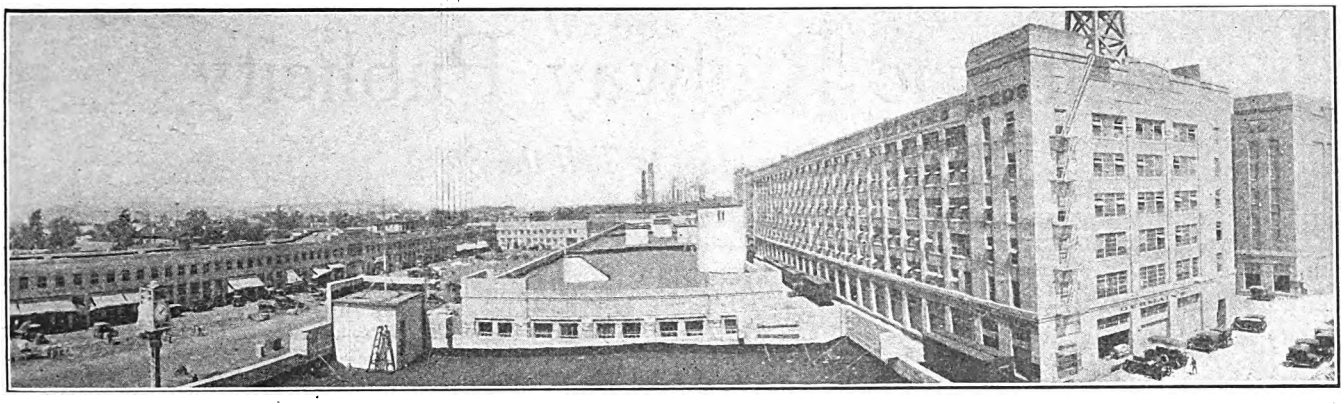

VIEW SHOWING CONSTRUCTION AND ARRANGEMENT OF BUILDINGS

The Wurster Construction Company's contracts on all the terminal buildings included not only the construction of the buildings, but the equipment of the various manufacturing plants, including the erection of the cold storage unit. This involved the use of 8,000 tons of steel, 250,000 barrels of cement, 200,000 tons of rock and sand, 10,000,000 ft. of lumber and 200,000 sq.ft. of glass and sash, also the installation of fifty hydraulic and electric elevators, thirty spiral chutes, 500,000 sq.ft. of pavement, 3 miles of spur tracks and an automatic fire sprinkler system having 25,000 sprinkler heads, gravity tanks, underground reservoirs, automatic pumping apparatus and automatic fire alarm system. The buildings are equipped with steam heating and steam power pipe lines from a central power plant, refrigeration pipe lines, gas lines, electric light and power lines in conduit throughout.

Since a larger portion of the Pacific Electric Railway's tracks serving the terminal plant are located within pavement in and about the various terminal buildings a very permanent type of track construction was followed. In certain locations about the buildings 7-in. 91-lb. T-rail and 7-in. 127-lb. grooved girder rail was laid. Tracks were rock-ballasted and asphalt pavement laid in around this type of track construction. These spur tracks, placed to serve the terminal buildings and situated in paved sections of the terminal yards, are subject to considerable use and there is a very heavy truck and team service along, over and across the spurs for reaching the various warehouses.

One of the largest operating companies at the terminal is known as the Union Terminal Warehouse Company (the largest commercial warehouse in Los Angeles, having seven warehouses with more than 1,000,000 sq.ft. of floor space, including a warehouse located at the port of Los Angeles for storage and the handling of import, export or coastwise cargo shipments). Under the service given by this company a merchant or a co-operative body of merchants can purchase a full cargo of one commodity, thus receiving the lowest possible freight rate, a quantity price on purchase and the greatest cash discount. If the merchandise is shipped draft attached, financing is arranged whereby one's banker will surrender the bill of lading to the Union Terminal Warehouse Company and accept warehouse receipts. Assuming the bank advance is 75 per cent of the value of the merchandise, the actual cash outlay will carry 400 per cent more merchandise, purchased at a lower figure. The above example applies to both carload and cargo shipments, and many wholesale merchants are now taking advantage of the savings made possible through pool or consolidated car service.

An office section is provided for the accommodation of factory branch representatives and sales forces, manufacturing agents, brokers and firms selling through spot warehouse stock.

The accompanying table shows the very small cost per case of unloading a carload of canned goods, storing it in the warehouse and reshipping it to the consumer:

COST OF UNLOADING, STORING AND RESHIPPING CARLOAD OF CANNED GOODS

Unloading, 37½ cents per ton; cost per case	1½ cents
Storage, per case per month	1 cent
Labor from warehouse door to storage floor, piling and redelivering to first floor delivery door	¾ cent
Total cost per case, including one month's storage	3 cents

Letter to the Editors

Recommended that All Traveling Expenses Be Paid

BROOKLYN RAPID TRANSIT COMPANY
BROOKLYN, N. Y., Jan. 10, 1922.

To the Editors:

In reviewing the articles published in the JOURNAL of Jan. 7, 1922, and written by the presidents of the several affiliated American electric railway associations, I would like to correct one statement as regards the payment of expense of committee members.

It is not an important item, perhaps, but I do not wish to be misquoted, as the traveling expenses of committee members should, without doubt, be paid in all cases by the American Electric Railway Association, and not as Mr. Kimball has ascribed to me by the association only when the member company or manufacturer declines to pay same.

Until such time as committees are restricted to a proper membership and distributed over such area as may seem necessary, but also restricted as a strictly business expenditure, the association will not obtain proper results nor will the expense of committees be equitably distributed. It was only a few years ago that the practice of paying such expenses was discontinued, and then because of abuse, but, of course, the correction for the abuse lies within the direction of such expenditures and can be entirely controlled by the association. It is an association expense and should not be put in the light of a contribution by interested parties at any time.

W. G. GOVE,
Superintendent of Equipment
for Lindley M. Garrison, Receiver.

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Electric Railway Publicity

Devoted to How to Tell the Story

All Aboard for "White Mule"

Safety First Car in East St. Louis Makes Debut Amid Great Publicity—Results Significant

THE East St. Louis & Suburban Railway, East St. Louis, Ill., has placed a "Safety First" street car in regular service, bearing more than fifty signs inside and out, and the crews are giving out thousands of pamphlets entitled "A Safe Journey." D. E. Parsons, general manager, who fathered the idea, makes the following statement:

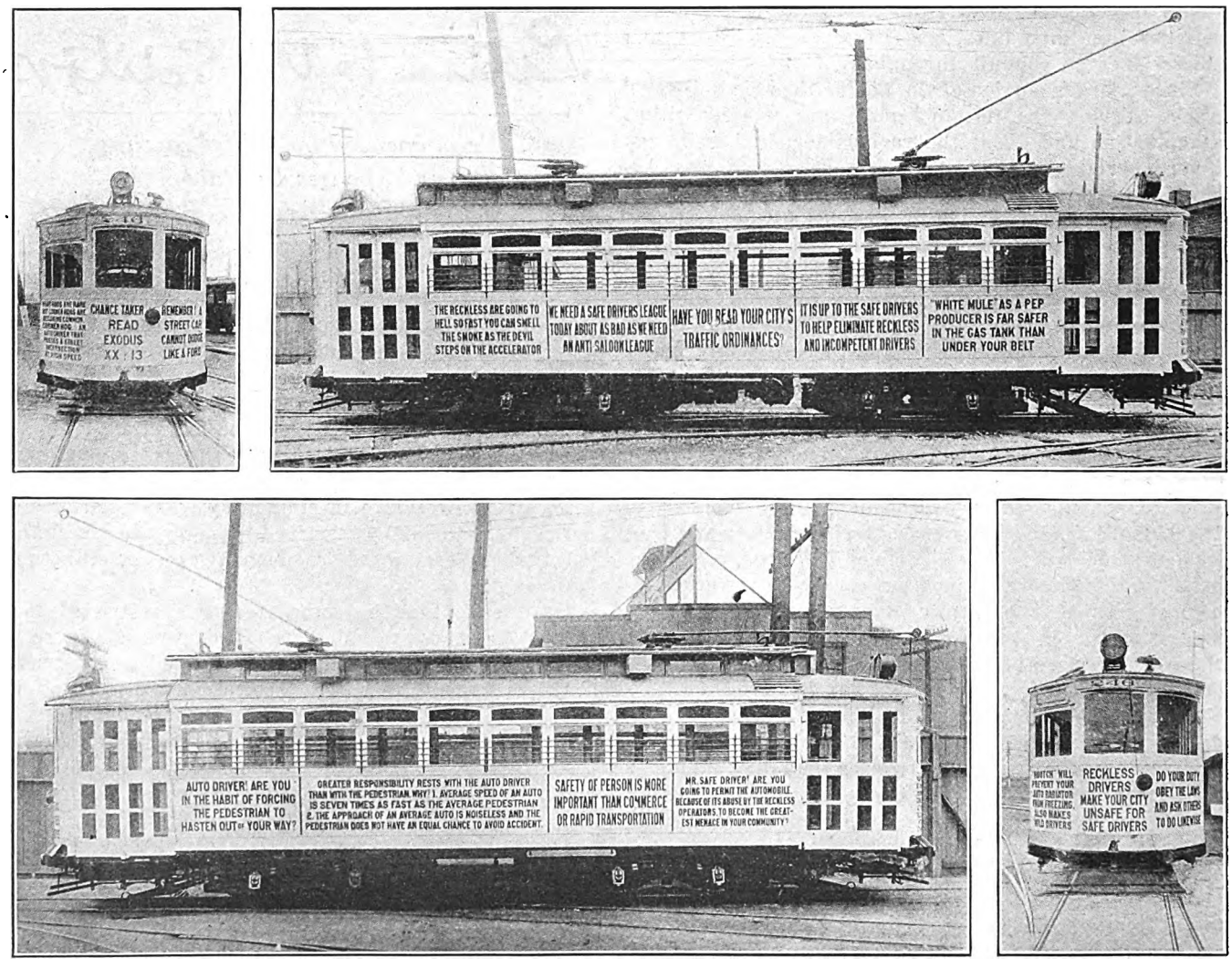
This car is one of our standard type city cars so far as the body is concerned, but the trucks are equipped with four motors suitable for interurban transportation. The car is painted with three coats of the best white enamel and the lettering is in black. All of the work was done in our own shops. The advertising racks inside of the car contain cards with slogans to the pedestrians and car riders. There are twenty-eight such cards in the car.

It has been my aim in preparing the slogans for this car, both inside and outside, to appeal to the safe driver, pedestrian or car rider to co-operate to avoid accidents and to help control the actions, if possible, of the reckless person. The car has been in service for five days and I have received no adverse criticism as to the wording of the slogans, but I have received a great deal of constructive praise. During the days this car has been in service we have not received a single "flash" report of a collision between an automobile and a street car. In the past we have had a large number of such accidents, but the period is too short to determine whether we shall not have them as usual. So far results are rather significant.

This car will be operated in regular service on the different divisions in the city of East St. Louis for about three months and then will be operated on the interurban lines. Besides the signs, four holders have been placed on the inside of the car, with the lettering "Take One," and these holders contain pamphlets. Our car has been named the White Mule.

On the front of the car these admonitions strike the eye:

Hootch will prevent your auto radiator from freezing; it also makes wild drivers. The reckless are going to hell so fast you can see the fire fly as the devil steps on the accelerator. We need a safe drivers' league today as badly as we need an anti-saloon league. Remember, a street car



AN IRRESISTIBLE PLEA OF THE RAILWAY FOR SAFETY

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Please Examine Your Transfers

Make sure that they are properly punched before leaving a car.

Practically all transfer errors can be eliminated if the car riders will co-operate. See that you get the transfer you ask for. If it is not correctly punched, return it to conductor, call his attention to the error, and ask him to issue a new transfer.

We ask your co-operation.

To Our Patrons:

We want your opinion of the street car service now being given in East St. Louis.

We need your help to make it better.

Your suggestions are welcomed; your criticisms will give us an opportunity of making corrections when they are well founded.

In its last analysis, street car service is a matter of co-operation, and the extent of co-operation given will be reflected in the service.

TYPICAL EAST ST. LOUIS & SUBURBAN SIGNS

cannot dodge like a Ford. Chance takers, read Exodus xx, 13. A corner hog is a driver who passes a street car intersection at high speed.

Among the more striking signs is one reading:

More responsibility rests with the auto driver than with the pedestrian because (1) the automobile travels seven times as fast as the pedestrian, and (2) the approach of the average automobile is noiseless and the pedestrian does not have an equal chance to avoid accident.

Inside the car there are further admonitions in the regular advertising car space, some cryptic, some funny and one a cipher. The latter has a bunch of scrambled letters. Close inspection will show they are numbered, and placing them together the reader will discover the legend: "Don't be a Jay Walker." Others are:

Safety of people is more important than commerce or rapid transportation.

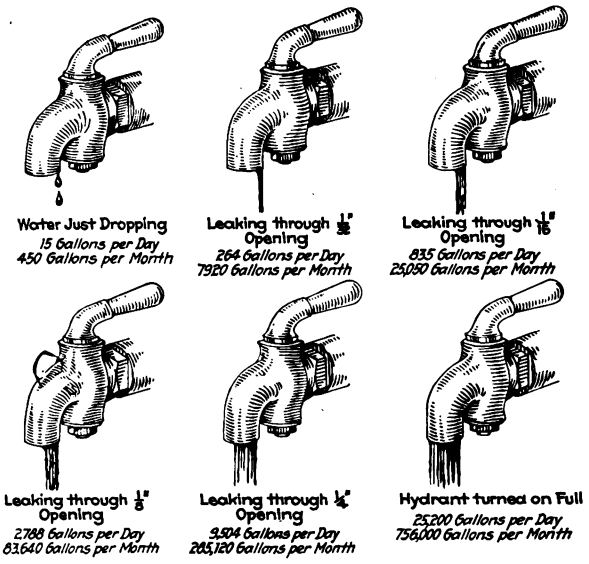
Do your duty, obey the law and ask others to do likewise.

Did you know that in 1920, 841 autoists were arrested for passing a street car?

Do your shopping between 9 and 4 o'clock and give the workers who have to ride later a chance to get a seat.

Signs Help Water Conservation Campaign

THE Pacific Electric Railway owns and operates, in connection with its extensive interurban mileage in southern California, several parks and seaside resorts. One of these is the Mount Lowe resort, a mile above the sea, which is reached after a scenic ride up the mountain. During the dry season strict attention must be devoted to the conservation of the water supply



SIGNS PLACED IN PARKS OF PACIFIC ELECTRIC RAILWAY TO ENCOURAGE THE SAVING OF WATER

taken from the various mountain sources for use not only in these resorts but as a means of protection against fire.

A campaign was instituted to appeal to the employees of the company as well as to its guests and patrons to conserve water. A feature of this compaign was the posting in conspicuous places, where water was available, of signs similar to the one here shown to impress people with the magnitude of the waste possible even though the water drips but slowly from a leaky faucet.

The Little Rock Company Told Its Story to the Public This Way

The Electric Car a Public Blessing

It is more or less customary to "bawl out" the street car management when one has to wait for a car because a wagon has broken down on the track perhaps, but after all what a source of pleasure, at small cost, is the street car. It not only provides the means for toilers to live away from the heat and noise of the city, but it gives great opportunities for taking the air and seeing the suburbs. Look at the Sunday evening crowds to hear the music at Forest Park. Most of them are cooped up all week in offices and factories, with lungs starved for a breath of fresh air. See the little ones, any day in the week, playing on the grass at the park, putting oxygen into their lungs and red blood in their veins—and all for a nickel.

When you feel like "bawling out" the management for something probably not the fault of the company, remember the good things it achieves.

Little Rock Railway & Electric Co.

Americans Proceed At High Pressure

"Push" is distinctively an American quality and it is a very commendable quality, provided it is not carried to excess. But there is a limit to this thing of rushing through life. It is never worth while to risk life to save seconds or minutes. But it is this craze for haste which is responsible for the majority of auto accidents. The auto gets one about fast enough, but to save a second or two of time, there are drivers who persistently cut corners or who take a chance in heading off a car at a crossing, or exceed the speed limit, even on streets on which they have not the right of way, and in many other ways foolishly, often recklessly, ignore the traffic rules made in the interest of public safety.

Little Rock Railway & Electric Company

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Improving Operation*

Various Ways Are Described by Which Surface Car Operation Can Be Improved to the Benefit of Company and Public

BY EDWARD A. ROBERTS
Of the Beeler Organization, New York

THE subject of improving surface car operation offers two methods of approach; one has for its primary object the saving of operating expense; the other is concerned first with the giving of better service. It should be understood, however, that these two are by no means incompatible.

One of the best places to start on a campaign for reducing operating expenses is probably the time-table department. In this department originates whatever lost motion there is in the operation of the cars on the street. This lost motion may be the result of slow running time, irregular headways, wasteful arrangement of the men's working hours, sending out cars too early, keeping them out too late, long layovers at the ends of the routes and other such items.

The matter of layovers may, to the average person, appear to be comparatively unimportant, yet the per cent of the total time that cars spend standing at the end of their routes varies from 2 per cent in some cases to 25 per cent in others; that is, from one minute to twelve and one-half minutes on a fifty-minute run. On a typical line earning 40 cents per car-mile and operating at 9.3 m.p.h., and having a 2 per cent layover, the car-hour earnings would be $3.65. But if the layover was 25 per cent the earnings would be only $2.79 per hour. After taking out the crew's wages of $1.10 per hour, the remainder would be $2.55 in one case and $1.69 in the other. This is a tremendous difference caused by just one item in the operation of the company. It is important enough to mean success or failure.

Routing of cars, and particularly turnback service, is a subject that requires constant study. American cities big enough to support street railway systems are constantly growing and changing. Factories are being constructed in undeveloped sections; the residential districts are gradually changing their characteristics. The result is that to keep up with these changes routing of the street car lines must be revised at frequent intervals, or wasted service will ensue. Yet in many cities the routing is practically the same today as it was ten or more years ago.

The economical use of power by the motormen is a phase of operation that has big possibilities. The use of measuring devices stirs up competition and encourages the men to use the minimum amount of power to take them over their routes. With such an incentive, the consumption may be reduced 15 to 25 per cent, representing a very considerable part of the operating expense.

In the equipment department there are opportunities for better service and cheaper service. The safety car comes to mind immediately in connection with modern street railway equipment. It is a familiar sight now in many cities, a lightweight car with a number of safety features and so arranged that it can be operated by one man. An important feature is that this car has materially higher acceleration than the ordinary street car, which enables it to make higher schedule speed. There are about 6,000 safety cars in use today throughout the country and they have met with the greatest success when applied so as to give a more frequent and faster service than the cars they replaced. Gross receipts have gone up, expenses have come down and the operators have received an increased rate of pay.

The success of the safety car leads us into another phase of this subject of improved service, namely, frequent headways. More people will ride if more service is given. Here are some figures of an interesting experiment made in a Western city on a route running from the railroad station across the center of the city. On the original eight-minute headway each car on the line averaged $21 per day in receipts. On a five minute headway this amount was increased to $25 per car per day. They decreased the interval between cars to four minutes and the receipts went to $29 per car per day, and on a three-minute headway they again went up, to $35. Finally the service was established on a 2½-minute basis and the daily receipts per car were $40. All this developed in less than a year.

Regularity of the service has a similar effect on the revenue. When a line has frequent delays and cars come in bunches at infrequent intervals instead of regularly, the patrons lose faith in their car service. This breaking of faith by not maintaining regular service is probably the chief cause for the popularity of destructive jitney competition where it exists.

Transportation salesmanship is a popular phrase in the street railway industry just now. There are numerous ways of selling street car rides. The best channel is through the men on the cars, for they make the sales. We learned during the recent milk strike that the men who drove the milk trucks were "route salesmen," not truck drivers, and that they received in addition to their wages a small commission on their collections of bills. Doesn't that title "route salesman" rightfully belong to the man whose business it is to sell transportation on a street car route?

The loading platform is a humble contraption that pleases the public and has a marked effect on the time required to load and unload passengers. It is an isle of safety placed in the street alongside the car tracks, where prospective passengers can assemble. The time-saving feature is that when the passenger steps up on the platform he has taken his first step into the car, and it takes him a fraction of a second less to board the car when it comes. This convenience in boarding the streeet car matches one of the chief advantages of the motor bus, curb loading.

The so-called skip-stop possesses great possibilities in speeding up the service. The term is really a misnomer; to the public of some cities a disagreeable sounding catch phrase. A better description would be "proper spacing of stops." Street car speed depends on the number of stops, of course, and the fewer the stops the faster the speed. To illustrate, if a car that can travel 20 m.p.h. without making any stops should make eight stops in a mile, each five seconds in duration, its speed would be reduced to 10 m.p.h. If it made twelve stops per mile, which is probably an average for Manhattan, the speed would be reduced to 7 m.p.h. Eight stops per mile means that the car starts and stops every forty-five seconds. An increase of 10 to 20 per cent in the number of car-miles from each car hour has been made by spacing out the stops.

There is almost an infinite number of other points that affect good surface car operation, and the number and variety of things that can be done are really limited only by the ingenuity of the management. Just to mention a few, there are prepayment areas at heavy loading points, two-car trains, telephone dispatching of cars from terminal points, electric switches, location of stops at junction points, modern methods of fare collecting and registration, co-operation with the traffic police to speed up intersection movements and the use of large legible signs on the cars.

After our street railway companies have acted on all these matters and sought to attain perfection in them, the results will completely disprove the opinion held in many quarters today that the street railway industry has outlived its usefulness.

*Abstract of a discussion led by Mr. Roberts at the monthly meeting of department heads of the New York Transit Commission on Dec. 19, 1921.

Standardization of Ties

THE American Railway Engineering Association and the United States Forest Service have been designated by the American Engineering Standards Committee as joint sponsors for the unification of specifications for wood cross ties and switch ties for all classes of use. The work is to include the grouping of ties with regard to inspection rules and preservative treatment, but not methods of treatment. This action is in accordance with the recommendations of a conference on railroad ties, to which the American Electric Railway Association and other interested organizations had designated representatives.

C. E. R. A. Program Announced

Numerous Papers on Mechanical Subjects Will Be Presented at Two-Day Session

SECRETARY L. E. EARLYWINE has given out the following program for the annual meeting of the Central Electric Railway Association to be held at the Lincoln Hotel, Indianapoils, Ind., Jan. 26-27.

PROGRAM

THURSDAY *Jan. 26—9 a.m.*

1. Meeting of executive committee.

Morning Session, 10 a.m.

2. Annual address of president by A. C. Blinn, vice-president and general manager, Northern Ohio Traction & Light Company, Akron, Ohio.
3. Business session and reports of committees.
4. Paper, "Light-Weight Cars for Interurban Service" by P. V. C. See, superintendent of equipment Northern Ohio Traction & Light Company, Akron, Ohio.

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Afternoon Session, 2 p.m.

5. Report of Engineering Council by G. T. Seely, chairman, president Youngstown Municipal Railway, Youngstown, Ohio.
6. Paper, "Building Up Worn Flanges on Rolled Steel Wheels by Welding," by E. B. Gunn, superintendent of transportation, Western Ohio Railways, Wapakoneta, Ohio, and Charles Sigler, master mechanic, Winona Interurban Railway, Warsaw, Ind.
7. Discussion by R. C. Taylor, superintendent of equipment, Michigan Railroad Company, Albion, Mich.
8. Paper, "Relative Merits of Sliding Contact Shoes as Compared with Standard Trolley Wheels," by H. Savage, master mechanic, Detroit (Mich.) United Railway and C. C. Argabrite, electrical engineer, Interstate Public Service Company, Indianapolis, Ind.
9. Discussion by J. W. Osborn, superintendent of equipment, Terre Haute, Indianapolis & Eastern Traction Company, Lebanon, Ind.
   J. F. Edward, master mechanic, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.
10. Paper, "Reclaiming Track in Paved Street," by T. H. David, principal assistant engineer, Indianapolis (Ind.) Street Railway and L. A. Mitchell, engineer maintenance of way, Union Traction Company of Indiana, Anderson, Ind.
11. Discussion by
    M. Ackerman, general manager, Cincinnati & Dayton Traction Company, Dayton, Ohio.
    R. J. Custer, engineer way and structures, Interstate Public Service Company, Columbus, Ind.
    H. V. Norford, superintendent maintenance of way, Indiana Service Corporation, Fort Wayne, Ind.

Annual Dinner 6 p.m.—Dancing 8 to 11

FRIDAY, *Jan. 27—9 a.m.*

12. Paper, "Pick Up and Delivery Service," by M. Ackerman, general manager, Cincinnati & Dayton Traction Company, Dayton, Ohio.
13. Papers, "Organization and Sales Force" and "Tried and Proved Sales and Publicity Methods," by Labert St. Clair, Bureau of Information and Service, American Electric Railway Association, New York.

American Association News

Membership List Issued

A LIST of the member railway companies, of member manufacturer companies and of associate member companies, as of date Jan. 1, 1922, has just been issued by the association headquarters.

This list is issued as a part of the program of the committee on company and associate membership of the association. With a geographical arrangement of the member companies, it is easy to ascertain what companies in a given area are non-members and therefore subject to solicitation.

The committee is also urging all member companies to use the association membership emblem on stationery and advertising.

Important Educational Work Under Way

SUPPLEMENTING the preliminary note regarding the meeting of the American Association committee on education, which were printed in the Jan. 7 issue, the following items complete the story:

At the meeting, which was held on Jan. 3 the committee first considered the scope of the subject assigned, as well as the evident intent of the executive committee in outlining the field of the committee's endeavors.

The vote of the executive committee creating this committee was as follows:

That the executive committee create a special committee which may grow into a continuing or standing committee for co-operation with educational institutions of the country with a view of bringing before the engineering schools the necessity for more new blood in the transportation business and the opportunities existing there; also to encourage, where possible, courses in electric railways and public utilities; also to arrange where possible co-operation between individual railways and engineering schools with a view to placing engineering students in summer time and after graduation.

It was the understanding of the committee that its work should cover the forms of education and training necessary to develop competent officers from within its own ranks, as well as to arrange through co-operation with educational institutions for the training and placing of technical trained men to meet the requirements of the industry.

After reviewing communications received from several sources, showing great interest in the subject, the committee decided as follows:

1. That each member of the committee write a short thesis outlining his views upon approaching the study of this highly important subject, in order that these may be published for the purpose of awakening the thought of the industry to the problem and the work which the committee has undertaken.
2. That the committee be provided with copies of all papers at present in the chairman's files.
3. That W. H. Timbie and F. R. Phillips prepare statements as to what is being done along educational lines in their respective localities, and that each member of the committee be provided with copies of these for use in ascertaining from their localities the attitude of educational institutions, and the amount of co-operation and desire to assist which exists on their part.
4. That H. H. Norris, W. H. Timbie, C. S. Coler and F. R. Phillips try to secure information as to what other industries are doing along educational lines and send this to each member of the committee.
5. That a letter be sent to member companies outlining the committee's plans, with a request for comments or suggestions as to pertinent methods of successfully attacking its problem.*

Mr. Phillips presented the question of apprenticeship systems as reported on by the committee on that subject in the Engineering Association last year, and suggested that in view of the scope of the educational committee, the function of the Engineering Association committee on apprenticeship system might be taken over by the former. In view of this, the committee also suggested that the Engineering Association forward to the educational committee any recommendations which it may have with respect to the method of handling trade apprenticeship courses.

The committee tentatively decided to meet in New York City at association headquarters about the middle of April.

*This letter went out from the office of Executive Secretary Welsh on Jan. 9.

Equipment Committee Starts Work

THE Equipment Committee of the Engineering Association held its first meeting of the year at Association headquarters in New York City on Jan. 10. Those present were R. H. Dalgleish, Capital Traction Company, Washington, D. C., chairman; W. S. Adams, The J. G. Brill Company, Philadelphia, Pa.; H. A. Benedict, Public Service Railway, Newark, N. J.; L. J. Davis, Brooklyn City Railroad; J. L. Gould, Wilmington & Philadelphia Traction Company; Stuart Hazelwood, Midvale Steel & Ordnance Company; J. M. Hipple, Westinghouse Electric & Manufacturing Company; Robert Long, Altoona & Logan Valley Railway; A. J. Miller, Association of Manufacturers of Chilled Car Wheels; M. O'Brien, United Railways Company of St. Louis; E. D. Priest, General Electric Company; P. V. C. See, Northern Ohio Traction & Light Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL. R. W. Steigerwalt represented C. F. W. Rys, of the Carnegie Steel Company.

The nine subjects assigned to this year's committee for consideration and report were taken up and discussed, and plans were outlined for handling the work. Sub-committees were appointed on the various subjects and in order to minimize the number of these committees, subjects 1, 1A and 5 were combined and assigned to one committee. The work was divided among the committees as follows the name given first being that of the chairman of the sub-committee.

Subjects 1, 1A and 5 relating to the contours of wheels — Messrs. Daus, Adams, Benedict, Gould, Hazelwood, Miller, Rys and See. Subject 2, helical gears; Messrs. O'Brien, Gould, Hipple and Priest. Subject 3, lightning protection; Messrs. See, Hipple, Long and Priest. Subject 4, shop building; Messrs. Long, Gould and Squier. Subject 6, trolley contact devices; Messrs. Davis, Hipple, O'Brien and Priest. Subject 7, wires and cables; Messrs. Davis, Dalgleish, Hipple and Priest. Subject 8, National Electrical Safety Code; Messrs. Gould, Long and Squier. Subject 9, revision of standards and specifications; Messrs. Benedict, Adams, Hazelwood, O'Brien, Rys and See.

In the discussion, it developed that there were several other subjects which might prove of interest for an investigation by the Equipment Committee and the chairman will communicate with the executive committee of the Engineering Association in regard to further following up this work.

Merchandising Transportation

THE committee on this subject of the Transportation & Traffic Association met in New York, Jan. 9. Those in attendance were E. M. Walker, chairman, Terre Haute; K. A. Simmon, East Pittsburgh; F. W. Shappert, Chicago; Samuel Riddle, Louisville; V. S. Curtis, New Haven; W. H. Boyce, New Brighton, and J. B. Stewart, Jr., Youngstown. Among the topics discussed were weekly and monthly passes, newspaper advertising, direct solicitation of group passenger business, freight, education of employees, suggestions from them, different methods of fare collection, etc. It is proposed to hold the next meeting in Indianapolis on March 1.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Co-operation a Fact in Louisville

President Barnes Putting Into Full Effect His Ideas of Employee Participation in Management

James P. Barnes, president of the Louisville (Ky.) Railway, since the fall of 1920, has been unusually successful in restoring that company to public confidence and in rebuilding the personnel, disrupted by a strike just before he took hold. When Mr. Barnes entered upon his duties there was a 5-cent fare in Louisville and efforts to secure an increase were blocked on every side. In the spring of 1921, however, the company under Federal injunction began collecting a 7-cent fare. The case has been as far as the Supreme Court, but is back before the Federal Court of Appeals.

Wins Employees' Support

Mr. Barnes has not merely been building up public sympathy, and getting the company back into shape, but has secured a degree of loyalty and co-operation from the employees that leaves little to be desired. A few weeks ago the officers of the company conferred with the employees, over the matter of the need for a wage cut, and the result was that the men were big enough and broad enough to decide the issue intelligently by accepting the wage reduction. There was no ill feeling. The negotiations were conducted by the company with the employees through the Co-Operative Welfare Association. How well organized this body is can be figured from the fact that of twenty-three divisions, or local units, twelve boast of 100 per cent membership in the welfare association, and of the ten carhouses, seven are registering a 100 per cent membership.

Employee to Become Director

Just recently President Barnes at a dinner of employees of two carhouses, given by the company to the men who had led a contest for fewer accidents, announced that a worker from the ranks was to be placed on the board of directors of the company. The election of the employee-director will take place on the second Wednesday in February, a week previous to the annual meeting of the stockholders. Each member of the Welfare Association will have one vote coming in electing the director. There are six general committeemen, and all are eligible for election. At the last meeting on Dec. 20, the committeemen drew positions on the ballot. The men and departments they represent as they appear on the ballot follow:

J. E. Burdon, Motive Power.
Chester Diersing, Clerks.
George Broekers, Shops or Maintenance.
Damon L. Kehl, Maintenance of Way.
John Peters, City Motormen and Conductors.
Gus Schmidtt, Interurban Motormen and Conductors.

All units will vote upon their choice for the directorate upon the same day. In order to vote in the election the men have been joining the Co-Operative Welfare Association in numbers as there is a membership campaign on, and again there is a bit of electioneering on the part of the men. More than 90 per cent of the employees now belong to the organization.

Of course the motormen and conductors are in the majority, there being approximately 1,000 trainmen as compared with about 800 in all other departments. However, some of the inspectors and men in other departments have been with the company many years, and are decidedly popular, with the result that there is no reason why it should be a runaway race for the trainmen.

Under date of Jan 1, the company got out a letter containing a thought for company men, which has been placed on the bulletin boards, etc., and which is intended to get the entire organization to treat all other employees and the public generally with courtesy. The letter read:

Here is a thought for 1922.

The biggest asset a company can have is the good will of the public. This good will is won by ready, willing service, and above all, courteous service. Courtesy is the oil which eliminates friction between company and public, as well as within our organization.

"Let's Go"—This year in a renewed and intensified courtesy drive on the Louisville Railway properties. Treat everyone coming into your office, or meeting you in the course of your work, regardless of time, circumstances or provocation, with courtesy, and always more courtesy.

I pledge you that this shall be the rule in my office, throughout 1922, and ask that you join me, so that our attitude shall be reflected in and through those with whom we come in daily contact, and the Louisville Railway enjoy the reputation, not only of the most courteous concern in Louisville, but the most courteous street railway in the country.

Yours for happiness and prosperity in the new year.

The Louisville newspapers commented freely on this announcement.

Operation Will Be Resumed in Manistee

The Worth Transportation and Products Company has been granted the right to operate cars in Manistee, Mich. The company has agreed to charge 5-cent fares. The street cars here have been idle for several weeks since the old company quit business after announcing that it was unable to make expenses. References have been made previously in the Electric Railway Journal to the Manistee suspension.

The Worth company proposes to equip and operate a line with not less than eight cars that will have a speed up to 30 miles an hour as conditions warrant. Service inside the city limits will be one car each way every five minutes.

Ever since the experiments were conducted on the Manistee track by a special motor vehicle manufactured by the Worth company, the proposition of utilizing the tracks by a less expensively operated motor car has been discussed and pushed.

The company is considering the extension of its lines to suburban points not now reached by the tracks.

Municipal Ownership Rejected

Change in Public Sentiment Reflected in Vote on Franchise Question in Ottawa

On Jan. 3 the electors of Ottawa, Canada, passed judgment on three proposals laid before them for the settlement of the Ottawa Electric Railway question. These were municipal ownership, extension of the present franchise and service at cost.

The vote, as was given in the Electric Railway Journal for Jan. 7, stood as follows:

Municipal ownership:	
Yes	6,003
No	8,430
Extension of the franchise:	
Yes	8,415
No	6,070
Service-at-cost:	
Yes	3,345
No	10,639

Although the company's proposal of service-at-cost was decisively negatived, the defeat of municipal ownership was complete, and the confidence shown in the present management by the large majority for the extension of the franchise is regarded as a testimony to the fair way in which the electric railway has presented the facts of the case during the last two years.

Surprising Reversal on Municipal Ownership

This is evidenced by the surprising reversal of the municipal ownership vote taken three years ago, before the company had done any work in the way of publicity. In 1919 the vote on a proposal to purchase the Ottawa Electric Railway in 1923 stood:

For the purchase	8,770
Against the purchase	2,309

Last year the question came before the property owners alone, on a by-law to purchase the road. The result was:

For the purchase	2,326
Against the purchase	4,438

By comparison of these figures with the vote this year it will be seen that not only the property owners but also the other electors are now opposed to city ownership and operation.

Contest Narrows Down

The vote on service at cost is not, perhaps, a fair indication of the opinion of the electors on this phase of the question, as the contest narrowed down, as so often happens in three-cornered contests, very largely to two of the three proposals. The company's frank statement, that it will consider a renewal of its franchise only on terms involving a readjustment of fares whenever economic conditions demand such, enabled those who approved the service-at-cost plan to vote also for the franchise extension.

The educational campaign carried on in connection with service at cost has, therefore, borne good fruit in helping the electors to reach a sane decision on the merits of public as compared with private operation.

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Leasing Plan Causes Split

Detroit Committee Must Confer with Full Board on Purchase Offer —City Relies on Ouster

The city and the Detroit United Railway have split on the leasing plan proposed by Mayor James Couzens. The break resulted from the Mayor's ultimatum to the company to sell its system to the city at a reasonable price or remove its tracks from Fort Street and Woodward Avenue as provided for in the ouster ordinance passed at the November election last year. This is the first hitch in the otherwise harmonious negotiations which have resulted in joint operation over some of the company's urban lines.

No Day-to-Day Leasing

The company representatives at the conference on Jan. 6 refused to consider the leasing of the entire urban system to the city on a day-to-day basis pending the placing of a purchase plan on the ballot for approval by the voters. The company officials intimated that the company could not consent to a day-to-day rental since its financial condition would not permit such action.

Whether or not the joint operation of company and city cars over certain lines will be affected depends somewhat upon later developments. The agreements reached in previous conferences provide for joint operation on the Trumbull, Hamilton, Woodward, Fourteenth, Fort and Grand Belt lines. The Trumbull cars have been running jointly for about three weeks, and city cars were also started operating jointly on the Hamilton and Woodward lines with the beginning of the new year. The city pays the company at a specified rate of 20 cents per car-mile for the privilege of operating cars over company tracks. The Grand Belt line, taken over by the city under the day-to-day agreement, at an arbitrated price, is being operated by the company, the company paying the city on the same basis.

The representatives at the conference who acted for the company were Allan F. Edwards, vice-president; Alex Dow, Jere C. Hutchins and W. F. Moore, directors; E. J. Burdick, general manager; Elliott G. Stevenson, attorney. The Mayor, members of the Street Railway Commission, Corporation Counsel Wilcox, Joseph S. Goodwin, general manager of the municipal system and Ross Schram, assistant general manager, represented the city.

Entire D. U. R. Board to Meet

While no statement was made by the company following the conference a statement issued by Mayor Couzens gave the following details:

The meeting of the board of street railway commissioners and the directors' committee of the Detroit United Railway developed the surprising fact that the Detroit United Railway committee present was without full power to act, as had been represented in previous conferences with the same committee.

The committee stated that the Detroit United Railway could not enter into a day-to-day rental agreement for the entire city system now, or at any other time in the future. This was due, the members stated, to the financial condition which will not permit the company to rent the lines under a day-to-day agreement and still take care of its current obligations on the transfer of the system to the city.

The members of the Detroit United Railway committee declared that it would be necessary to confer with the full board of directors on the question of the sale of the system to the city and that until the board of directors itself passed on that question the committee had no power to further discuss the matter.

In the meantime a call has been made for a meeting of the entire Detroit United Railway board of directors, following which the entire board plans to meet with the Mayor and board of street railway commissioners.

The city states that unless the board of directors, at its meeting with the street railway commission, comes prepared to agree to a price satisfactory to the city, the negotiations will be terminated and the city will proceed to enforce the provisions of the ouster ordinance on Woodward Avenue and Fort Street.

Until the day when the proposal to lease was refused, no intimation had been given of the desire of the Detroit United Railway to withdraw from the proposition to rent the entire system to the city on a day-to-day basis.

No attempt was made to carry out the ouster ordinance after its passage. In fact the ordinance has not been considered as a factor in the negotiations relative to joint operation of cars since both parties agreed that no existing rights would be gained or lost by either party as a result of the negotiations. The city's offer of $388,000 for the Fort Street and Woodward Avenue lines of the company still stands and the ouster ordinance is held as a sort of club by the Mayor. If the ouster ordinance is enforced and the company removes its tracks, it is understood that the street railway commission plans to take care of traffic on the streets affected by means of buses to be operated while the old tracks are being torn up and new ones relaid by the city.

Democrats Seek to Undo Utility Legislation

The Democratic minority has introduced in the Senate and Assembly of New York two measures calculated to rip to pieces the public service commissions law as enacted last winter. One of the measures would abolish the transit commission in Greater New York and establish municipal public service commissions in each of the first and second class cities of the State. This means that all cities of 50,000 population or more would have a public service commission of its own to regulate and control all public utilities within its boundaries, leaving to the public service commission of the state the control over public utilities outside their boundaries.

The other and companion measure would establish in the city of New York, by an amendment to the Greater New York charter, a department of transportation to take the place of the transit commission so abolished. There might be some merit in this measure, if the Legislature really wanted to grant to New York city complete self-government in public utility matters.

Assemblyman Dickstein has introduced a measure, which has been before the Legislature for some years back, to compel the transit corporations in Greater New York to do away with all wooden cars within one year. The transit commission is given power to issue the necessary orders to bring this about.

This measure has the backing of the New York *World*. It apparently has little chance of passage.

126,321,809 More Passengers

Report of New York Commission Stresses Need for Additional Transit Routes

The failure of the Board of Estimate of New York City to make the appropriations necessary to complete the rapid transit lines provided for in the dual contracts, is featured in the annual report of the Transit Commission just presented to the Legislature. Contracts to the amount of $4,710,427 have been forwarded by the commission to the board. Five contracts for small jobs, representing an expenditure of $255,240 were approved.

The most important of the contracts remaining with the Board of Estimate is for the construction and extension of the Queensboro subway from its present terminus at the Grand Central Terminal through Forty-second and Forty-first Streets to Eighth Avenue. This contract, which was awarded to the Powers-Kennedy Contracting Corportion, the lowest bidder, for $3,867,-138, reached the board on Nov. 22 last, with a request that the necessary appropriation be made. The matter was referred to a committee, where it still lies, along with about twoscore others, varying in importance. Indications are plentiful that the friction caused by the refusal of the board to approve the contracts will shortly create a situation that will focus public attention upon the matter.

Traffic Figures in Detail

The report shows that the increase in traffic on the various lines for the year ended June 30, 1921, was 126,321,809; that traffic increased on the Interborough lines 58,545,721 and on the Brooklyn Rapid Transit 28,188,095. The largest single increase, 53,287,147, was on the subway lines of the Interborough. There was a falling off of 14,829,624 on the surface lines in Brooklyn, and an increase of 13,533,516 on the Third Avenue Railway system in the Bronx. The falling off in surface line traffic in Brooklyn was caused, the report states, by the opening of the new subway lines.

The city, according to the report, has already invested nearly $300,000,000 in subway construction. The commission is to lay out new lines to cost $250,000,-000, one-fifth of the amount to be spent every year during a five-year period. At the end of the last year there were under the jurisdiction of the commission fifty-eight street and electric railways, eleven steam railroads and two stage coach corporations. The combined net capitalization of these companies was $1,280,622,177, an increase of about $59,000,000 over 1920. The growth in traffic for the three years from 1919 to 1921 inclusive is shown herewith:

	1919	1920	1921
I. R. T. Sub.	461,147,058	586,098,633	639,385,780
Elevated....	348,188,600	369,034,477	374,293,051
B. R. T.....	305,021,402	376,782,635	404,970,640
Hud. Tubes.	86,050,815	92,250,836	95,607,645
Surface Lines:			
Manhattan..	370,084,711	349,772,761	384,128,024
Bronx.....	80,806,261	94,141,991	107,675,507
Brooklyn....	365,963,677	432,936,227	418,106,603
Queens.....	46,723,575	49,562,574	51,944,034
Richmond...	15,958,198	15,007,235	15,797,894

Despite the increase in traffic the financial condition of the companies did not improve during the year. The report states:

There was a large increase in the deficit. This deficit for the year ended June 30, 1920, was $10,725,522, while for the year ended June 30, 1921, it was $16,835,756.

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Resolution Introduced Advocating Purchase by City

Councilman Morton at Richmond, Va., recently presented a resolution instructing the Director of Public Utilities and the Director of Public Works, together with the streets committee, to investigate and report upon the feasibility and advisability of the purchase and operation by the city of the railway lines of the Virginia Railway & Power Company within the city. The proposal was referred to the streets committee, which now has under consideration a number of measures designed to improve railway service in Richmond.

Councilman James E. Dickerson has presented a resolution repealing the ordinance permitting the company to charge a flat 6-cent fare in lieu of the requirements of the franchise, which provide for a flat 5-cent fare, or six tickets for 25 cents; a labor ticket at 2½ cents and a school ticket. This resolution has also been referred to the streets committee.

The streets committee will hear further from experts on the proposed valuation of the company's holdings in Richmond. In the meantime, the ordinance committee is holding in abeyance all jitney-regulation matters, until the present differences between the company and the employees over the proposed wage cut are settled.

Municipalities Favor Purchase

The ratepayers of Toronto, Canada, have voted in favor of the purchase by the city of the Toronto Suburban and the Toronto Eastern railway lines as part of a scheme to connect that city up with a system of municipally owned hydro-radials to be operated by the Ontario Hydro-Electric Commission. On the same day the following municipalities voted in favor of the purchase of the Toronto, Niagara & St. Catharines Railway, for the same purpose: St. Catharines, Niagara-on-the-Lake, Merriton, Thorold, Port Dalhousie, Louth township and Port Colborne. The village of Humberston alone voted nay. The Ontario government is opposed to publicly owned hydro-radials and warned Sir Adam Beck, chairman of the commission, that it would not guarantee the bonds for the enterprise, a special commission, appointed by Premier Drury, having, after investigation, declared that the scheme would not pay.

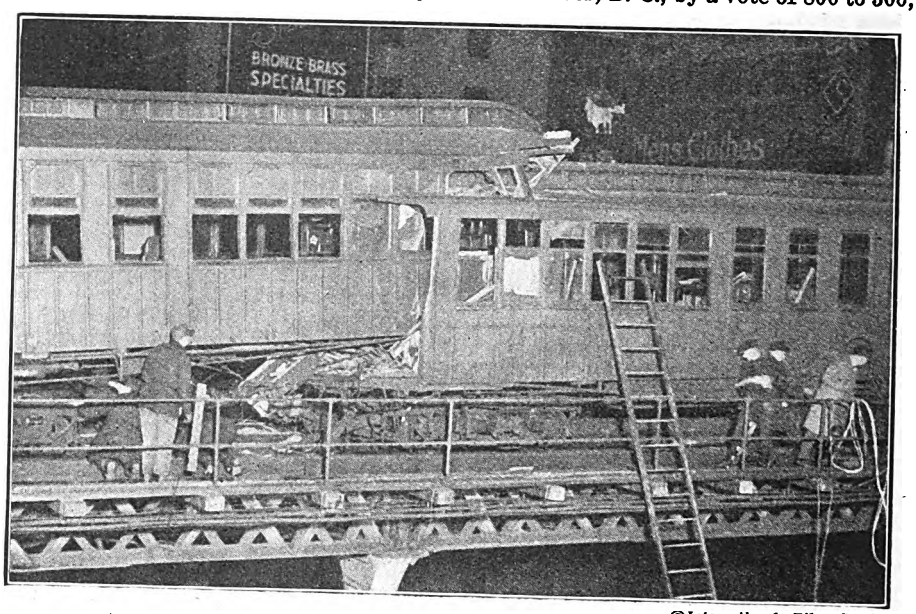
The municipalities, however, decided to go ahead without government assistance, and the Hydro-Electric Commission drafted by-laws to be voted by the people. Then the government again warned the municipalities that the by-laws were not in accord with the law, and that, if carried by the voters, they would one and all be disallowed. It is claimed that Sir Adam Beck was warned to take no part in the campaign, but he spoke at many meetings, with the result that all by-laws save one were carried. Sir Adam has stated publicly, however, that if the government declares the by-laws invalid his hands are tied and he can do nothing.

States Should Make Their Own Labor Laws. — The Arizona law prohibiting injunctions to prevent boycotts and picketing was held to be invalid by the United States Supreme Court on Dec. 19 in the case of William Truax, who employed his cooks for more than eight hours a day, with the result that union men boycotted the place and practically put it out of business. Chief Justice Taft in rendering the opinion pointed out that the case differed materially from that recently decided in the Tri-City Labor Council, Granite City, Ill., where peaceful picketing was declared to be legal. Justices Holmes, Pitney and Clark dissented on the ground that the states should be allowed to make their own labor laws.

Inquiry Made Into Elevated Equipment

Prompted by the train wreck on the Ninth Avenue elevated line of the Interborough Rapid Transit Company, New York, N. Y., in which one man was killed and several persons injured, the Transit Commission has begun a public examination into the adequacy and safety of the elevated railway's present equipment and also of its operation.

A description of this accident was given in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 7.



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WORK OF RESCUE IN PROGRESS IN NEW YORK ACCIDENT

Co-ordination Lacking in Transit Development Plan

Three agencies created by the State of New York—the Port Authority, the Transit Commission and New York city—are now endeavoring to solve the transportation problem of the city, and one of them, the city of New York, refuses stubbornly to co-operate with the others.

The Port Authority, working under a treaty between New York State and New Jersey, seeks unification of all transportation facilities, land and marine, in all parts of the harbor, so that goods and passengers may be landed in the most economical and expeditious manner possible. The Port Authority has been commissioned to develop the territory with which it deals, not for the immediate, selfish benefit of one sector or another but in the way which will make the best provision for all who use the water and land approaches to New York.

The Transit Commission seeks to coordinate and extend the passenger carrying railroads of New York's five boroughs in accordance with a design which shall make each of them most useful to the residents of the city it serves immediately, and likewise to contribute to the excellence and efficiency of the general transportation system.

The Port Authority and the Transit Commission wherever their plans have overlapped have found it practicable to work in harmony. The Tammany administration of New York has its own scheme to build transportation lines for passengers and for freight in New York city, but this scheme has not been developed in harmony with the Port Authority or the Transit Commission.

Men Vote Against Strike

Electric railway employees of the British Columbia Electric Railway, Vancouver, B. C., by a vote of 800 to 500, voted against going on strike and in favor of accepting a reduction of 10 per cent, recently recommended by a board of conciliation. The vote was taken in Vancouver, Victoria and New Westminster on Jan. 3 following a mass meeting held on Dec. 31 and a recommendation from the executive of the union to turn down the award. Better counsels prevailed and the award was accepted. The new scale, which takes effect immediately, provides for the following rates of pay in cents per hour:

Motormen and conductors:	
City lines	58½
Interurban lines	60½
Car repairers	63
Barn janitors and cleaners	52
Machinists, blacksmiths and armature winders	72
Carpenters and painters	69
Mechanics' helpers	58½
Track laborers:	
City lines	54
Interurban lines	49½

In addition to these wages, working conditions were modified to affect employees to the extent of a reduction of about 2½ per cent. The union has signed an agreement with the company which may be terminated in thirty days at any time, although the company offered to pay the proposed wages for one year.

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Massachusetts Situation Improved

Relative to the electric railway situation in Massachusetts the Department of Public Utilities says in its annual report to the Massachusetts Legislature for 1922:

Some improvement has occurred in the electric railway situation, due, in the main, to somewhat lower operating costs. . . . The improvement has not been so great that any marked or extensive reduction in fares has been possible, but there are signs that lead us to hope that some reduction may be possible in the not distant future.

The use of one-man cars has increased. It is possible that the use of these cars will be a large factor in enabling the companies to render to communities service that otherwise could not be furnished. With proper safeguards and over certain lines the one-man car is both safe and feasible. The commission is inclined to favor such use wherever it can be done with safety to the public and to the advantage of the companies.

On the question of jitneys the commission says:

The use of the so-called "jitney" or "jitney bus" in competition with electric railway lines has decreased. In certain communities where there are no street car lines or where the tracks have been abandoned jitneys or jitney buses are operating.

It seems apparent that the jitney or jitney bus and the trolley cannot compete to serve the same community along or upon the same or parallel lines or routes with advantage to either. To provide service where no trolley service is available or to extend and supplement service furnished by the trolley seems to be the useful and proper function of the jitney. The commission hopes that such service may be provided wherever possible. There are legitimate fields in which the jitney can operate, in all probability, to the advantage of the communities, and in such fields its use should be encouraged.

Toledoans Forsake Even "Hooch"

T. R. Strall, manager of the lost Article Department of the Community Traction Company, Toledo, Ohio, did a little reminiscing in the January number of *Sparks*, the official publication of the railway. How patrons of the cars can leave behind them some of the things they do probably becomes more mystifying each day to the corps of workers in his organization.

From umbrellas, purses, lunchboxes, fur scarfs — even "hooch" now (an enigma, indeed) — the articles are of such varied type that he believes he could supply any article necessary for any occasion. The daily routine of the business has its exacting and unpleasant duties—listening to the sad and sometimes confidential tales of the "applicants," but in his opinion for real amusement it has any show "backed off the boards."

Same Wage Scale in Effect in Atlanta

Following a recent conference between officials of the street railway department of the Georgia Railway & Power Company, Atlanta, Ga., and officials of the Street Railway Employees' union, a new contract was signed by the company and the union which carries the same wage scale during 1922 that prevailed during 1921. Wages of motormen and conductors are fixed as follows:

For the first three months, 44 cents per hour.

For the next nine months, 46 cents per hour.

After nine months, 48 cents per hour.

In the event of grievances or other questions that cannot be settled by conference between the company and the union a clause in the new contract provides that such matters shall be referred to a board of arbitration, and that the decision of the board shall be accepted by both sides without further parley.

Electric Rail Transportation Permanent

Electric rail transportation is in Minneapolis, Minn., to stay, according to T. Julian McGill, vice-president of the Minneapolis Street Railway, because no other means of transportation is so safe and dependable and at the same time so cheap. He foresees no future in which the bulk of electric transportation is not on rails. Mr. McGill, in discussing the development of the city to distant districts, said:

The necessity for rapid service to the close-in district will make necessary lighter, more quickly operated cars from the loop to a zone where transfer points are readily accessible to all outlying districts.

I cannot imagine the time when the street car running on rails will disappear from downtown Minneapolis, because it will always give the most dependable and rapid service for short headway transportation.

I think subways are remote here. Chicago has no subway and probably will have none for many years to come, and Minneapolis may still attain much growth without being brought to consideration of the subway problem. We may have short tunnels as for instance in the Lowry hill district on Hennepin Avenue, as a means of relieving traffic congestion and facilitating operation of cars, or a tunnel through the Kenwood hill to care for a big volume of increased business which must come with growth of the lake district. We may have an elevated line.

The auto bus and the trackless trolley undoubtedly will prove effective in supplying auxiliary transportation service on streets where there is not a demand for short time headway, but because the trolley gives cheap, efficient, dependable service in the least time for the least money, I believe, it will be a good many years before the street car on rails will disappear from Minneapolis streets.

Elgin's Suggested Franchise Cares for Regular Rider

Distinguishing regular from occasional riders, and fencing off three and one-half hours each day when a 5-cent fare should be effective, the City Council of Elgin has concluded a proposal for a new franchise which will soon be presented to Federal Judge Evan A. Evans, now acting practically as overseer of the Aurora, Elgin & Chicago Railroad.

Not only does the City Council include in the proposed franchise a 5-cent fare for the hours from 7 a. m. to 8 a. m., from noon to 1 p. m., and from 4:30 p. m. to 6 p. m., and a 7-cent fare for casual riders, but the elimination of pavement assessments, with the exception of Prospect Street, for five years. The Council will also insist on the paying of other assessments already levied for new pavements or repairing. No new levies will be made for the five-year period. Annual license fees and street sprinkling will be eliminated under the new franchise to be presented, but the city will ask that the railway be required to maintain the paving between the tracks and 1 ft. outside the track.

As explained by Mayor Arwin E. Price, the proposition which the City Council is making is that the company sell twenty-ride tickets for $1 or fifty rides for $2.50, the tickets to be good only during certain specified hours. The franchise now backed by the City Council is based on the continuation of operation on the present two-man system.

T. E. Mitten Seeks Better Understanding

The Philadelphia (Pa.) Rapid Transit Company ran an interesting full page advertisement in the *Ledger* of Jan. 3 "in the Hope of Creating a Better Understanding for the New Year." One half of the page is a letter from T. E. Mitten, president of the company, addressed to the Mayor, commission bodies and citizens.

In this communication of the company the plan of the Stotesbury-Mitten management is reviewed and the achievements of ten years co-operative effort are given. In his letter Mr. Mitten stresses the point that the company should not be asked to contribute from the present earnings to make up losses sustained by operation of city built lines "as this would not be fair to P. R. T. stockholders."

The second half of the "ad" is a reproduction from the Dec. 31 "Service Talks" entitled "A Bit of Rough Sledding" and "Here's to You, Strongheart," the latter championing the cause of the bank account.

Limited Train in Canton-Akron Service Wrecked

The first car of the southbound Canton-Akron Limited train of the Northern Ohio Traction & Light Company due in Akron at 11:22, on Jan. 5, left the track at Stop 36, between Bedford and Fells, at 11, due to a broken wheel. The rear trucks of the first car remained on the track, being torn loose from the car. The second car did not leave the track. There were seventy-three persons in the two cars. Seven persons were taken to a hospital in Cleveland, but nine others only slightly injured were able to transfer and continue on their journey.

Service on the line was delayed only one hour. There were no deaths and no one dangerously injured. When the car jumped the track it ran along on the ties about 200 ft., and turned over on its side. The fact that it was a steel car, in the opinion of the management, evidently prevented a very serious accident. The car was of the 1500 type and was obtained from the Kuhlman plant about a year ago. It was only slightly damaged. The wheel that failed had been placed on the car as recently as Dec. 17, 1921.

Tell All You Know About "Safety"

The Community Traction Company, Toledo, Ohio, wants each and every employee to try to upset the dope of the wise statisticians who prophesy a total 14,000,000 injured and 100,000 killed in the United States during this year in public accidents. *Sparks* for January impresses upon conductors and motormen how large a part they can play in the spreading of the safety idea and in actually sparing lives.

As a good start for this year's safety campaign the company has started a prize story contest. To the conductor writing the best story on "Safety" as pertains to his particular position $10 will be awarded. The winner of the second best story will receive $5. This same arrangement will apply to motormen, shopmen, trackmen and to all office employees as well. All are invited to give their ideas on "Safety Always" and of course are urged to practice what they are preaching.

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News Notes

Railway Franchise Drafted.—A new franchise has been drafted by the city of Champaign, Ill., and soon will be presented to the Urbana & Champaign Railway, Gas & Electric Company for approval.

Want Smoking Cars. — The Central Ratepayers' Association of Toronto, Ont., has requested the Transportation Commission to provide smoking cars for workingmen on the various routes. A recent order which prohibits smoking on street cars is alleged to be a hardship on many of the passengers.

Wants Ordinances Declared Unreasonable.—The Hammond, Whiting & East Chicago Railway, Hammond, Ind., has filed a complaint with the Indiana Public Service Commission asking that certain ordinances of the city of East Chicago, requiring extensions of the street railway system, be declared unreasonable.

Salary Ordinance Passed.—Over the veto of Mayor Hugh M. Caldwell, the City Council of Seattle, Wash., passed the salary ordinance for 1922, putting into effect reduction in all salaried municipal employees wages and placing the electric railway trainmen on the monthly basis of policemen and firemen.

Ninty-one Fatal Accidents Recorded.—The number of fatal accidents on electric railways in Massachusetts in 1921 was ninety-one. The number of accidents caused by broken or loose wheels, broken journals and axles reported was 67; accidents caused by spread rails, broken rails, defective special work, poor surface and alignment of track, 230.

No Agreement in Joliet.—Conferences are being held between J. R. Blackhall, general manager o fthe Chicago & Joliet Electric Railway, Joliet, Ill., and representatives of the railway employees with respect to the proposed reduction in wages and working conditions. It is said that the men are opposing the abolition of the nine-hour day.

People Vote Against Increase.—By 2,000 majority the people of Hamilton, Ont., voted down a proposal to allow the Hamilton Street Railway to charge a 5-cent fare, though the City Council had previously indorsed the change. The old fares of six unlimited and eight limited tickets for a quarter have as a consequence again been put into effect. The company claims that it cannot pay its way with the present rates and a curtailment of the service is expected.

Considering Electrification. — The Michigan Central Railroad is now considering electrifying its lines between Niagara Falls, Ont, and Windsor, head officials having recommended the change. With hydro power now plentiful from the world's greatest power canal at Niagara Falls, N. Y., it is estimated that it will be much cheaper than steam. It is impossible to use steam engines on the road for operation in the tunnel under the St. Clair River.

Glendale Asks for Electric Line.—Glendale, Cal., has presented a petition to officials of the Salt Lake Railroad asking that the Glendale Avenue line of the road be electrified into Los Angeles. Members of the City Council expressed the belief that the company would act upon the suggestion and the petition and that in all probability passengers would soon be able to ride from Glendale to Exposition Park in Los Angeles for a 10-cent fare.

Will Give Fuel to Charity.—The executive committee of the Indianapolis (Ind.) Street Railway has voted to give 200 cords of old ties and stringers to any charity organization applying for them. The ties are now piled on the gravel pit property at West Minnesota Street and Eagle creek. The ties and stringers will make excellent fuel when sawed and split, Robert I. Todd, president of the railway, said. The charity organization receiving the gift must haul the wood away.

Wage Cut Announced.—C. B. King, manager of the London (Ont.) Street Railway, has served notice on the employees of a reduction in wages of 3 cents an hour, to take effect on March 1. Platform men are now paid 43 cents an hour the first year, 46 the second and 48 the third and subsequent years. The new scale will mean 40 cents the first year, 43 cents the second and 45 cents the third and subsequent years. Officials of the union have announced that they will oppose the cut.

Separate Pension System Suggested.—At the recent hearing on the proposed ordinance establishing a pension fund for city employees of San Francisco, Cal., it was suggested that the names of all the employees of the Municipal Street Railways be placed on a separate pension fund and not under the general relief fund. This plan has met with the approval of T. A. Reardon, president of the Board of Public Works, and Fred Boeken, superintendent of the Municipal Street Railway.

Contends Election is Unlawful.—Efforts are being renewed to promote the extension of the East End line of the Cincinnati (Ohio) Traction Company to California, Ohio, although an ordinance authorizing the extension was overwhelmingly defeated at the recent election. The chairman of the Citizens' Committee contends that in a ruling of the Supreme Court on a referendum for the proposed extension it had been stated that the matter should be presented at a special election.

Seeks Different Extension.—Business men of Connersville, Ind., are planning to meet soon and name a committee to visit Charles L. Henry of Indianapolis, president of the Indianapolis & Cincinnati Traction Company, in an effort to induce him to extend the line from Connersville to Cincinnati instead of from Rushville to Cincinnati, as is said to be contemplated. Mr. Henry is reported to have announced at Washington a few days ago that the road would be extended from Rushville as soon as conditions would warrant the step.

Bridge Abandoned.—The Louisville and Nashville Bridge, one of the four bridges which connects Cincinnati with Northern Kentucky cities, has been abandoned for electric railway purposes, by the South Covington & Cincinnati Street Railway, Covington, Ky. The traction company, which has operated its Campbell County lines over the bridge for the past fifteen years, has no further use for the structure since the cars on these lines have been re-routed over Third Street to the Dixie Terminal, through which they are operating.

Another Chance Offered.—Owing to the success of the short story contest in the Legion number of the Railwayan, published by and for the employees of the Kansas City (Mo.) Railways, another contest will be held in the February issue. The subject of the next contest will be "Why the Kansas City Railways Has One of the Best Street Railway Organizations in the United States." All are invited to show their literary talents and also to tell the world "what we think of our own organization." A cash prize of $25 will be offered to the winner.

Will Revive Proposal to Electrify.—J. Cameron Wilson, Mayor of London, Ont., has announced that he intends to revive the proposal to electrify the London, Huron & Bruce branch of the Grand Trunk Railway, running between London and Wingham. The municipalities, he believes, will be willing to have the Ontario Hydro-Electric Commission operate the road as a radial and put up the money for its purchase. If the railway is acquired it will have to be taken over with the consent of the dominion government, as it is now a part of the Canadian National Railways system.

Ask Court to Determine Powers.—Texas and Wisconsin, in cases now before the Supreme Court, are asking that the court determine the power of the Interstate Commerce Commission to regulate intrastate schedules and passenger fares. Counsel for Texas, in his arguments, attacked the validity of sections of the transportation act providing for the establishment of the Railroad Labor Board. He also attacked the assumption of the commission to regulate railroad construction, to order abandonment of line and to supervise financing of carriers incorporated by the State.

To Confer on Headlight Standards.—David E. Matthews, chief of the railroad inspection division of the Indiana Public Service Commission, invited master mechanics of nine leading interurban systems in Indiana to confer with him on Jan. 5 about interurban headlight standards. The 1921 Legislature directed the commission to prescribe electric line headlight standards. Mr. Matthews and his staff have been making tests for several months and soon will hold the general conference to discuss the possibilities. He said the principal difficulty in prescribing a standard is the varying voltage of current available for headlights.

Commission Order Suspended.—By an order entered on Dec. 10 in Investigation and Suspension Docket No. 1450 the Interstate Commerce Commission suspended from Dec. 12, 1921, until April 11, 1922, the operation of certain schedules published in Supplement No. 2 to Terre Haute, Indianapolis & Eastern Traction Company's I.C.C. No. 70 and Supplement No. 1 to Interstate Public Service Company's I.C.C. No. 24. The suspended schedules provide cancellation of joint rates from Indianapolis, Ind., and stations in Indiana south thereof, including Louisville, Ky., to stations on the Ohio Electric Railway and points in Ohio on other lines, which cancellation would result in combinations of rates being applicable thereafter.

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Financial and Corporate

Dispute Over Tax Payment

Vice-President Draper Says Cincinnati Traction Company Is Not $700,000 Behind In Taxes

A breach has been opened between the city administration and the Cincinnati (Ohio) Traction Company and action has been started which may lead to changes in the agreement under which the local railway operates. The matter came to a head following a meeting which was held at the Republican headquarters attended by city officials, members of the Republican advisory committee and Walter Draper, vice-president of the traction company.

SEGREGATION HAS BEEN CONSIDERED

The purpose of the meeting was to divulge the recommendations contained in the annual report by former Street Railway Director William C. Culkins, in which Mr. Culkins recommended the separation of the Cincinnati Traction Company from the other companies with which it is affiliated.

The report was first discussed and then a proposed ordinance deferring payments of the city's tax by the traction company for a period of six months, during which time no increase in fares could be made under penalty of nullifying the ordinance. Mr. Draper was next called upon to present his views in the matter. He voiced objections to the period for which the ordinance was drawn and to the clause repealing the entire ordinance in the event of an increase in fares.

Mr. Draper declared that the ordinance should be drawn for a period of one year, the same as the ones deferring the traction company's payment of taxes for 1920 and 1921, and explained that under the service-at-cost ordinance, if the traction company showed a deficit for two consecutive months, fares would have to be increased a half a cent a month later. Unforseen circumstances might bring about such a deficit during the life of the ordinance, he pointed out, and if the measure deferring payment of taxes should be voided by the ensuing raise in fares the necessity for payment of the year's taxes would create another deficit and another increase in fares.

As to separating the enterprises which are combined under the name of the Cincinnati Traction Company, Mr. Draper said that the company officials had considered the advisability of such a move, but that it could not be done safely until they knew what to expect from the city, and that the passage of an ordinance deferring the tax payment for six months only would give them a sufficient grasp of the future to warrant such a departure.

SERVICE-AT-COST GRANT HAS FAILED

In the discussion which followed members of the Republican advisory committee and Mayor George P. Carrel showed considerable favor to the proposition of separating the traction company from its allied interests in an effort, as one member expressed it, "to secure a condition which will set aside all the railway transportation evils of today in Cincinnati and promote the existence of a smaller rate of fare than 7 cents without danger of the same being disturbed by fluctuating conditions such as those that arise under the service-at-cost ordinance.

The opinion seemed to prevail among the committee members that the service-at-cost ordinance has proved to be a failure and is not operating to the satisfaction of either the city administration or the traction company.

A committee was appointed to consider the matter and report back without delay, formulating, if possible, a plan for the proposed separation which will meet with the approval of the city administration.

Mr. Draper said that the belief was erroneous that approximately $700,000 was due the city from the traction company. He said:

> Under the service-at-cost ordinance, if we show a deficit for two succeeding months a half a cent raise in fares is necessitated. As the payment of the city's tax, which amounts to about $30,000 a month, would have caused such a deficit, City Council passed ordinances deferring the payment of our taxes for 1920 and 1921 until they were earned, so that the car riders would not have to pay those taxes in increased fares. Accordingly, we do not actually owe for these taxes until our earnings will allow us to pay them. Under the service-at-cost ordinance, which regulates our earnings, the only way we can pay the taxes is to increase fares. But this none of us, the company, the city government, or the people, wants to do.
>
> For this reason we can not be thrown into receivership as some of our friends are advocating. We are not bankrupt. We can pay our debts when they come due, but the tax debt is not actually due, because of the ordinances deferring it.

At a recent session of the City Council a resolution calling for the forfeiture of the franchise was referred to the committee on street railroads.

Mr. Storrs Thinks Earnings Periods Are Not Comparable

A statement of the operating results of the Bridgeport division of the Connecticut Company, New Haven, Conn., for the week ended Dec. 24, as submitted to the Public Utilities Commission by President L. S. Storrs, shows that during the week of the 5-cent fare experiment the total receipts were $39,747, as compared with $39,262 received for the week ended Nov. 19, when the 10-cent fare was in force. The loss in receipts for the current week from the last week of the flat 10-cent fare was only $514, as compared with the $4,500 loss shown during the first week of the trial test.

A similar report for the Norwalk division shows that there has been a gain of $378 for the week ended Dec. 24 over the receipts of the week ended Nov. 5, which was the last week of the 10-cent fare in that city.

President Storrs in his report to the commission states that owing to the increased amount of traffic which always occurs during the week preceding the Christmas holiday the figures are not comparable with receipts for the last week before the 5-cent fare went into effect.

Hope Held Out of Lifting Receivership

Announcement was made on Jan. 4 at New Orleans, La., that plans are being formulated to effect a settlement of the receivership of the New Orleans Railway & Light Company through the formation of a new company. The negotiations are being carried on by C. C. Chappelle, representing the security holders of the company, acting in behalf of the Chase National Bank, New York, in connection with the New Orleans banks.

The Chase National Bank, acting as depositary, has had transferred to it 90 per cent of the common stock of the New Orleans Railway & Light Company, representing all the interests of the American Cities Company in the local railway, and a committee on reorganization, headed by J. K. Newman, New Orleans, as chairman, H. L. Falk, secretary, and Lynn H. Dinkins, Archibald Kains, Lewis H. Parsons and Percy Warner, is planning to reorganize the five public utilities companies controlled by the American Cities Company in accordance with plans outlined previously in the ELECTRIC RAILWAY JOURNAL.

Commissioner Paul Maloney of the Department of Public Utilities is not yet prepared to reopen the conference with the representatives of the security holders of the company, despite published reports to the contrary. When he decides definitely to do so, it is his intention to ask G. M. Dahl, vice-president of the Chase National Bank, to come to New Orleans to assist in adjusting the trolley tangle.

$24,000,000 a Year Saved by Commission at a Cost of $470,000

Harley W. Brundige, president of the State Railroad Commission of California, on Sept. 26, in addressing the Women's City Club of Los Angeles, reviewed the history of the commission and the development of its regulatory powers, while Chester Rowell, one of his associates on the commission, also pursued the subject further of the powers of this body and the prospects for their continuance.

Particularly illuminative was Mr. Brundige's detail of the organization of the department, employing 150 experts and technicians at an approximate cost to the State of $470,000 a year and a saving based on figures from the United States Labor Index, of $24,000,000 a year latterly.

Mr. Brundige further disclosed the facts that the present commission under its enlarged responsibility and powers, disposes of as much business in four days as the former commission with its limited jurisdiction applying to steam lines alone, and that of decidedly narrow range, did in forty-two years. In other words, the records show that the former commission, from 1876 until 1912, a period of forty-six years, got out twenty-three opinions and orders, while the present commission rendered 148 opinions and orders and disposed of 252 informal complaints in one month, and in the fiscal year ended July 1, 1921, disposed of 1,375 formal opinions and orders and considered 3,042 informal cases. This embraces a jurisdiction increased to 750

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major utilities, exclusive of 850 auto-truck and bus lines.

"Regulation will survive only if it will continue to protect the public against extortion and exploitation," said Mr. Rowell in his address further enlarging upon the subject, "with the provision that said regulation also enable the utilities to render their service and finance themselves to expand that service." Public ownership was given as the alternative of regulation, but "until we can transform our governments so as to make them fit for public ownership this public regulation must survive, as also as many utilities as possible, as long as possible after that."

Commission Will Consider Abandonment

The Ohio State Public Utilities Commission will act on the motion for abandonment of the Interurban Railway & Terminal Company, which operates a line from Cincinnati to Lebanon, Ohio, on Jan. 31.

Officials of the Cincinnati Traction Company have been asked by residents of Silverton, Ohio, through which the Interurban Railway & Terminal Company operates, to extend its service to that community, in the event that the motion of the latter company is approved by the Public Utilities Commission. The traction company now operates a line within a mile of Silverton. Walter Draper, vice-president of the traction company, said that the matter has been taken under consideration.

Kentucky Tax Assessments Announced

The Kentucky State Tax Commission has been busy the past few days in announcing the results of its assessments for taxation. Railway lines operating in only one county are taxed locally, and the State Tax Commission accepts the figures of the county taxation authorities. Included in the list of lines operating in only one county are the Louisville Railway, Owensboro City Railway, Maysville Street Railway & Transfer Company, and the South Covington & Cincinnati Railway.

The Tax Commission assessed the Louisville & Interurban Railway, which operates several suburban lines out of Louisville, and as far as Shelbyville, at tangible value of $1,107,295; and franchise at $642,705. The Louisville & Southern Indiana Traction Company, tangible value, $22,155; franchise, $97,884; Louisville & Northern Railway & Light Company, tangible, $10,000; no franchise.

Based on assessment of the Jefferson County Commissioners the Louisville Railway has been assessed at tangible value of $4,388,505 and franchise value of $6,561,495, making a total of $10,950,000. The Paducah Electric Company has been assessed on a tangible basis of $178,485 and franchise of $421,515; South Covington & Cincinnati Street Railway, tangible, $838,206; franchise, $1,611,794. A number have not been completed and reported as yet.

New Receiver for Staten Island Road.—Federal Judge Garvin has appointed Mortimer Brenner receiver of the Staten Island Midland Railway, Staten Island, New York, to succeed the late Jacob Brenner.

Financial News Notes

$300,000 Stock Issue Asked. — The Indiana & Michigan Electric Company, operating in St. Joseph, Elkhart and other counties in Indiana and Michigan, has asked the Public Service Commission for authority to sell $300,000 of its preferred stock at par to reimburse the company's treasury for expenditures which were made in improving its plants.

2,000,000 Passengers Carried.—The monthly statement of the Utah Light & Traction Company, St. Lake City, Utah, for November shows a total operation of 42,920 car hours; 414,254 car miles. There were 2,422,845 revenue paying passengers who were carried an average mileage of 0.171, with an average earning per mile of 38.22 cents.

Canadian Property Losing Money.—The municipally owned electric railway of St. Thomas, Ont., is losing $61 per day, according to the annual statement presented by the railway committee to the City Council. The fare is now 5 cents. Passengers carried in 1921 totaled 645,479, the daily average being 1,882. The revenue of the railway for the year was $30,954 and the expenditures $51,770.

Pays Dividend in Preferred Stock.—The Virginia Railway & Power Company, Richmond, Va., has declared a dividend of 6 per cent on the preferred stock, payable in preferred stock at par on Feb. 1 to stock of record Jan. 10. The dividend is for the twelve months ended Dec. 31, last, it was explained. A distribution of the same amount in preferred stock was made on this issue last January for 1920.

Authorizes Discontinuance. — The Hattiesburg (Miss.) Traction Company has been authorized by the City Commission to discontinue service on the Main and Mobile Streets line. Financial loss in operating on these particular streets is the reason for the abandonment. The commissioners believe that in authorizing this discontinuance some electric railway service can be spared by the city.

Surplus in Hagerstown.—New operating income of the Hagerstown & Frederick Railway, Hagerstown, Md., for ten months of 1921 has amounted to $493,849, which is only about $6,000 less than was reported for all of 1920. The company shows a surplus after all expenses, taxes, interest and fixed charges for the ten months of 1921 amounting to $228,456 as against $184,723 for 1920.

Temporary Abandonment Authorized.—The City Commissioners of Bozeman, Mont., have authorized a temporary suspension of electric railway service to allow the company to repair and repaint its equipment, the winter months being the best time to make such improvements. The time limit for the suspension is set at April 1. The operating company is the Chicago, Milwaukee & St. Paul.

Number of Passengers Decreases.—The Georgia Railway & Power Company, Atlanta, Ga., in its monthly report of operations for November, 1921, filed recently with the State Railroad Commission, states that the total number of passengers carried during November, 1921, was 5,936,236, as compared with 6,197,971 in the same month of 1920, a decrease of more than 250,000 passengers. Total receipts for November, 1921, were $404,339 as compared with $422,169 in the month of November, 1920.

Receivers Will Continue Operation.—Judge Avery of the Superior Court of Hartford, Conn., has approved the report of operation as filed by Harrison B. Freeman, as receiver of the Hartford & Springfield Railway, and the Judge has issued an order that Mr. Freeman, as receiver, continue the operation for four months from Dec. 10. The railway is now going through the lean months of the year, the Judge declared, and a better financial showing should be made in the early spring.

Fifty-five per Cent of Stock Sold.—The North American Company, New York, N. Y., announces that of the first instalment of 15 per cent of the new issue of stock offered to stockholders for subscription at $50 a share 55 per cent had been taken up on the last day on which subscriptions could be made. Those subscribing to the issue have an option throughout the remainder of the present calendar year to subscribe to an additional amount to stock equal to 1⅓ times the amount already subscribed for. The new stock, which is of the series "A" issue, is now being put out by the company.

Readjustment Plan Declared Operative.—The public trustees of Eastern Massachusetts Street Railway, Boston, Mass., has declared capital readjustment plan effective as of Jan. 4. It has been slightly modified by making adjustment stock non-cumulative until Feb. 1, 1924, and it has been found unnecessary to ask common stockholders to provide any common stock. The bondholders and stockholders will be notified soon when and where to present securities for necessary endorsement or exchange. The trustees express belief that prompt acceptance of readjustment plan will put the property in sound financial condition, and enable it to build up necessary credit. The plan for the financial readjustment was described in detail in the ELECTRIC RAILWAY JOURNAL for Nov. 12, 1921, page 880.

Unclaimed Bond Interest Held for General Creditors. — Federal Judge Mayer has decided against De Rothschild Fréres of Paris and Gustav Pordes, who asked the court to direct the Empire Trust Company to pay the interest due on Oct. 1, 1918, on 4½ per cent mortgage bonds of the Interborough Consolidated Corporation, the holding company of the Interborough Rapid Transit and the New York Railways. Of a fund set aside by the corporation to pay the interest, $431,910 is still on deposit. The complainants explained that the bonds held by them had been deposited in a Brussels bank and that the war had prevented them from obtaining possession of their property. The interest due the two defendants aggregates about $44,000. Judge Mayer held that as the corporation is now in the hands of a trustee in bankruptcy the funds on deposit must be held for the benefit of the general creditors.

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Traffic and Transportation

Commission Will Determine Interstate Carriers

The exact extent to which the Bamberger Electric Railroad and the Salt Lake & Utah Railroad are to be considered as interstate carriers is to be determined as a result of two resolutions just passed by the Industrial Commission of Utah. The resolutions summon the Orem line and the Bamberger line to appear Jan. 10 and 11 respectively, before the commission and show cause why they should not be brought under the terms of the Utah workmen's compensation act.

Neither of the railroads has any rails extending beyond the state lines or anywhere near the state lines. Each, however, has traffic arrangements with interstate carriers, and some shipments are handled in interstate commerce, though the vast bulk of the revenues of both roads is derived from interstate commerce. Neither line has complied with the compensation act, either by insuring in a stock company or the state insurance fund or by taking the necessary procedure to qualify as self-insurers under the act.

Company Makes Appeal to Patrons

The Connecticut Company, Hartford, Conn., has put out its new transfers for the new year and on the reverse side is the following appeal to the riding public:

In order to get new cars and other property needed to improve the trolley service, money must be borrowed which means that trolley earnings must be enough to provide a fair return on the actual value of the property. During the last five years the Connecticut Company has earned on an average of only 3 per cent on the actual value found by an appraisal made by the Public Utilities Commission. Would you be willing to purchase securities of a company showing such a financial statement? Is it not necessary for your trolley company to have the revenue needed to enable it to keep up with the growth of your city?

No Zones for Indianapolis

"There will be no zoning of the Indianapolis street car system while I'm on the Indiana Public Service Commission, I'll promise you that," said John W. McCardle, chairman of the commission, in an address before the Optimists' Club in Indianapolis recently. In leading up to this declaration Mr. McCardle said:

We had an election here some time ago, and we elected Lew Shank as Mayor. Well, Lew is all right. He's just like I am—he makes some mistakes. And he has said that when he got to be Mayor he was going to "zone" the street car system. I want to ask if that would be fair, to go out to the outskirts, where men built homes with their little savings, and beautified them, and improved the city? That outlying ground was chiefly built on the strength of a 5-cent fare.

Turning impressively before he continued, Mr. McCardle said:

Now, then, are we going to charge these men that made outer Indianapolis, that built it about the circumference—are we going to charge them 10 cents, while other people ride for 5 cents/ It that fair? No, I say it would be class legislation. Look out, Lew, you've got something to do before you get that done. There are some of us over there in the commission that are not going to be shoved off the track!

Then came his promise that no zoning should be done while he was on the commission.

Ten Cents in New Castle

Commission Has Ordered This Cash Rate With Eight Tickets for Fifty Cents

Local passenger fares in New Castle, Pa., and the municipalities in the Shenango Valley consisting of Sharon, Farrell, Sharpsville, Wheatland and West Middlesex, will be 10 cents cash with tickets eight for 50 cents, according to the decision handed down by the Pennsylvania Public Service Commission on Jan. 4.

New Castle is a city of 50,000 population. The railway lines there are operated by the Pennsylvania-Ohio Electric Company. The fare existing at the time of the decision was 7 cents cash and tickets six for 40 cents. Up to January, 1918, the fare in New Castle had been 5 cents, with eleven tickets for 50 cents. At that time a rate of 6 cents cash, tickets eleven for 60 cents, was instituted with the approval of the Public Service Commission.

Application was made by the company for a cash fare of 10 cents in the Public Service Commission in August, 1919. After several hearings, the Public Service Commission in March, 1920, fixed the fare at 7 cents cash, tickets six for 40 cents. In August, 1920, the company again renewed an application to the Public Service Commission for approval of a cash fare of 10 cents with the ticket rate to be fixed by the commission. The application of the company was refused on April 19, 1921, and the commission ordered the company to maintain the same rate as before. A motion for rehearing was filed by the company and was finally sustained. Several additional hearings were then had with the final result as noted above.

The lines in the Shenango Valley are operated by the Shenango Valley Traction Company, a subsidiary of the Pennsylvania-Ohio Electric Company. The fare on these lines, which serve an extensive and important industrial district, was 5 cents up to May, 1918, at which time a fare of 7 cents with tickets at the rate of six for 40 cents was placed in effect by the company and afterward approved by the Public Service Commission. In December, 1920, the company raised the fare to 10 cents cash, tickets six for 50 cents. Complaints were filed by a number of the communities, but the rate was not suspended and went into effect and has been in effect since that time. The hearings before the Public Service Commission were upon the complaints filed by the various communities, with the result that the order of the commission fixed the cash fare at 10 cents and tickets eight for 50 cents.

The new rates of fare under the tariffs filed by the company in response to the order of the commission went into effect on Jan. 11.

Court Sets Aside Authorization for Bus Operation

The Sound Transit Company, Seattle, Wash., has announced through its lawyers that it will carry its fight to the State Supreme Court for the right to restore auto stage transportation between Seattle and Roosevelt Heights. This decision was reached after an opinion of Judge John M. Wilson in the Superior Court at Olympia which set aside the order of the Department of Public Works. The department had authorized the company to operate a motor bus service subject to ordinances of the city of Seattle.

The opinion of Judge Wilson states that "such a limitation might result in a total abrogation of the rights, granted under the certificate of convenience issued by the State Department of Public Works." The opinion leaves the Sound Transit Company without authority for the operation of its service. The transit company had taken the case to the Superior Court in Thurston County, in an effort to have the limiting clause, "subject to the ordinances of the city of Seattle," stricken from the certificate. The new decision sets the whole order aside.

Judge Wilson also refused to sign an order directing the State Department of Public Works to issue another certificate of necessity without limiting clause, and the jitney attorneys at once announced their intention of appealing this decision to the Supreme Court of the state, which has already ruled that the city has the right to ban jitneys from the public streets.

In the meantime, the City Council is making strenuous efforts to provide adequate service to the Cowen Park and Fairview districts, now seriously lacking in transportation. An ordinance was introduced in Council, and referred to the utilities and finance committees, appropriating $35,000 from the city railway fund for the purchase of municipal buses to be used on the Cowen Park and Fairview lines, in connection with the street railway, but not operating into the business section.

Residents of the Cowen Park district lost their fight recently to restore jitney bus service from their district to the downtown section of the city, when the City Council rejected their petition for through bus transportation. The action was taken after the Council had received a report from D. W. Henderson, superintendent of railways, who declared the restoration of competitive jitney lines would work a hardship on the economical management of the city's traction system and in the payment of its bonded obligations. The Cowen Park residents then urged the Council to take over the operation of the feeder buses now running in the district on a fifty-fifty basis with the railway. The Council has not yet taken action on this latter move, but it is expected a favorable vote will be taken.

Reduced Fare in Chelsea

It was recently announced by Manager Hardy of the Chelsea division of the Eastern Massachusetts Street Railway that a fare reduction between Crescent Avenue, Chelsea, and Scollay Square would go into effect on Jan. 11. A twelve-ride commutation ticket will be issued for $1. This will replace the 10-cent fare which has caused considerable dissatisfaction.

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Rehearing Granted in P. E. Rate Case

Hollywood and Glendale Object to Increase Which Makes Interzone Fare 10 Cents—Company Continues to Operate Under New Schedules—Commutation Ticket Prices Readjusted in Decision

A rehearing of the case of the Pacific Electric Railway, Los Angeles, Cal., which was recently granted an increase in passenger rates, has been set for Jan. 24, following a petition to the California Railroad Commission by the Hollywood Chamber of Commerce and the city of Glendale. In the meantime the railway company is continuing to collect the new fares which it put into effect on Jan. 1. For Hollywood and Glendale residents this fare is 10 cents under the new zoning system. The commission stated it would not be justified in suspending the rates, since the company had announced its compliance with the decision, a condition precedent to the new rates becoming effective.

AS STATED in the ELECTRIC RAILWAY JOURNAL for Jan. 7, the zoning system provided in the order establishes two districts in which a 6-cent fare prevails. The fare from points in one zone to those in another is 10 cents. This affects a large number of persons connected with the moving picture studios in Hollywood.

The 6-cent arbitrary charge for the 5½-mile zone in Los Angeles is eliminated. The lower mileage basis and the elimination of the 6-cent arbitrary fare result in reducing all long distance fares out of Los Angeles. Some increases will result in the case of trips too short to absorb the regular mileage charge applicable to the city zone. All fares originating at points outside of Los Angeles or between intermediate points or stations will receive the straight reduction.

Reductions in interurban fares provided for are:

One way, from 3.6 cents to 2.75 cents a mile. Round trip, from 3 cents to 2.25 cents a mile. Thirty-ride family commutation books, from 1.8 cents to 1.75 cents a mile.

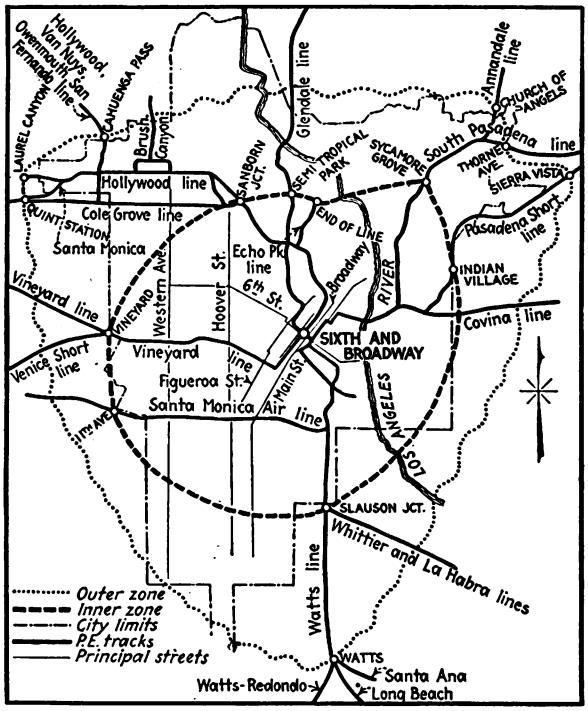
These fares are on a straight mileage basis from depot to depot.

Commutation fares will be as follows:

Ten-ride individual book, 2 cents per mile; thirty-ride family book, $1.75 cents per mile; individual calendar month book, 1 to 10 miles, 1.2 cents per mile; 11 to 15 miles, 1.08 cents per mile; 16 to 20 miles, 0.96 cents per mile; over 20 miles, 0.9 cents per mile.

In accepting the commission's decision, the Pacific Electric Railway announced that it will not oppose the plan advanced by the commission relating to universal transfers in the inner zone. A universal transfer system would be effective between the cars of the Los Angeles Electric Railway and those of the Pacific Electric. At a later date the commission may decide on an extension of the transfer privilege outside the inner zone.

Adopting the claim that interurban service cannot in fairness be made to support losing local lines, the commission directs that the Pacific Electric Railway enter into negotiations with the communities outside of Los Angeles where the company is operating other local street car lines and where this local service is not on a self-sustaining basis and report in six months either that the local service can be made self-sustaining or apply for permission to abandon such service. The opinion is expressed by the commission that the local street car systems of the company in Pasadena, Long Beach, Santa Monica, Venice, San Bernardino and possibly San Pedro can be put on a self-sustaining basis, but the commission feels that in Riverside, Redlands, Pomona and Beverly Hills there is little possibility of the service being put on a self-sustaining basis.



LOS ANGELES TERRITORY INCLUDED IN TWO 6-CENT ZONES

A similar recommendation is made in the case of San Pedro, as after discussing various recommendations made by the Board of Public Utilities of Los Angeles the commission points out that the proper service in San Pedro could be provided by an additional expenditure of $120,000 for the most necessary trackage and equipment required. To justify continued operation and annual gross revenue of $130,000 would be necessary. This is $70,000 more than was taken in in the year 1921. The commission states that no such increase can be expected with the continuation of the present motor bus competition in San Pedro.

ZONE SYSTEM FOR HOLLYWOOD ONLY NOT APPROVED

A suggestion that a zone be established for Hollywood only was not approved, the commission pointing out that the rates proposed in the present decision provide for a zone system, not only affecting Hollywood but the entire city of Los Angeles.

In the matter of school children's tickets the commission stated that the company has authority under the public utilities act to issue reduced rate transportation to children attending institutions of learning, but that the commission is not authorized to order school children's tickets in effect. The commission says that the company will be expected voluntarily to grant to school children the most liberal privileges possible under the provisions of the public utilities act.

In accordance with the order, the company has submitted plans for the betterment of Hollywood service, and on other lines too, involving $2,600,000. The plans are follows:

1. Beginning Jan. 3 about 200 additional men will be put to work in the shops and 250 more on the tracks, to put the equipment in first class condition. This will cover deferred maintenance, which the commission recommended be taken care of. It will involve an expenditure of approximately $140,000 more per month for betterments and maintenance, of which between $60,000 and $65,000 will be the payroll for the new employees in the shops and on the tracks.

2. At the earliest possible date orders will be placed for fifty new cars, which will cost approximately $750,000. As a standard for the Hollywood service the company has decided upon a center-entrance, multiple-unit-controlled car, which means that the new cars will be of a type that can be operated either singly or in two or three car trains.

3. The Pacific Electric Railway is not willing to submit itself as to location of tunnel or tunnels for betterment of the Hollywood service, but it will prepare plans as rapidly as possible in accordance with the order of the State Railroad Commission, though it will ask for more time than the thirty days within which the commission ordered that such plans be filed.

The commission expressed agreement with the Los Angeles Board of Public Utilities that there should be no further delay in improving transportation in Hollywood and disagreed with the Hollywood Board of Trade that the commission should hold in abeyance suggested improvements.

In arriving at a rate base for the system as a whole the commission eliminated property apportioned to losing local services and also disregarded these local losses in considering a fair return. Accordingly a theoretical rate base of $67,021,455 was arrived at. This is the historical reproduction cost, plus $2,600,000 required for the improvement of the Hollywood lines. This is approximately $18,500,000 under the company's claim of a fair rate base. On the estimated theoretical rate base taken by the company it is estimated that a return of 6.3 per cent might be expected.

Estimating the return in the Los Angeles city service of the Pacific electric lines for the twelve months from the effective date of the new rate schedule at $120,000, the commission points out that this is only slightly more than 1 per cent on the operative property used in the local service.

This estimate, the commission states, is included to show that even under the proposed zone fare the local Los Angeles service is little more than self-sustaining and merely meets the test which was laid down to determine whether or not the continuation of any local service is justified.

Freight rates were not cut.

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Five-Cent Fare Held Too Low

Federal Court at Chicago Declares City's Lawyers Failed to Make Case Before Commission—Commission Cannot Act Arbitrarily to Force Its Views—History of Case Reviewed

Enforcement of a 5-cent fare on the Chicago Surface Lines was enjoined as being confiscatory by order of the United States District Court on Jan. 9. The temporary restraining order issued by Federal Judge Carpenter on Nov. 24 was continued in force by Judges Evans, Carpenter and Page and was made effective until a final hearing on the petition of the companies to have the writ made permanent. Meanwhile the companies are required to continue issuing transfers which have been used as rebate slips since the original order was entered.

THE ruling of the three federal judges sitting *en banc* was a complete victory for the companies. They held that the showing made by the Surface Lines supports the contention that enforcement of the order of the Illinois Commerce Commission would be confiscatory. The court said:

> The pertinent fact charged in the bill, namely, that a 5-cent fare will not permit the companies to earn enough money to pay wages, power and taxes, is unanswered by the record. In fact, the attorney for the commission stated during the oral argument that after putting all the proposed economies into effect there would be available a return of a little more than 1 per cent upon the invested capital.

One of the significant points in the court's decision was the comment made on that part of the commission's order holding that the present service is not worth more than 5 cents. "These findings," said the court, "are entirely beside the question." The court found that the actual operating expenses of the Surface Lines, comprising wages, taxes and power, amount to more than 6 cents for every passenger carried. The opinion said:

> It may be that the Surface Lines could improve their business methods, but the Illinois Commerce Commission is not permitted under the law to force that improvement by penalizing them with a rate which will not return even the operating expenses, and might in fact prevent them rendering any service at all. If the commission had the right, under the act of its creation, to order changes in operation of utilities, in this case it is aiming to accomplish its end by drastic and unlawful means. It is one thing to order changes in routing of cars; reduction in layover time to employees; remodeling of accident and law department; reduction of wages and labor; deferring maintenance and renewals; in fact, to order any variation of operation making for the public good. It is quite another thing, having in mind all of these benefits to the utilities and to the public, to say to the utilities we admit that it costs you more than 6 cents to carry passengers; we will, however, reduce your fare to 5 cents and invite you to test out our opinion as to what improvements may be made in the internal operation of your own business.
>
> The basis of the commission's action in this case is wrong. As outlined by its chairman, and urged by its counsel, supplemented by the corporation counsel for Chicago, it afforded no *cocus penitentics* for the plaintiff railroads. No opportunity was given them to try out the urged reforms. They were told in advance that the medicine was good and that they must take it whether they liked it or not, and irrespective of whether it had any therapeutic value. The orderly, rational and legal method of procedure would have been for the commission to outline these various changes in management and operation and invite the companies to put their suggestions in force, giving the companies an opportunity to demonstrate the benefits or even the possibilities of the order.
>
> All of the changes suggested by the commission are matters of conjecture and opinion, and it is quite within the range of human thought that some of the changes could not be carried out to advantage, either to the companies or to the people. Why then should the Illinois Commerce Commission, discounting impossibility of performance, direct a rate which both it and the city of Chicago admit will not pay operating expenses, to prevail until their views are adopted? Too much commendation cannot be given to any public utilities commission for its interest in public affairs. It will always be forgiven if its enthusiasm leads it to incidental legal excesses. It cannot, however, act arbitrarily to force its views without trial.

The court stated that the reduction from an 8 to a 5-cent rate of fare would have reduced the revenues of the companies by about $22,500,000 a year. Even by cutting the return to 6 per cent, if this were necessary, the judges show that there would have to be saved more than $17,000,000 out of a total of $46,250,000 for operation. They say:

> This presupposes that the plaintiff companies are grossly mismanaged. To determine whether a business is mismanaged, there is no better way than to compare its operating costs with other businesses of a similar character.

Reference is then made to the evidence on this point which showed:

> That the cost of operation of the plaintiff lines is lower per car hour than that of the traction companies in other cities of the country; that the average speed of plaintiffs' cars, excluding layovers, is the highest; and that the amounts expended in damage suits is the lowest, excluding Boston, where a large part of the railway system runs in subways and on elevated structures.

The court quotes a part of the commission's opinion which refers to decreased cost of food and dry goods. In commenting on this the judges say:

> The great difficulty with this argument is that you cannot run street cars on food and dry goods, and we have looked in vain through the record and in the briefs of the defendants to find some concrete suggestion which warrant the court, even if it were pertinent in this case, to regulate the plaintiffs' expenditures for maintenance.

The court finds that the record shows that steel rails, one of the principal materials used, will cost more this year than last because of a pre-war contract under which they were purchased last year. As to the suggestion that the companies could make a large saving in their schedules, the judges say this was foreclosed by the statement of one of the commissioners during the hearing which barred further evidence on that point. They also say there is no proof that a saving could be made in the claim department or that the cost of maintenance was too high.

In referring to the contention of the city lawyer that "the contract with the city should be taken as a whole, and that a minor return to-day to the present stockholders was a matter of no importance," the opinion says:

> This argument would make the present stockholders sustain a loss of $5,000,000 a year because other and more fortunate stockholders, dead and gone perhaps, received in the past a fair—or more than fair—return. To require the companies today to run at a loss and say that all the earnings of the companies during the entire contract period of operation should be equalized is like trying to run the mill wheel with water that has already run by.

The order on which this decision was based was issued by the Illinois Commerce Commission on Nov. 23, to become effective on Nov. 24 at midnight. It directed that fares be reduced from 8 to 5 cents and that the companies try out certain economies to offset a prospective loss of $22,500,000 in revenues. Company lawyers secured a temporary restraining order from Judge Carpenter, and several days later attorneys for both sides argued the case before Judges Baker, Carpenter and Page. Judge Baker did not take part in the decision, his place having been taken by Judge Evans. Meanwhile the companies have been issuing extra transfers as rebate slips.

It is uncertain what the next move of the city or the commission will be. The administration is pledged to secure a 5-cent fare, and the only hope for that now is that the higher court may take a view of the matter different from that of the three district court judges.

The city received another jolt on Jan. 6 when Judge McKinley of the Municipal Court held that it had not made out a case in a suit seeking to secure $3,500,000 from the Chicago Railways for use of streets. The city was unwilling to accept this money when tendered under the contract ordinance as part of the 55 per cent of net receipts.

Members of the City Council have been stirred to action recently by the successive defeats suffered by city lawyers and are insisting that some compromise be arranged for the betterment of service.

It was expected that President Blair of the Surface Lines would appear before the Council committee on Jan. 12 to outline his proposal for a new franchise.

Truck Dealers Protest Against Railway

A group of automobile truck dealers recently appeared before the City Commission of Salt Lake City with a protest against the Utah Light & Traction Company being permitted to haul either road-building materials or structural materials through the streets of the city as freight. It was claimed by the truck dealers that the truck dealers combined are paying more taxes than the traction company, and that they were entitled to recognition.

With regard to the hauling of materials for construction of street surfacing, the commission pointed out that since the people were paying for the improvement they were entitled to have it done at lowest cost. The truck companies' representatives stated that they should not thereby cause annoyance to people residing elsewhere along the line used by the street car company, especially if the difference in cost were low.

The matter was dropped when Mayor Neslen pointed out that the commission did not care to bind itself to any hard and fast policy, in view of possible emergencies that might arise, but promised that, in case the commission were not inclined at once to refuse a permit for the hauling of freight, the trucking companies would then be notified.

The railroad has at all times the right to haul freight for its own construction, under restrictions provided in the franchise, but it must obtain a permit before hauling freight for any other purpose.

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Employees of Long Service Favored

In making up the new wage scale for motormen and conductors of 30 cents for the first year, 35 cents for the second year, and 40 cents thereafter, with 5 cents an hour more for safety car operators, the Virginia Railway & Power Company, Richmond, Va., has endeavored, as far as possible, to favor those employees who have been in the service in excess of two years.

Of the 583 motormen and conductors affected in Richmond, only 11 per cent are one-year men; 36 per cent are two-year men and 53 per cent come within the highest rate of wage.

On the Petersburg division only forty-two men are affected, and 24 per cent of these come within the highest rate. All others are two-year men.

In Norfolk, 302 men are affected. Twenty-four and one-half per cent of them are one-year men and a like number are two-year men. Fifty-one per cent of them come within the highest rate.

In Portsmouth, 102 men are affected; 12.6 per cent of them are one-year men; 22.4 per cent are two-year men, and 65 per cent of them will come within the highest rate of pay.

Of the 1,030 men affected throughout the entire system, 61 per cent of them will come within the highest rate under the new scale. Twenty-seven per cent of them will come within the next highest rate and only 12 per cent will be subject to the minimum rate.

Will Lower Fare Increase Patronage, Tuscaloosa Asks?

Whether or not a 6-cent fare will produce a larger revenue than an 8-cent fare is an interesting experiment that is to be tried at once by the Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala. The Alabama Public Service Commission has authorized the reduction.

T. W. Ross, general manager of the company, appearing before the commission, stated that the street railway department had been losing steadily and that after careful study of the situation it had been decided to apply for a reduction in the belief that this would result in far greater patronage for the lines and a resultant increase in the gross revenue. If the experiment proves successful the company will apply for a reduction to 5 cents at the end of sixty days. In the event that increased revenue does not result the company anticipates asking permission later this year to "junk" the line.

Underground Garages Suggested for Traffic Relief

Municipal garages under Bryant and Central Parks is the solution for New York City's automobile parking problem during theater and shopping hours, which has been offered by Dr. John A. Harris, special deputy police commissioner in charge of traffic.

The garage under Central Park, it is estimated, would accommodate 30,000 cars and that under Bryant Park about 4,000. In presenting his plan to the finance and budget committee of the Board of Estimate Dr. Harris said:

> Parked cars today cause congestion, loss of life and injuries. Our plan provides that when a passenger would leave his car to enter a store or a theatre for a considerable space of time, the car should be immediately taken to Central or Bryant Park, subject to recall by an electric flashlight system probably requiring six telephone operators in each parking tunnel. Practically all the large department stores have been studying the suggestion and are enthusiastic about it. They are willing to have individual operators at their own expense to handle carriage calls.
>
> It would be feasible to have the whole plan under municipal operation. That would spread the cost to which stores and other institutions would be willing to contribute.

Changes Suggested in Utility Law

Authority from the Legislature to fix just and reasonable rules and regulations to be observed by utility companies in making extensions of existing facilities is requested by the Board of Public Utility Commissioners of New Jersey in a report filed with Governor Edwards. This recommendation follows a statement that many of the uilities refuse to make extensions of facilities unless the applicants for the service defray the costs of installation.

Another suggested change is to the effect that the law be amended so that if a utility increases its rates, the increase is disapproved by the board and its order of disapproval is set aside by the Supreme Court, the increase shall not go into effect until the board has had a reasonable opportunity to rehear the case and determine what, in the light of the court's decision, would be a reasonable standard of rates.

Referring to jitney regulation, the report states that the granting of licenses subsequent to March 15, 1921, to operate on a street parallel with the line of an electric railway appears to make the parties operating under such licenses public utilities. The board recommends that the law authorizing municipalities to enact ordinances providing for the licensing of auto buses be supplemented by a provision to the effect that if such ordinances are not enacted and licenses obtained, the operation of jitneys therein would be unlawful.

Order Ends Augusta Jitneys

By a vote of ten to seven the City Council of Augusta, Ga., ruled recently that the jitney must go, accepting a recommendation of the police committee to limit jitney bus operation. J. G. White & Company, New York, operators of the Augusta-Aiken Railway, pledged the company to maintain fifteen-minute schedules on all lines with seven and one-half-minute schedules on the principal lines during the busiest parts of the day. The company further pledged itself not to apply for increased fares within the next twelve months; to sell 8-cent tokens in lots as small as five; to charge only a 5-cent fare for school children and teachers, and to discuss with Council in ninety days the matter of reducing fares.

Some time ago the company was refused permission by the Georgia State Railroad Commission to increase its fares from 6 cents to 10 cents, whereupon it appeared before the United States Circuit Court of Appeals and secured a writ to enjoin the commission from interfering with it as to rates and received authority to increase the fare to 10 cents. This resulted in the jitneys coming back, but these vehicles are now curbed effectually by action of the Council through its new agreement with the company.

Disabled Veterans Want Lower Fare

Frank R. Spinning, supervisor of transportation in the Department of Public Works at Olympia, has been appealed to by representatives of disabled veterans in Tacoma, Wash., to use his influence in obtaining lower fares in Tacoma for disabled veterans taking vocational or placement training in the city. The appeals set forth that the allowance of the federal board of vocational training to men taking training is so low that the men seek rooms in the suburbs where rents are lower and as a result become electric railway patrons in going to and from their places of training.

They cannot afford to pay the present 8-cent fare, and ask for a reduction to 5 cents. Supervisor Spinning has announced that he will take the matter up with the Tacoma Railway & Power Company, and do all possible to secure lower fare for the disabled men.

Commutation Books to Be Issued

The Seattle & Rainier Valley Railway, Seattle, Wash., has filed with the Department of Public Works a supplement to its tariff, which in effect reduces the fare between Seattle and Renton from 20 to 15 cents. The supplement provides for the issuance of commutation ticket books, 26 tickets to the book for $3.90, to replace the present through cash fare of 20 cents. The supplement becomes effective on Jan. 15.

Opinions Expressed on Free Rides

According to an opinion of T. J. L. Kennedy, first assistant corporation counsel, Seattle, Wash., General Superintendent D. W. Henderson of the Seattle Municipal Railway cannot deny any employee of the city's traction system the right to ride free on cars. The opinion prevents Mr. Henderson from putting into effect an order he had issued, directing that only trainmen in uniform when riding to and from the city, be allowed the privilege, which order, Mr. Henderson estimated, would save the lines about $100 daily. Mr. Kennedy stated that such an order could not be put into effect without amending the existing fare ordinance, which provides that street railway employees, when furnished with a proper badge, shall ride free on street cars.

City Again Considers Fare Reduction

The municipal authorities at Hartford, Conn., are still wrangling over the question of petitioning the Public Utilities Commission for a reduction in fares of the Connecticut Company in that city. The members of the Board of Aldermen are divided as to whether it is advisable to file the petition in as much as the Public Utilities Commission has made it clear that there was no likelihood of further reductions in electric railway rates until the termination of the trial tests now in progress in the cities of Norwalk and Bridgeport. However, Hartford has under consideration the hiring of an expert to gather statistical data to be used at the hearing. For this purpose the Common Council has appropriated $1,000. The matter is now in the hands of a special committee for further consideration and report.

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Hearing on Free Fare Zone Soon

A hearing on the motion for an injunction to prevent the St. Paul (Minn.) City Railway from abolishing the so-called free fare zone between Snelling Avenue, St. Paul, and Emerald Street, Minneapolis, will probably take place on Jan. 14. Judge F. M. Catlin of the Ramsey District Court on Jan. 6 refused to issue a temporary restraining order on the ground there was not sufficient reason given for such order. The company had decided to abolish this zone at midnight on Jan. 7.

Judge F. M. Catlin and Judge J. C. Michael already in a previous hearing for injunction against the 7-cent fare asked by the company had stated that fares should be collected in this zone. For many years passengers have ridden for one fare to Snelling Avenue and to Emerald Street from either city, whereas the through fare is 10 cents. The neutral zone, which is all in St. Paul, is about 2 miles in width.

Louisville Fare Case to Be Argued in February

The suit of the Louisville (Ky.) Railway against the city of Louisville to prevent the city from interfering with the collection of a 7-cent fare will be argued before the United States Circuit Court of Appeals at Cincinnati during the mid-winter term of court in February.

The case has been returned from the United States Supreme Court. The argument will be on the original motion, that of dissolving the temporary injunction granted by Judge Walter Evans of the United States District Court at Louisville, restraining the city from interfering with the company in collecting the 7-cent fare.

The case was taken to the Supreme Court on certification of the Circuit Court of Appeals, but was returned by the higher court to the lower court for trial on the ground that the Supreme Court is without jurisdiction.

Two Million Passenger Decrease

Two million fewer passengers rode on the lines of the Lincoln (Neb.) Traction Company during the last year, which reduced the revenue $170,000. This was made known by W. E. Sharp, president of the company, in his annual report to the stockholders. He suggested a lower fare for ticket buyers, and a higher fare for the casual rider.

The report stated that the company had reduced its floating indebtedness by $50,000. Operating expenses have been considerably cut, through reduction in prices of fuels and other materials which have been used in overhauling 50 per cent of the equipment, but the cut in revenue almost offset this. The payment of dividends on preferred stock has been delayed until securities can be sold to care for the indebtedness.

The slump in passenger traffic was due to the increase in auto traffic according to Mr. Sharp, who looks forward, he said, to a return to a higher level as soon as automobile owners have outgrown the novelty of using their machines. The recklessness of drivers who go at a great speed through the streets where there are trolleys, accounts for a large number of the accidents. Statistics of the company showed that 70 per cent of the accidents were automobile accidents, with a steady decrease in "boarding and leaving" car accidents.

Reduced Week-End Fares in Effect

Reduced week-end fares on the Sacramento Northern Railroad and the San Francisco-Sacramento Railroad effective on Jan. 6 were authorized by the Railroad Commission on Dec. 30 upon the application of Zac T. George, traffic manager of the Sacramento Northern, also acting in behalf of the San Francisco-Oakland Terminal Railways, San Francisco-Sacramento Railroad and Gridley Auto Bus Company.

The week-end schedule approved is as follows:

Friday to Tuesday fares—One and one-half fare for the round trip.
Saturday to Monday fares—One and one-third fare for the round trip.
Sunday excursion fares—One and one-fifth fare for the round trip.

Placing the week-end fares on a uniform basis will result in increases from San Francisco-Oakland to Oroville and to Marysville. Present fares now apply only from the bay points named to Marysville and Oroville, while it is desired to establish the fares between these cities as well as between all points on the electric lines.

The increase in the Friday to Tuesday fares now applying from San Francisco to Oroville is 18 cents and from Oakland to Oroville 30 cents; from San Francisco to Marysville 63 cents, and from Oakland to Marysville 75 cents.

Fort Worth Waits on Galveston Decision

Settlement of the controversy between the city of Fort Worth, Tex., and the Northern Texas Traction Company, involving the validity of the 7-cent fare, is expected to follow immediately on the settlement of the Galveston, Tex., electric railway fare fight, which is now before the United States Supreme Court. The Fort Worth case has been held up awaiting a decision in the Galveston case, as the two cases involved the same issues. The findings of the Supreme Court in the Galveston case will furnish a precedent for the settlement of the Fort Worth case, according to Corporation Counsel R. E. Rouer.

The electric railways of Fort Worth and Galveston had been operating under similar franchises, in which the traction company was permitted to charge a fare deemed adequate to cover cost of operation and provide a fair and just return on the investment. The traction company could raise fares without an order from the city government. When such increase was put into effect, the city sought an injunction to restrain the traction company officials from collecting the increased fare, and the matter thus found its way into the courts.

The Northern Texas Traction Company raised fares to 7 cents and the City Council then adopted an ordinance directing the traction company to lower fares to 6 cents which the traction company declined to do. The matter has rested at this point, neither side to the controversy taking action pending a decision in the Galveston case.

Transportation News Notes

Lower Rates in Effect.—The Dayton & Troy Electric Railway, Dayton, Ohio has announced a fare reduction of approximately 10 per cent on round trip tickets. Lower rates became effective on Jan. 1.

Round-Trip Fare Cut.—A round-trip ticket between Washington, D. C., and Alexandria, Va., is now being sold for 40 cents by the Washington-Virginia Railway. This is a cut of 4 cents each way. The ticket is good for a period of five days.

Short Line Advances Rate. — The State Public Service Commission has authorized the St. Louis & Jennings Railway, St. Louis, Mo., to sell six tickets for 25 cents. The old rate was seven tickets for 25 cents. This short line runs on Floriscant Avenue to Jennings station in St. Louis County.

Wants Five-Cent Fare. — Ward 3 Improvement Association of Quincy, Mass., at a recent meeting expressed its sentiment on the 5-cent fare, declaring that it was time for the Eastern Massachusetts Street Railway to put into effect a lower fare. The demand was for a 5-cent charge from the Braintree line to Quincy Square and from East Milton to Quincy Square.

Lower Fares on Short Lines.—Henry L. Doherty & Company, the operating managers of the Hattiesburg (Miss.) Traction, have announced that a 5-cent fare has been put into effect on three short lines without transfer privilege. Aside from these lines the cash fares remain at 10 cents with three tickets for 25 cent. The management states that the report of a general reduction in fares from 10 cents to 5 cents is unfounded.

Traffic Signals Approved.—Electric traffic signals controlled from a tower at what is known as Five Points in Atlanta, Ga., one of the most congested crossings to be found in any city of the south, have proved so successful in controlling and expediting traffic at this point that extension of the system throughout the downtown section of the city is being strongly advocated by R. S. Turner, city electrician. It is considered likely that due to the success of the experiment at Five Points five other traffic signal towers may be installed at the more congested crossings in the downtown section of Atlanta during the present year.

Announces Through Freight Service.—Jamestown, N. Y., which has been without competition in freight service since the sale of the Jamestown, Westfield & Northwestern Railroad to the A. N. Broadhead interests, is now to have the advantage of a second railroad as far as freight is concerned. Arrangements are being made by which the Pennsylvania Railroad will make shipments in and out of Jamestown over the Jamestown, Westfield & Northwestern Railroad, which will haul the cars by electric locomotives to the junction of the two roads at Mayville, N. Y. This road has been operated electrically for ten years, but has not carried any through freight.

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Personal Mention

James Holcomb Is Commissioner

Attorney Succeeds Fielder Sanders as Head of Cleveland's Street Railways for Two Years

James W. Holcomb, an attorney of Cleveland, Ohio, has been named by Mayor Fred Kohler to be Cleveland's street railway commissioner for the next two years, succeeding Fielder Sanders, who resigned on Dec. 31.

Mr. Holcomb is sixty-four. He has had considerable experience in electric railway operation from a legal, financing and constructing standpoint. He was instrumental in the formation of companies to build the Columbus, Delaware & Marion Electric Railway, the

J. W. HOLCOMB

Buffalo, Dunkirk and Western line, the Cleveland, Painesville and Ashtabula line and the Cleveland, Alliance and Mahoning Valley line.

Several years ago, however, he sold most of his railway interests and became an investor and broker in real estate. A number of years ago he was active in politics.

Born in Portage County of parents of Connecticut origin, Mr. Holcomb received his early schooling in Ravenna, Ohio, and later went to Cornell University. Returning to Ravenna he studied law and practiced there, and served three terms as Mayor. In 1892 he removed to Cleveland, where he practiced law.

R. B. Hincks Now Attorney for Strickland Properties

With the reorganization of the various utility and electric companies of which the late Col. J. F. Strickland of Dallas, Tex., was president, including the Dallas Railway, the Texas Electric Railway, Texas Power & Light Company, Dallas Power & Light Company and other companies, reorganization of the legal department of these companies is also announced. Robert B. Hincks, who has been a member of the law firm of Templeton, Beall, Williams & Callaway, which has been general attorneys for all the Strickland companies, has resigned from this company to become general attorney for the Texas Power & Light Company and the Dallas Power & Light Company, thus effecting a separation of the legal heads of these two companies from the other Strickland interests. Joe A. Worsham and A. S. Rollins are now associated with the law firm of Templeton, Beall, Williams & Callaway, which firm now becomes Templeton, Beall, Williams & Worsham. This firm will continue to represent the Texas Electric Railway and Dallas Railway.

C. C. Chesney Receives Edison Medal

Cummings C. Chesney, chief engineer and general manager of the Pittsfield works of the General Electric Company, was the recipient for the year 1921 of the Edison Medal "for meritorious service in electrical science or electrical engineering or electrical art." This award, which is made by a committee of twenty-four members of the American Institute of Electrical Engineers and which is among the highest honors of the kind in the field of electrical engineering, was made to Mr. Chesney for his work in the development of transmission apparatus, generators, condensers, transformers and converters during his association with the late William Stanley of the Stanley Electric Manufacturing Company, Pittsfield, Mass., which concern was amalgamated some years ago with the General Electric Company. Mr. Chesney is one of the pioneers in electrical discovery. He made plans for the first successfully designed, advanced types of alternating-current generators for high voltages.

H. M. Ingram Executive Officer of New York Commission

Harry M. Ingram of Potsdam, New York, has been appointed executive officer of the Public Service Commission by Chairman William A. Prendergast. Mr. Ingram will have general supervising charge of all bureaus in the commission. The necessity of an executive who would co-ordinate under one head the various activities and functions of the Public Service Commission and its bureaus has long been evident.

Mr. Ingram was a law partner of the late Edwin A. Merritt, who was speaker of the New York State Assembly in 1912, and has had twenty years experience in the state service. He is considered one of the best executives in the state.

For the past fifteen years most of his time has been devoted to legal construction work in the building up of important legislative measures. He assisted in the preparation of the consolidated laws of New York State in 1907 and 1908, was a member of the board of statutory consolidation and later was associated with the joint legislative committee on the simplification of civil practice, which prepared the new court practice act in this state.

Mr. Ingram watched the public service commission law grow from its infancy and is thoroughly familiar both with its intricacies of construction and its possibilities of execution. The position was created by the State of New York with the idea in mind that it would assure to the people a more conscientious and thorough administration of the public service commission law. It is generally regarded as a step in the right direction.

Edits Service Bulletin

E. F. Kelley Heads Publication of the Kentucky Public Utilities Association

E. F. Kelley, Louisville, Ky., has just been made editor of the *News Service Bulletin*, a bi-monthly publication of the Committee of Public Utility Information of the Kentucky Association of Public Utilities.

Mr. Kelley is secretary to James P. Barnes of the Louisville Railway. He has been with Mr. Barnes continuously since 1905. From 1903 to 1905 Mr.

E. F. KELLEY

Kelley was with the New York Central, and thereafter was with Mr. Barnes at Syracuse, Utica, Rome, Little Falls, Oneida, Rochester, and Schenectady, N. Y. In 1920 he became secretary to Mr. Barnes at Louisville.

Mr. Kelley has been active in many interests in Louisville. Besides efficiently making the decision as to who shall and who shall not see Mr. Barnes, Mr. Kelley has served as secretary of the Kentucky Association of Public Utilities. His keen knowledge of traction affairs in the state and country and his realization of the difficulties confronting utility companies in their relations to the public fit him especially for leadership as editor of the *News Service Bulletin*. He will be able to forward the constantly growing understanding between the public and the companies. Mr. Kelley is also editor of *Trolley Topics*, the house organ of the Louisville Railway.

Mr. Kelley is a member of the Transportation Club, the Board of Trade and Electric Club, and secretary also of the Kiwanis Club.

Senator Thomas Brown, of Middlesex county, New Jersey, will shortly be named chief counsel for the New Jersey State Public Utility Commission. L. Edward Herrmann, the present chief counsel, will retire to engage in the private practice of law.

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C. Murphey Candler, Atlanta, Ga., who has been chairman for several years of the Georgia State Railroad Commission, definitely announced in January that he would not be a candidate for re-election following the expiration of his present term next August.

H. H. Dean, Gainesville, Ga., has been named district counsel for the Georgia Railway & Power Company, Atlanta, to look after the company's legal interests in the northeastern judicial circuit of Georgia. Mr. Dean has been connected with the company several years.

Thomas Brown, Perth Amboy, has been named new general counsel to the Board of Public Utility Commissioners of New Jersey. He succeeds Mr. Herrmann, who will remain as special counsel to the board during the progress of the Public Service Railway's suit in the federal courts for a permanent 8-cent fare.

James A. Perry, of Atlanta, Ga., a member of the Georgia State Railroad Commission, is being seriously considered by President Harding, it is reported, as an appointee to membership of the Interstate Commerce Commission to fill a vacancy in a Democratic seat recently created. Southern industry is advocating the appointment of Mr. Perry, who is nationally known among public utility officials as president of the National Association of Public Utility Commissioners. His term as a member of the Georgia commission expires next August, but he has already announced that he will be a candidate for re-election to this office.

Obituary

Frank E. Haff, fifty-nine years old, secretary and assistant treasurer of the Long Island Railroad, and of its subsidiary electric railways on Long Island, died on Jan. 2. Mr. Haff entered the employ of the Long Island Railroad on Nov. 1, 1881, as a telegraph operator at the Islip station. He was transferred to the station at Babylon and from there he was promoted into the executive offices and he filled successively various posts until he was made secretary in 1900.

S. H. Pickard, manager of research and efficiency expert for the San Francisco-Oakland Terminal Railways, died suddenly on Dec. 30, as the result of self-inflicted injuries. W. R. Alberger, vice-president of the company, said that Mr. Pickard's act was clearly that of a man not in his right mind. It is the general belief that Mr. Pickard was temporarily unbalanced as the result of the request made to him for his resignation. Mr. Pickard, who had been with the company for eleven years, as special accountant in the auditing department and later as efficiency expert, served in the Philippines during the Spanish-American war with the Thirteenth Minnesota Infantry. Recently he received a commission as captain in the 159th Infantry, California national guard. He was a member of John Jacob Astor Post, Veterans of Foreign Wars, and a prominent member of a number of Oakland business luncheon clubs.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Some Power Plant Development in 1921

Equipment Furnished by One Manufacturer Cited to Illustrate the General Tendencies

In its annual review of engineering accomplishments of the company for the year 1921 the Westinghouse Electric & Manufacturing Company lists a number of power plant installations which are of interest in showing the types of power plant equipment which are being erected by designers under present operating conditions on large power systems. The review, which was prepared by H. W. Cope, assistant director of engineering of the company, states that during the past year a second 70,800-kva., cross-compound turbine generator has been installed at the Colfax station of the Duquesne Light Company, Pittsburgh; this unit is served by four 25,000-sq.ft. Westinghouse surface condensers, equipped with motor-driven circulating and air pumps. The condensers are built with divided water boxes which permit of continued operation under somewhat reduced vacuum while the condensers are being cleaned. Two 43,750-kva. turbine units with surface condensers have been installed at the Hell Gate station of the United Electric Light & Power Company, New York. A 35,300-kva. turbine-generator is now ready for operation at the new Calumet station of the Commonwealth Edison Company, Chicago. One 31,250-kva. turbine-generator with surface condenser is being installed by the Havana Railway, Light & Power Company, Havana, Cuba, and a similar unit is now under construction. A 25,000-kva. unit with jet condenser has been installed by the United Electric Company, Springfield, Mass. Two 25,000-kva. units with 40,000-sq.ft. surface condensers are under construction for the Osaka Electric Light & Power Company, Osaka, Japan. A 47,500-kva. cross-compound unit with jet condenser has been put in operation by the Narragansett Electric Light Company, Providence, R. I. Two 25,000-kva. units with jet condensers have been put in service by the West Penn Public Service Company, Johnstown, Pa., and a similar unit also by the Virginia Power Company, Nitro, W. Va.

Multiple-retort underfeed stokers have been constructed and put in successful operation in combination with the largest boilers ever equipped with a single stoking unit. To facilitate the removal of ashes, double-roll water-cooled clinker grinders have been provided at the innermost end of the stoker. In another large stoker installation each boiler is equipped with a double stoker, firing being done from both ends of the boilers, extremely high combustion rates having been secured, providing good economy at high overload capacities.

The review calls attention to the demand for synchronous condensers in large sizes in connection with power transmission systems. One of the interesting orders comprises three 15,000-kva. and four 8,000-kva. synchronous condensers for the Midi Railway electrification in France.

There seems to be no limit to the sizes in which power transformers can be built. What the review states to be the largest installation of power transformers ever made by one manufacturer comprises fifteen 15,000-kva. 25-cycle units at Queenstown, Ontario. These hold the record for single-phase transformers as to size.

In smaller apparatus, the Westinghouse company has also had some interesting developments during the past year. For the United Railroads of San Francisco two 2,000-kw. synchronous converters were equipped with transformers and tap-changing switches which permit of variation of the direct-current voltage under load. An automatic hydro-electric generating station control was installed for the Blue River Power Company, South Seward, Neb. Further, the automatic service restoring short-circuit interrupters and the automatic sectionalizing equipment for railway feeders have been developed.

Electrification Survey on Canadian Railroad

In connection with proposals to electrify the Tesniskaning & Northern Ontario Railway and its branches, either as a whole or in part, the company's commission has authorized S. B. Clement, chief engineer, and J. G. Kerry, consulting engineers, to report as to the power possibilities along the route, the power requirements for operation, and the general feasibility of electrification. A report, says the *Canadian Railway and Marine World*, is to be ready about the end of March.

There are some very extensive water powers on the Abitibe River, which can be reached for development with the completion of the extension of the Temiskaming & Northern Ontario Railway from Cochrane for 70 miles northwesterly, for which tenders have been asked. It is estimated that approximately 300,000 hp. can be developed at two of the falls alone.

Metal, Coal and Material Prices

Metals—New York	Jan. 10, 1922
Copper, electrolytic, cents per lb.	13.50
Copper wire base, cents per lb.	15.12½
Lead, cents per lb.	4.70
Zinc, cents per lb.	4.77
Tin Straits, cents per lb.	32.37½
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.68
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	2.00
Central, Ill., screenings, Chicago, net tons	1.88
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, New York, cents per lb.	6.50
Weatherproof wire base, N. Y., cents per lb.	16.25
Cement, Chicago consumers net prices, without bags	1.97
Linseed oil, (5 bbl. lots), N. Y., cents per gal.	74.00
White lead, (100 lb. keg), N. Y., cents per lb	12.25
Turpentine (bbl. lots), N. Y., cents per gal.	88.50

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Malleable-Iron Foundry Completed by Ohio Brass

Operations have been started in the recently completed malleable-iron foundry of the Ohio Brass Company at Mansfield, Ohio, according to an announcement made by the company. The addition to the plant is on land adjoining the older Mansfield works, but has separate receiving and shipping facilities. There are three buildings in the addition, including a foundry, a powdered-coal plant and a compressor building. The foundry proper has 100,000 sq.ft. of floor space with provision for the installation of seventy-two machine molders.

An interesting feature of the plant is the use of powdered coal as fuel to heat the core ovens, melting furnaces and annealing furnaces. To house the coal powdering facilities a building 35 ft. x 70 ft. x 55 ft. has been erected, and a 4-in. pneumatic tube is used to distribute the coal to the various points of its consumption in the foundry building. A vacuum cleaning system has been installed to keep the coal building free from coal dust and dirt.

$326,000 Invested in Substations by Pacific Electric

During 1921 a number of very important additions and improvements for the betterment of service were made to the power distribution system of the Pacific Electric Railway. All of the new electrical equipment installed represents the very latest developments of the electrical industry in automatic equipment, motor-generator sets, synchronous converters, transformers and auxiliary devices.

Following is a list of the more important projects started or completed during 1921:

Description	Amount Expended
Consolidation of 600 and 1,200 volt substations in new concrete substation building at San Bernardino	$80,000
Construction of new 1,000-kw., 600 to 1,200 volt portable substation	50,000
Installation of 1,500 kw. synchronous converter in Valley Junction substation	52,000
Construction of new substation and installation of 750 kw. synchronous converter automatic equipment at Van Nuys substation	55,000
Construction of new substation and installation of 1,000 kw. synchronous converter automatic equipment at Arcadia	70,000
Installation of additional equipment and additions to Altadena substation	19,000
Total Expenditures	$326,000

Electric Railway Construction in Norway

Information from Christiania states that the Norwegian Storthing has granted a concession to A.S Akersbanerne for the construction of an electric railway from the center of Christiania to Ostensjo, a distance of about 8 km. (5 miles). Work on this line will be commenced simultaneously with the construction of the Majorsteun-Sognsvandet Railway, a concession for which was also granted recently.

The Christiania Electric Tramway Company will soon begin construction on the extension of its Lilleaker line to Stabaek. This work will cover a distance of about 4 km. (2.5 miles).

Rolling Stock

Macon Railway & Light Company, Macon, Ga., has announced through L. A. Magraw, general manager, that the Macon company spent during 1921 a total of $112,000 for new equipment, including thirteen new electric railway cars and new electrical apparatus for other cars.

Tampa (Fla.) Electric Company has furnished the following specifications of twelve Birney safety cars which were purchased from the St. Louis Car Company and recently placed in operation in Tampa:

Number of cars ordered	12
Name of road	Tampa Electric Company
Date order was placed	June 27, 1921
Date of delivery	Nov. 2 and Nov. 11, 1921
Builder of car body	St. Louis Car Company
Type of car	Birney Safety Car
Seating capacity	34
Weight total	16,000 lb.
Length over all	28 ft. 0 in.
Truck wheelbase	8 ft. 0 in.
Width over all	8 ft. 2 in.
Height, rail to trolley base	12 ft. 7 in.
Body, wood, semi-steel, or all steel	Steel
Interior trim	Mahogany
Headlining	None
Roof, arch or monitor	Arch
Equipment:	
Air brakes	Westinghouse
Armature bearings	Ball
Axles	3¾" O. H. steel, heat treated
Bumpers	3-in. Channel Iron
Car signal system	Faraday
Car trimmings	*Bronze
Conduits and junction boxes	Duraduct
Control	WH-K-63-BR
Couplers	Bar & Pocket
Curtain fixtures	National Lock Washer
Curtain material	Double Pantasote
Designation signs	Hunter Illuminated
Door operating mechanism	Air
Fare boxes	Johnson-Dapron Air Motor
Fenders or wheelguards	HB Life Guards
Gears and pinions	Half WH-Helical, Half GE
Hand brakes	St. Louis Drop Handle
Heater equipment	None
Headlights	Golden Glow
Journal bearings	Friction
Journal boxes	St. Louis
Lightning arresters	6-WH-MP-3, 6 GE Aluminum Cell
Motors	6-WH-508 AN, 6 GE 258-C
Motors, outside or inside hung	Inside
Paint varnish or enamel	Enamel
Registers	International DH10
Sanders	Ohio Brass
Sash fixtures	O. M. Edwards
Seats	Heywood-Wakefield Company
Seat material	Bottom Birch Back Cane Panel
Springs	St. Louis
Step treads	Feralun
Trolley catchers or retrievers	Ideal
Trolley base	Ohio Brass
Trolley wheels or shoes	Wheels
Trucks	St. Louis No. 7 Safety
Ventilators	Utility
Wheels (type and size)	Cast 24-inch

*Aluminum stanchions.

Track and Roadway

Public Service Railway, Newark, N. J., has reconstructed 10.55 miles of track with new rail, and 9.60 miles with renovated rail. There are still from 70 to 90 miles of track to be renovated, according to Richard E. Danforth, vice-president and general manager of the company.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been granted permission to install a grand union at State and Broad Streets, Trenton. The special work will eliminate the backing up of trolleys at that point. The plan was indorsed by the Board of Public Utility Commissioners.

Public Service Company, San Antonio, Tex., announces a program of improvements and betterments for 1922 involving the expenditure of $1,500,000. According to E. H. Kifer, vice president and general manager, new lines and extensions will be built into several growing districts, providing street car service for these districts during the year. Last year the company spent $1,029,855 in extensions and betterments outside of the upkeep and maintenance fund.

Hamilton (Ont.) Street Railway will probably be requested to renew the tracks on King Street from James to Bay Street, on Margaret Street from King to Main Street and on Main to Locke Street, on Wentworth from King to Cumberland Avenue, King Street from Dundas Street to the McKittrick bridge, and Barton Street from Ottawa Street to Kenilworth Avenue. The railway committee has recommended to the City Council that application be made to the Railway Board for such improvements.

Dallas (Tex.) Railway will lay special passing switches and other special steel on the Belmont-Vickery line, making possible the operation of through cars from the business district to the end of the line. These have been shipped from Chicago, according to Richard Meriwether, vice-president and general manager. The steel is expected to be in Dallas by the middle of January and it is expected that through service on the Bryan Street line to these suburbs will be inaugurated early in February, as the special construction work will be done as soon as the steel arrives.

Trade Notes

W. C. Starkey, formerly chief engineer of the Ohio Brass Company, Mansfield, Ohio, has been named vice-president and directing engineer of the Stevenson Gear Company, Indianapolis, Ind.

Safety Car Devices Company has transferred its headquarters from St. Louis, Mo., to Wilmerding, Pa. S. G. Down, general sales manager at Wilmerding, has been elected president of the company to fill the vacancy caused by the resignation of C. P. Cass.

Westinghouse Air Brake Company, Wilmerding, Pa., has announced that Thomas A. McGinley, vice-president and general manager of the Duff Manufacturing Company, Pittsburgh, Pa., was recently elected to its board of directors. He succeeds his father, John R. McGinley, who resigned a short time ago.

Chain Belt Company, Milwaukee, Wis., has opened offices at 735 Ellicott Square, Buffalo, N. Y., and has appointed T. E. Cocker as district manager of that territory. Mr. Cocker for ten years was connected with the engineering department of the New York Central Railroad at Buffalo. He is a graduate of Rensselaer Polytechnic Institute.

Roller-Smith Company, 233 Broadway, New York, N. Y., has announced the appointment of O. I. Eberhardt, Board of Trade Building, Scranton, Pa., as a special representative in the counties of Bradford, Wayne, Wyoming, Luzerne and Lackawanna and parts of the counties of Carbon, Monroe and Schuylkill in the State of Pennsylvania. Mr. Eberhardt will handle the Roller-Smith Company's line of electrical instruments, electric meters and electric circuit breakers in that territory.

Railway Supply & Manufacturing Company, Cincinnati, Ohio, has increased its capital stock from $10,000 to $600,000. The company, previously a part of the Joseph Joseph Brothers Company and which was recently sold by that firm, has made the increase in view of the fact that it will operate independently. The company will continue to keep its headquarters at 1242 Harrison Avenue.

New Advertising Literature

Consolidated Car-Heating Company, Albany, N. Y., is distributing Bulletin No. 22, describing and illustrating all of their newest types of electric heaters for railway cars, offices, buildings and industrial purposes. Apparatus is produced for service on voltages ranging from 110 to 1,800 volts.

"Outspinning the Spider" is the title of a book written in a popular and understandable vein by John Kimberly Mumford, who has written a number of books on industrial subjects. It tells for the first time the history of wire-rope making in this country, for the most part as reflected in the growth of the John A. Roebling Sons Company where the industry began in 1840. The book relates in a vivid way the various processes used and the exacting care necessary in the manufacture of wire rope. Included among the uses to which it has been put are mentioned the construction of the Brooklyn Bridge and the wire-rope barrage laid down in the English Channel during the war.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MACMURRAY, News Editor

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Volume 59 — New York, Saturday, January 21, 1922 — *Number* 3

Make the Superintendency of Equipment a Position of Greater Importance

MANY executives of electric railways are not sufficiently appreciative of the service which can be rendered by a real superintendent of equipment, as differentiated from the master mechanic, largely because they have never had the experience of having such an official on their properties. But the need for larger mental caliber in the mechanical department head has been forced upon the electric railways by the strenuous conditions under which they are now laboring. Men who produce results only by the rule of thumb will get results in the shop no longer, if indeed they ever did get adequate results. Real "concentrated thinking" is needed nowadays, combined with capacity to utilize all of the great mass of available information which can be applied in this line of work and knowledge as to where this information can be obtained.

It has been repeatedly pointed out in this connection that if men of the right type are to be secured and retained, the salary must be liberal and the opportunities for self-expression and development abundant. The superintendent of equipment must be admitted into the circle which surrounds the active managers of the property and his recommendations for improvements, even if these involve the spending of considerable sums of money, must be given respectful consideration.

The proper title for the head of the equipment department is "Superintendent of Equipment," except in special cases. Honorable as is the title "Master Mechanic," it does not fit the job which has been outlined above; the other suggests a position ranking with that of the superintendent of transportation, which is eminently fitting.

Master Mechanic or Mechanical Engineer for Superintendent of Equipment?

THE question which naturally arises in the mind of the manager who is looking for a real superintendent of equipment is where he is to get a man of the right type if he is not fortunate enough to have one already. His success with the property intrusted to him depends to a considerable degree upon the way in which he decides this matter. There is of course no one general answer possible, but he can analyze the qualities of the equipment superintendents of his acquaintance and decide for himself whether a trained engineer who is willing to dig in and learn the business practically or a natural mechanic who has made effective use of his brains while growing up in the shop gets the better results. It all depends on the men available. If there are working in the shop alert and capable young fellows who are willing to subject themselves to the discipline of study outside of shop hours, they are good superintendent timber. If school men can be had who are willing to buckle to, and work with hand and brain, they are promising also. The latter have the advantage in the opportunities which they have enjoyed for obtaining a broad outlook on life and work. Ultimately, it would seem, they will predominate, for if advanced school training is doing for young men what it is supposed to do, it is giving them that analytical capacity which is going to be needed more and more in this field as well as elsewhere. This capacity is in general much better developed in the atmosphere of the school than in that of the shop. But there will always be a place higher up for the ambitious mechanic who reasons about his work and who uses every available means to perfect himself in it.

In charge of equipment departments today a wide variety of types of men will be found. Some have been developed from mechanics right on the property; some have been similarly developed on other properties and installed ready-made; still others have had the advantages of college or industrial school training. Most of the men, however trained, are making good and the average of intelligence in equipment superintendencies is reasonably high. But the present incumbents cannot last forever, and a few should be set doing other things if their betters can be secured at such salaries as the railway managers think they can pay for this work. And even when existing conditions have been met with reasonable satisfaction, there remains the question: Where is the next generation of equipment superintendents to come from?

Encouragement of Thrift Profits Employee and Employer Alike

THE celebration of Benjamin Franklin's birthday anniversary by a country-wide thrift campaign not only honors the memory of a thrifty patriot, but tends toward stability in industry. Many electric railways have taken a prominent part in encouraging thrift among their employees. Their efforts succeed best when they explain frankly that, as employers, they themselves will benefit because men and women with money ahead are better workers than those who live from hand to mouth. At the same time, they can also point out that in building up a satisfied, effective personnel, they are benefiting the employees individually even more than they are profiting themselves. Everybody but the sorehead is satisfied with the results of an energetic intelligent thrift campaign.

There is one great accomplishment which successive thrift campaigns should

"Meet Me at the Monument,"

says President R. I. Todd

in his invitation to electric railway men to come to Indianapolis for the Mid-Year Meeting of Feb. 28. "Count on us, Mr. Todd," will be the response of every one who can possibly get to the meeting, the preliminary program of which augurs well for a meeting of pre-war proportions and spirit.

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eventually bring about. They should make saving respectable and popular, which it is not always at present. The present wasteful habits of Americans generally are due to lack of imagination and lack of inherited and inculcated carefulness. The negro who, when asked if he wished to earn a quarter, said "No, suh, I'se got a quahtah," has many prototypes in more intelligent circles. Lack of imagination hinders the thrift movement, because without the ability to visualize a definite purpose for saving, an individual cannot be convinced of the importance of saving. As for the lack of frugality, a virtue so common in Frenchmen, Scotchmen and other Europeans, this is largely due to the ease with which the necessities of life are earned in this country.

About all that an electric railway management can do to promote thrift locally is to appeal to the imagination of employees and to furnish simple means for saving and investing money. If the prospect of comfort for the individual and his dependents, or the fear of poverty, will not bring results, only grinding poverty itself will do the trick. It is to be hoped that actual suffering will not be necessary before the rank and file of Americans learn the lesson of thrift.

Railway Engineers Should Understand How Girder Rails Are Made

ELECTRIC railway men are apt to accept as a matter of course the many manufactured products which are used in their industry, giving but little thought to the processes through which the raw materials must pass before the products reach the comparatively perfect and finished state in which they receive them. One of these products is the girder rail, which has become so essential as a part of the track construction in many of the larger cities.

The evolution of the girder rail, from the crude makeshifts of the early days to the remarkably uniform and well-finished product of today, has been a matter of considerable wonder to those who have followed the many improvements both in design and in manufacturing methods which have been accomplished. These have centered in the greatly increased depth of section over the early rails; the methods of forming the groove; the maintenance of uniformity of the fishing section, and the generally close conformity of the entire rail to the template section.

The thin webs and bases, combined with the unbalanced distribution of metal between the head and the base, have made the manufacture of girder rails much more difficult than that of ordinary standard T-rails. The task of forming the groove so that it shall conform to template with a reasonable degree of accuracy has been a source of considerable trouble, but is now being performed with a marked degree of success. This has been accomplished through the introduction of the vertical side-roll, or idler-roll as it is frequently called. The use of this roll is one of the principal features which differentiate the processes of rolling girder rails and ordinary T-rails. However, the whole procedure, whereby the massive ingots, always at very high heats, are manipulated, requiring ingenious mechanical contrivances, and are finally reduced by many successive steps to the comparatively small cross-section of the rail, is a fine tribute to the inventive genius of the steel manufacturers.

The article by R. C. Cram on another page of this issue has been prepared particularly to direct attention to the progress that has been made in girder rail manufacture and to encourage the increased use of association standard girder rails because increased use will ultimately produce a reduction in cost of such rails. In fact, it is understood that the adoption of the association standard by one large purchaser recently did actually yield a substantial reduction in cost. Nevertheless, there are inherent manufacturing features which will necessarily make a price disparity between girder rails and low T-rails, and all rail users should understand them.

Can Stockholders' Losses Due to Regulation Be Recovered?

DOLLAR gas, which means a reduction from $1.15, goes into effect in Chicago on Feb. 1 if the order of the Illinois Commerce Commission is carried out, but Samuel Insull is to appeal from the order and instigate a friendly suit to determine whether a utility cannot maintain a profitable rate until it has been able to recoup the losses to stockholders caused by failure of the commission to grant an increase in rates when it was needed and applied for.

The gas company recently declared its first dividend to be paid since August, 1917. The new gas rate is scarcely sufficient to pay the allowable current dividend and affords no possibility of making up any of the losses in the last three years. It was not until June, 1920, that the company succeeded in getting an increase in its rate from 85 cents to $1.15, and costs meantime had risen to such an extent that not only were the shareholders' dividends absorbed but the credit of the company was seriously impaired. During these four "dividendless" years there was actual confiscation of the property, for the benefit of the customers, to the extent that the property owners' returns and surplus were not earned. Had adequate changes in rates been authorized when warranted, the stockholders would have received that to which the law recognizes they are entitled. Mr. Insull estimates that these losses amount to $12,000,000.

This case will be of greatest interest to utility operators because if won it would set up a precedent of very far-reaching importance in the problem of re-establishing the credit of the utilities generally. There is precedent in commission action for allowances of this kind, as when the Tennessee Public Utilities Commission about a year ago allowed a higher rate for gas to the Nashville Gas & Heating Company than was otherwise warranted so as to repay the company for losses sustained through too low a previous rate. Mr. Insull is endeavoring to secure judicial sanction in Illinois for this policy.

This seems an eminently logical position because the earnings of a utility are under constant supervision by the commission, which is usually very prompt in reducing rates if any tendency is observed toward more than the maximum allowance. Hence the company should not be obliged to bear the loss caused by a failure of the commission to raise rates when they are too low, either through inability to reach a decision promptly or through error in judgment.

Mr. Insull will also seek to establish that the income tax should be admitted as an item of operating expense and that the profits of a subsidiary company (non-utility) should accrue to the benefit of the stockholders and not the consumers. These points also mean much to the utilities.

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Order Based on Conjecture Brings Court Rebuke

"CRITICISM should be fortified with convincing evidence when charges are made of inefficient and wasteful management." This pointed rebuke to the Illinois Commerce Commission was contained in the decision of two judges of the United States District Court in sustaining an injunction against enforcement of a 5-cent fare order on the Chicago Surface Lines. This decision was outlined in last week's issue. The 5-cent fare ruling of the commission had been discounted in advance as the mere carrying out of a campaign pledge of the new State administration. The opinion of the federal judges was therefore no surprise to those familiar with the Chicago situation, though many doubted that the commission would have the audacity so to ignore the law and the evidence. The court finding means, in brief, that confiscation of property will not be tolerated and that a rate reduction ordered arbitrarily without due investigation of conditions of the utility in question cannot be approved.

Suggested changes based on "conjecture and opinion" will not hold, said the court. "Orderly, rational and legal methods of procedure" must be followed in fixing rates, though the court seemingly tried to find an excuse for the action of the commission in its statement that a "commission will always be forgiven if its enthusiasm (in the interest of the people) leads it to incidental legal excesses. It cannot, however, act arbitrarily to force its views without trial." Fare orders must be based on evidence or sustaining truths, and where the record on review before the court shows that the plaintiff's operating costs compare favorably with those of other companies of like nature, it cannot fairly be accused of inefficiency.

An interesting angle of the Chicago Surface Lines case was the attempt of the commission to regulate the service by fixing the rates of fare charged therefor. The court held this to be an improper exercise of authority, saying the commission should have ordered whatever changes in its opinion were proper and suggested the rate after the various reforms had been found possible of execution. The mere opinion of a commission that a certain kind of medicine will be good for the patient cannot be accepted without proof.

The federal judges also scorned the contention of the city's lawyers that a minor return to the stockholders of today is enough because their predecessors secured large returns. The court made clear that there is no connection between past and present, as presumably the more fortunate investors of earlier years have since unloaded their holdings and the less fortunate present holders should not be made to suffer.

Similar treatment was given by the court to the suggestion that a large saving in operating expenses should be made by eliminating the provision for renewals and depreciation. "The right to set aside a depreciation fund is a property right created for the benefit of the complainants (railways) and cannot be taken away by the state without their consent or due compensation made therefor," said the judges. This, too, is sound common sense.

The decision in the Surface Lines case may serve a good purpose as an object lesson for "political" commissions everywhere, and locally in steering the members of the new Illinois Commerce Commission into proper channels of reasoning. They have already discovered—if they did not know before—that investors in public utilities have their property rights which must be respected. The way is not foreclosed to reduction of rates if these rates are found to be excessive, but the new rates must not be punitive nor can it be a matter of unprincipled political caprice. Sanction of a confiscatory rate would harm the public dependent upon the utility for service as well as the investor whose money is at stake.

Utility commissions have their useful functions, but it is good to note that the federal court was prompt to recognize the abuse of authority and properly rebuke the offenders. In its more recent workings, the commission has been noticeably more cautious and has taken pains to have its utterances well grounded.

No Immunity for the Railway Companies

AN ELECTRIC railway company cannot turn state's evidence, run to its mother, hide its head in the sand or do the other things erring animals do to escape punishment. No, every error of a public utility results in a sentence to the public pillory. It is difficult to forgive an intangible inhuman mechanism that depends on public donations for support when it gets into trouble. It has no smile or laughing eyes or pleading voice to create sympathy and it may create a public sentiment that is "sharper than a serpent's tooth" when angered.

Public utilities have excellent executives, and they seldom if ever purposely attempt to anger the public, but who can gage the mob spirit? Errors in policy will always occur and it is absolutely essential that the initial attitude of the public should be favorable and not unfavorable to the utility.

If the personality of the company could be focussed into the form of a charming young lady, what public jury would convict? If tears, beguiling eyes, seductive form and pleading words could only represent a street railway, what miracles would occur? Or if only the pre-war "Bill Kaiser" could personify the utility, what a relief it would be to have the public shouting "the King can do no wrong." But why dream of the impossible and of the past when a real crisis is at hand?

But the railways can do things to help swing the public to them; they can merge the company personality into one man, who, above and beyond all other duties, must be one of the mob and must interpret for and to it all items in connection with street railways. Few street railways have executives who have the personality or the time to devote themselves to public relations and most permit statements to reach the public from two or more sources in the organization. This is the reason for the appointment of an official whose principal duty is to see that the public is satisfied with the service, whether his title is manager of public relations, sales manager or what not. Where this work can be done by the chief executive officer it is better, but that is not essential. Of course it takes brains, personality and a frank, straightforward policy to get away with such a job, but it is a necessary move if the public is to be kept in a sympathetic frame of mind.

Such a man can do more to "sell" the company than a million pages of advertising. All most railways need is a good salesman and a showroom instead of so many men and women who are so much engrossed in their own duties that they are almost inaccessible and seem ofttimes quite unapproachable.

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Rolling Girder Rails

The Author Describes the Various Rolling Mill Processes Incidental to Rolling Girder Rails—Essential Difference in Rolling T-Rails and Girder Rails Discussed — Some Reasons Given for Cost Differences and Recent Developments Outlined

BY R. C. CRAM
Engineer Surface Roadway Brooklyn (N. Y.) Rapid Transit Company

IN A PREVIOUS article on the history and development of electric railway rails the writer attempted to outline the theory and practice which led up to the rails as we know them today. The subject of rails is so broad that there remain quite a few matters relating to them which will bear discussion and some of them will be treated in this article.

A knowledge of the methods of manufacture of any material is always useful when an attempt is made to apply that material to a definite service. Hence an outline of the manufacturing procedure in rails should be of some interest.

It may not be out of place in discussing steel rails to refresh our minds as to what steel is. We are very likely to forget the fact that it is really refined iron because most chemical analyses of steels neglect to include the iron content and give only the percentages of the other or remaining elements. Steel contains usually about 98 per cent iron, with the remaining 2 per cent divided principally among the elements of carbon, manganese, silicon, phosphorus and sulphur. Occasionally traces of copper and arsenic may be present. With the exception of iron, carbon may be considered the most important element.

Principally because varying grades or degrees of hardness and ductility are obtained by varying the proportions of the carbon, manganese, silicon and phosphorus, the iron content is omitted and rather taken for granted in rail-steel analyses. Similarly, by adding certain alloys such as manganese, vanadium, chromium or

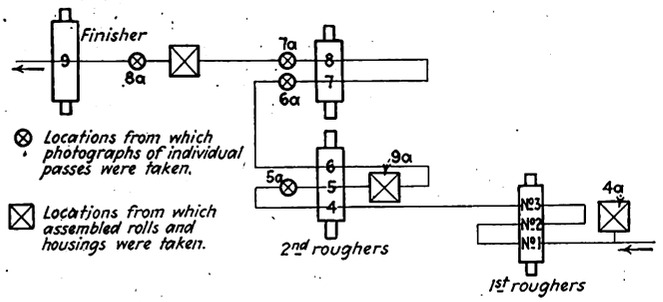
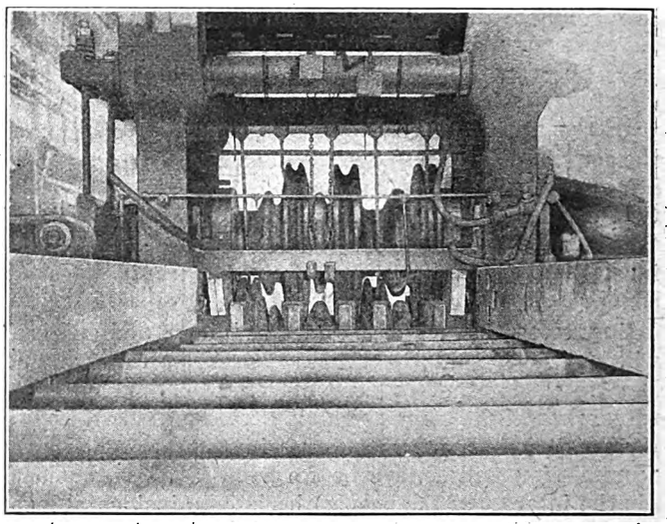


FIG. 1—DIAGRAM SHOWING ROUTE OF BLOOM AND RAIL BETWEEN BLOOMING MILL AND FINISHING MILL



IN THESE FIRST ROUGHING ROLLS THE RAILS GET THEIR PRELIMINARY FORMATION. (TAKEN FROM POINT 4A, FIG. 1)

nickel the properties of the steel may be changed, and steels to which these alloys have been purposely added are called alloy steels and take their names from the particular element thus added, viz., vanadium steel, chromium steel, silicon steel, nickel steel and manganese steel. These terms serve to distinguish the steel from ordinary or carbon steel, from which rails are usually rolled.

The use of alloy steels for street railway rails has never gained much favor, except in the case of manganese steel, which has obtained a wide use for special trackwork wherein the rails are subjected to extraordinary wear. Titanium treated steel has been used to a considerable extent, but titanium is not considered as an alloy since it is almost impossible to find it in an analysis of finished rail steel to which it has been added. As a rule, alloy steels are more expensive than ordinary rail steel, and this fact, combined with the doubtful value of the results so far obtained from their use, has prevented their general adoption.

The whole process of making the rail steel cannot be

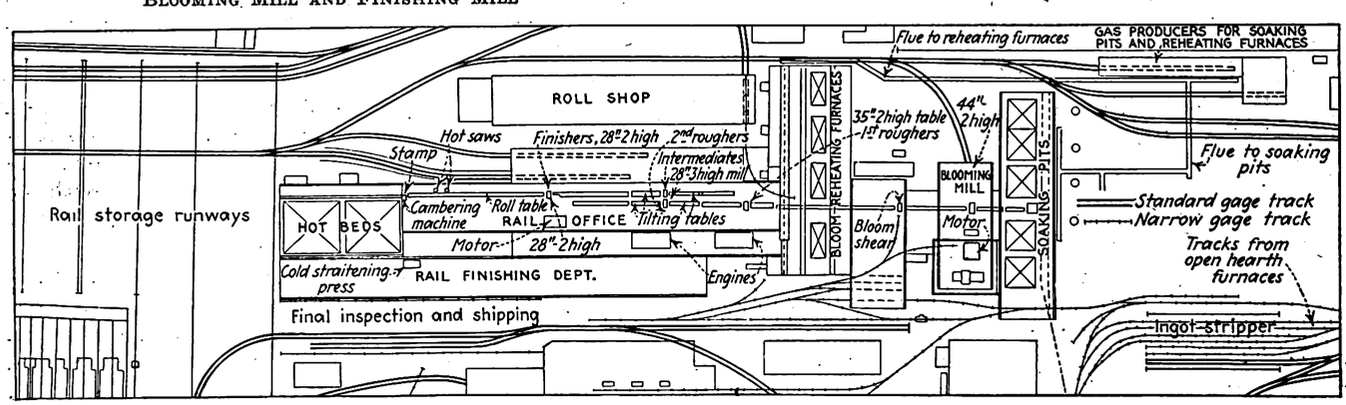


FIG. 2—GENERAL LAYOUT OF TYPICAL RAIL MILL, SCALE APPROXIMATELY 335 FT. TO THE INCH

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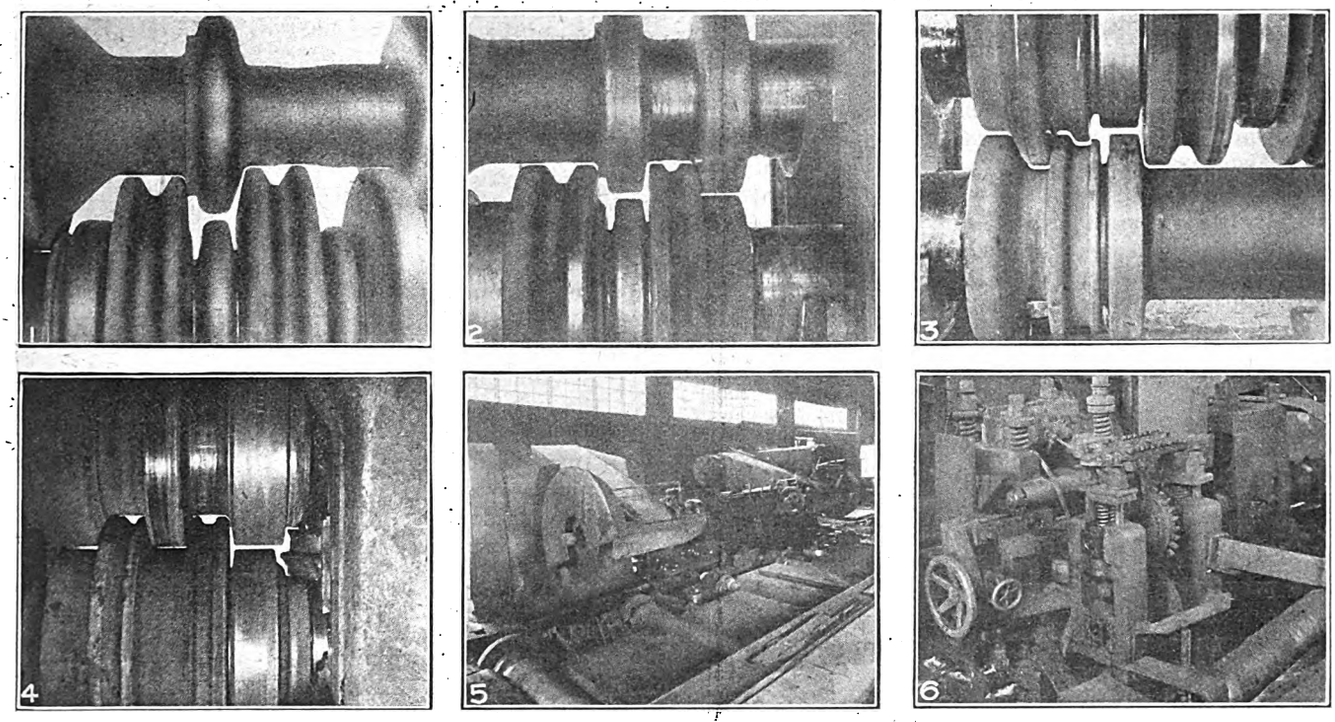
described within the limits of this article, which aims principally to describe rolling mill processes rather than steel-making. It is now generally known that rails are made principally of open-hearth steel, in contrast to earlier practice of using bessemer steel. This change has come about through the increasing scarcity of low-phosphorus ores and because the bessemer process of steel making does not eliminate phosphorus. Phosphorus is one of the most troublesome elements because it hardens steel more rapidly than does either carbon or silicon and it renders steel brittle by increasing the hardness and decreasing the toughness. High phosphorus in conjunction with high carbon renders steel "cold short," which means that it is brittle when cold.

Elements of a Rolling Mill

Rails are produced in rolling mills. Rolling is the operation of reducing the section of pieces of metal by passing them between revolving cylinders called rolls.



SOME OF THE ROLLING-MILL EQUIPMENT USED IN MAKING RAILS

No. 1—Assembled rolls for fifth pass in second roughers. Tram beginning to take form. (Taken from point 5a, Fig. 1.)

No. 2—Intermediate rolls in which tram and head are shaped further. (Taken from point 6a, Fig. 1.)

No. 3—Eighth pass through intermediate rolls, in which head is beveled and base shaped further. (Taken from point 7a, Fig. 1.)

No. 4—Finishing rolls, ninth pass, in which groove is formed by idler roll and maker's imprint is added. (Taken from point 8a, Fig. 1.)

No. 5—Hot saws by means of which rails are cut to length.

No. 6—Numbering machine which stamps heat numbers on rail base.

A rolling mill consists essentially of the rolls set in a framework, called a "housing," and connected with an engine by pinions and spindles. Rolls are almost always made of steel, cast to rough shape and then turned down to exact size. The preparation of a set of rolls is a costly process. However, cast iron rolls are generally used for the finishing rolls. Rolls and housings are shown in the accompanying illustrations. The enormous size of some rolls is indicated in the several views. A set of rolls and their housing is called a "stand" and two or more stands connected together a "train."

The rails pass from one stand to another upon roll tables which are shown in one of the illustrations. These tables consist of long series of rolls which are operated by power and the rails pass on top of them from one stand to another in the rolling train. The tilting tables used with three-high mills are so arranged that they may move laterally as well as vertically in order that the rails may be transferred from pass to pass without loss of time.

Preparing Ingots for Rolling

The pig iron produced by the refining of iron ores is mixed with scrap, melted and further refined in open hearth furnaces of either the stationary or tilting types. This refined product of the open hearth furnaces, which is now steel, is tapped (or drawn) into ladles, which are conveyed by a traveling crane away from the furnace and the metal is teemed (poured) into ingot molds. A "heat" is the particular furnace charge from which the ingots are poured and from two to seven ingots are poured from a bessemer furnace, while twenty or more are obtained from open-hearth furnaces. The "heat" number of the ingots is always marked on the rails, while still hot, by a stamping machine, shown in an accompanying illustration. This is done just after the rails are sawed to length for the purpose of identification. As soon as the metal has cooled sufficiently to solidify, the ingot is removed or "stripped" from the mold by stripping machines (strippers) and placed in a "soaking pit," which is a vertical heating furnace whose top is below the floor level, where it is kept at a temperature of from 2,100 to 2,200 deg. F. This is done in order to allow the temperature of the ingot to become equalized. The ingots are kept in a vertical position in the soaking pits in order to have the "pipe" remain at the top. The ingots range in size from 13 x 19 in. to 23 x 29 in. at the bottom and the height varies from 67 to 82 in. The height of the ingot is varied (poured down) when the metal is teemed into the mold to suit the rail that is to be rolled. Ingots for girder rails weigh about 9,800 lb.

The treatment which the metal gets during the manu-

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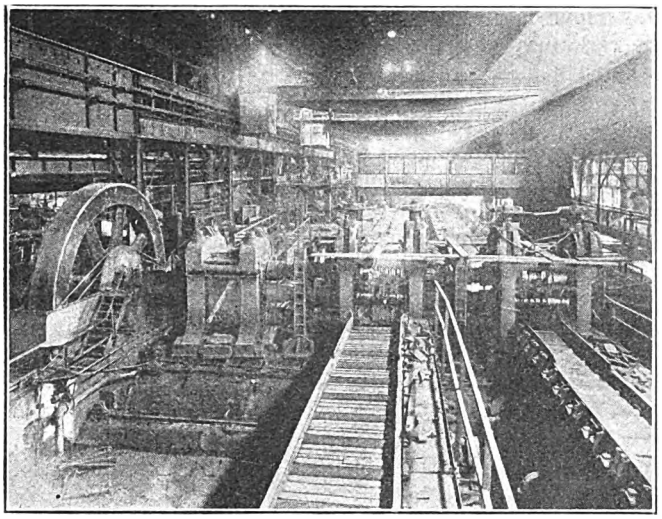
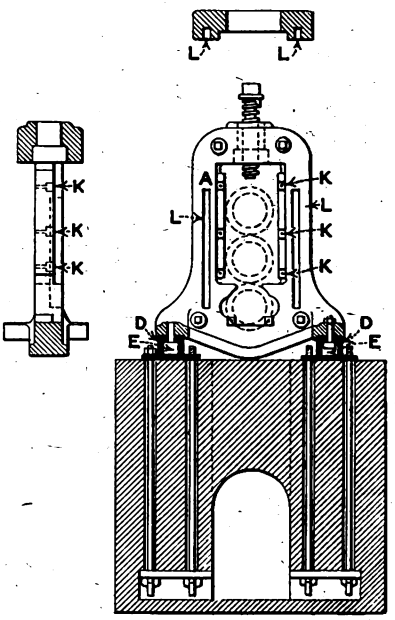


THREE-HIGH ROUGHERS AND INTERMEDIATE ROLLS—DRIVING ENGINES AND GEARING AT LEFT, ROLL TABLES IN FOREGROUND AND BACKGROUND. (TAKEN FROM POINT 9A, FIG. 1)

facturing process is thought by many to be of even greater importance than the chemical composition. Dr. C. B. Dudley stated in a report to the Iron and Steel Institute in 1890 that sound ingots were of the utmost importance, and the more recent research work by the metallurgists of the American Railway Engineering Association, the Bureau of Standards and the Interstate Commerce Commission has been directed toward the improvement of practices which will insure the production of sound ingots. Undoubtedly the most serious defects in rails develop from this source. Steel contains impurities which solidify at lower temperatures than metallic iron. The impurities tend gradually to segregate from the iron and concentrate in the hottest parts of the ingot, which are at the center and top. Unsoundness may also be due to improper mixing of the molten metal. While it is possible to produce sound ingots, the ordinary method of casting them usually results in a large proportion of unsound metal at the top which often extends all through it. When this happens, the unsound portions are apt to get into the finished rails.

When needed, the ingot is taken from the soaking pit, cropped (cut) by heavy gear-driven shears to discard unsound metal and rolled into blooms (large sized bars), in a blooming mill, where by successive passes through blooming rolls it is reduced to a shape section similar to that required for I-beams and channels. This section has an area about equal to an 8-in. x 8-in. square and the blooms range from 15 to 24 ft. in length. The bar or bloom as rolled is cut or cropped sufficiently to remove all unsound material and is then cut into several blooms whose lengths are determined by the length and weight of the rail to be rolled. The blooms are then recharged in reheating furnaces, where they are again brought to a temperature of about 2,200 deg. F. This temperature varies somewhat with different mills and the reheating is done mainly to restore heat which has been lost in the blooming process.

From the reheating furnace the blooms begin their travel on the roll tables to the rail mill, where they pass through two "stands" of roughing and a "stand" of intermediate rolls which approximately shape the rail. Each "pass" through a "stand" of rolls changes the shape of the bloom more and more into a form approaching that of the finished rail. From the intermediate rolls the rail goes to the finishing rolls (finishing stand), which give the rail its final or finished section. These rolls also form the raised markings such as the maker's name, date, weight and section number upon the rails which appear slightly raised in letters and figures upon the web. Until recently it was believed that the finishing temperatures affected the mechanical properties of the rail, but experiments have proved that such temperatures have little influence on the wear of rails. A more important factor is to have the rail head secure a maximum amount of work during rolling.

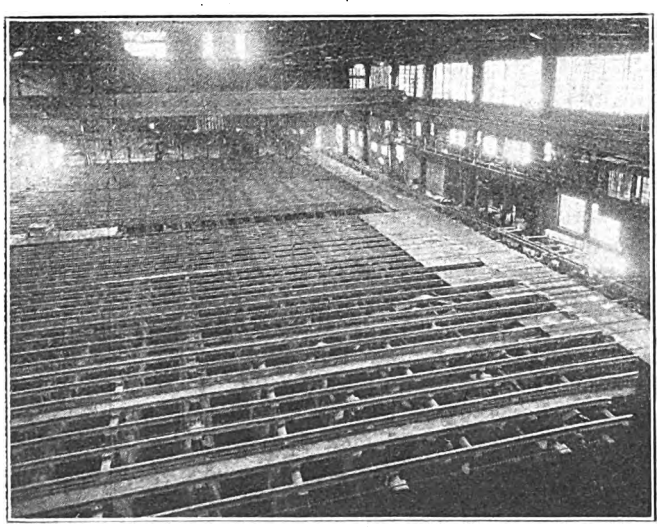


TYPICAL ROLL HOUSING FOR THREE-HIGH MILL

A, housing casting; *DD*, base rails; *EE*, slots for boltheads; *K* and *L* serve to identify points on section drawings.

The rail then goes to the "hot" saws (so called because they cut the hot rails and to distinguish these saws from "cold" saws used for cutting cold metals), where it is cut usually to a length of 62 ft. as 30-ft. lengths are now seldom specified for girder rails. Girder guard rails, however, are still cut to 30 ft., principally to facilitate their later bending for use in curves. The temperature of the rail has been reduced to about 1,700 deg. F. by the time it reached the saws. The hot saws are shown in one of the illustrations.

The hot rails now go on to the stamping machine, where the heat numbers are put on the base at one end and clear of the space occupied by joint plates. Following this operation, the rail passes to the cambering machine, where it is given a camber of 6 in. or more, depending upon the distribution of the metal in cross-section. Cambering is a very important operation. After this the rail goes to the cooling beds (hot beds) shown in the illustration, when the camber disappears as the rail cools to normal temperature. When cooled the rail goes to the cold-straightening press, where any



HOT BEDS WHERE RAILS ARE ALLOWED TO COOL AND STRAIGHTEN—ROLL TABLE AT RIGHT

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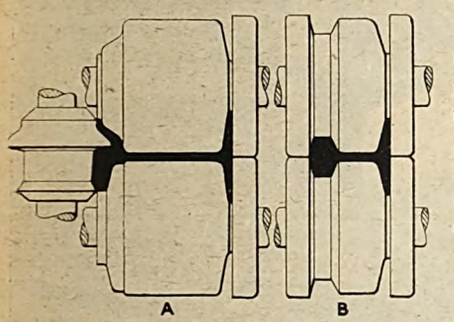
kinks are taken out. Girder rails sometimes receive severe treatment in this press and it is believed that they receive a test here which serves about as well as the drop test in the determination of most of the physical properties. Very few girder rails ever fail in the drop test if they have successfully passed the cold-straightening press.

The rail then goes to the ending machine, where the ends are made true. Following this the bolt holes and tie-rod holes are drilled and the rail is then placed on the inspection and shipping platform.

GIRDER GROOVED RAILS REQUIRE VERTICAL ROLLS

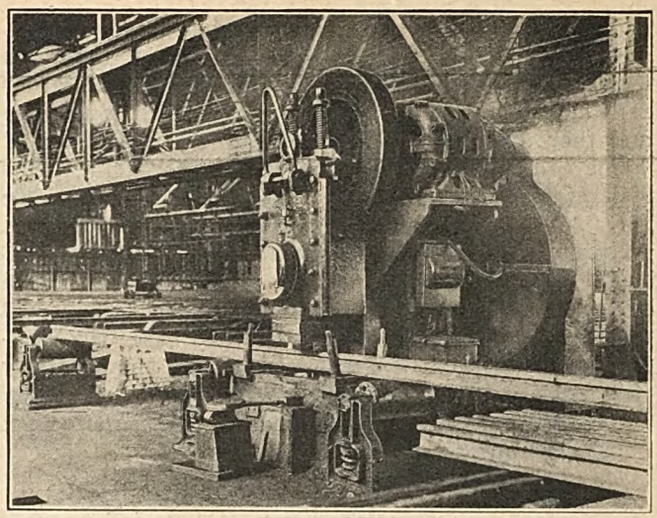
There are but two mills in this country which are equipped to roll girder grooved and girder guard rails. The process in the rail mill proper is somewhat different from that for rolling standard (T-rail) sections. Girder rails may be rolled in what is called a "two-high" reversing mill, where the rails are transferred from one pass to another, the rotation of the rolls being reversed between passes. "Three-high" mills are also used, in which case there are three rolls in a stand, as shown in one of the illustrations. After passage between the two lower of the three rolls the rails are raised on a "tilting table" and passed between the two upper rolls, the middle rolls being used in common for each pass. In the three-high mill it is not necessary to use reversing engines. It will be noted from an accompanying illustration that three rolls, one of which is vertical, are necessary for finishing girder grooved, girder tram and girder guard rails, while but two horizontal rolls are required for T-rails. This is because it was found impossible to form the peculiar head and groove contours with ordinary rolls so that there would be a reasonable uniformity of section. Hence the vertical roll (side roll or idler roll) was introduced, and this successfully solved the problem, so that a remarkable conformity with the template is now obtained.



CROSS-SECTIONS OF RAILS IN ROLLS—A, GIRDER RAIL; B, T-RAIL

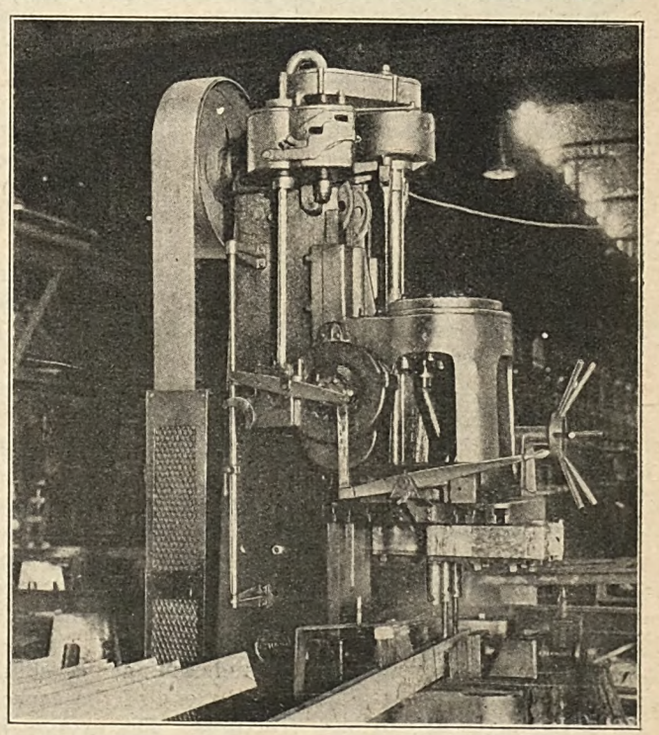
There are two friction-driven vertical rolls used, one in the final pass at one end of the horizontal rolls and one in the preceding or leader pass at the other end of the horizontal rolls. It would be impossible to roll some sections now required without these vertical rolls, which are principally for forming the tram or groove. One rail mill forms the groove by rolling a lip projecting about at right angles to the rail and bending it up to proper form in the final passes. The other mill forms the groove by constantly rolling the head and lip in a mass and forming the groove by pressing it out (or "guttering" as it is called) by means of the idler roll in the final passes. The first method is a bending and forming operation, while the second is more of a pressing operation. Both rail mills use the first method for forming guard rail sections.

There are a number of reasons why girder rails cost more than ordinary standard section (low-T) rails. More rolls are required and nearly all of these must be changed, for each change in section, from the start of the blooming mill to the finishing rolls. This takes time and the rolls are expensive. Tonnages for each section are usually small and the "run" or time expended is comparatively short, entailing frequent shut-downs for roll changes. It is said that the production of a rail mill working on girder rails is 50 per cent less than when working on standard section (low-T) rails.


COLD-STRAIGHTENING PRESS, WHERE THE LAST KINKS ARE REMOVED FROM THE RAILS—HOT BEDS IN THE BACKGROUND

Girder rails require special shape blooming rolls, while standard section (T-rails) rails are rolled from ordinary square blooms and the same set of blooming rolls may be used for many different T-rail sections. Thus the blooming mill may be run at 100 per cent capacity, which is not so when roll changes are required for girder rails. It is necessary to reheat the blooms for girder rails, while low T-rails are usually rolled direct from the initial heat of the ingot.

Furthermore, the entering pass is slower on the special shape blooms, which reduces the capacity of the blooming mill. Girder rails are always rolled in 60-ft. lengths, which increases costs for finishing, straighten-


MULTIPLE-SPINDLE MACHINE FOR DRILLING BOLT HOLES

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ing and handling, and this length causes greater loss in scrap rails due to short lengths caused by minimum lengths of 40 ft. allowed by specifications. All girder rails have their ends milled square in an ending machine and they are frequently drilled for tie rods, both of which add further to the cost. Of the foregoing items it is stated that the 60-ft. length alone is responsible for a $5 cost increase over the cost for 30-ft. rails even when 60-ft. lengths are required for low T-rails.

The great variety in number of sections still called for by the street railways, combined with the unequal distribution of metal between head and base; the peculiar head and groove contours and the comparatively thin webs and bases are other factors which contribute in no small measure to the higher cost of manufacture of girder rails.

Recent Developments in Manufacturing Processes

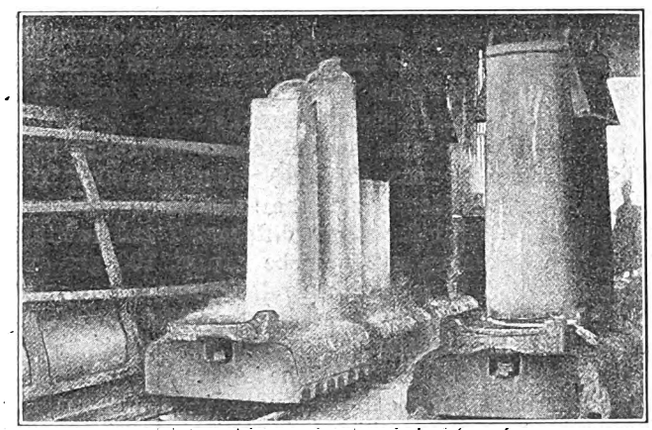
In Great Britain there has been a considerable use of silicon steel or "Sandberg" silicon rails for tramway purposes. This steel is made by the bessemer process and it is high in silicon content, which ranges at about 0.315 per cent. Sandberg has introduced a new process whereby the steel is cooled by air jets through the critical range in temperatures, producing a sorbitic structure. It is claimed that an increased durability of from 100 to 200 per cent has been shown in rails of this kind during a test period of one year, and that so far no indications of corrugation are found. The Bethlehem Steel Company is now introducing this process in this country.

The Sandberg people also introduced a process (called "in-situ") for heat treating rail heads in tracks in place for the purpose of hardening them and increasing their life. It is stated that the results of this process as used on the Croyden Tramways in England for a year and a half showed no signs of corrugation. A similar process for hardening rails in special trackwork has been tried in San Francisco.

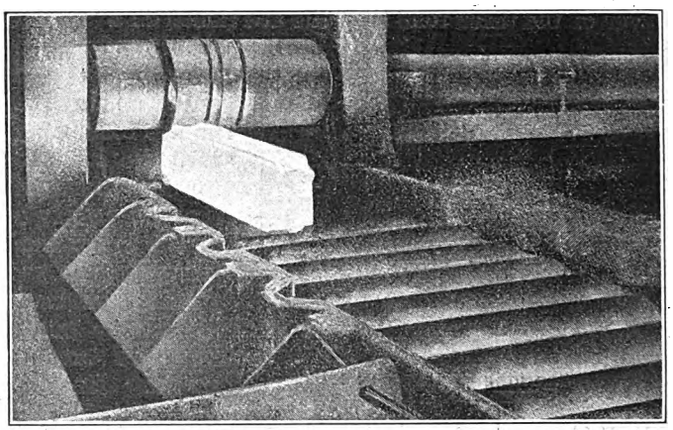
Another manufacturing improvement of note is the so-called deseaming process introduced by the Lackawanna Steel Company. By means of a specially designed milling machine the comparatively soft surface metal is removed as a part of the movement of the rails through the rolling trains, leaving the harder interior metal for the final rolling passes and eliminating "skin" cracks, which have been found to be one of the causes of rail failures due to base fractures. The process is so far applicable only to standard section rails (low T-rails) and it has not been found feasible up to the present time to introduce the method in the manufacture of girder rails.

One rail mill has recently introduced the use of the vertical or idler-roll for plain girder (high-T) rails. This is to eliminate roughness frequently observed on the top of the heads of standard section (low-T) rails. The tops of rails so rolled have a uniform, clean surface, and the thought is expressed that this should have some tendency toward preventing corrugation.

Most of these advances in the art tend to indicate the desirability of increasing the hardness of rail steel for electric railway work to as high a degree as possible, but without too great sacrifice of ductility. The high-carbon steel now used in girder rails has not proved detrimental where the rails are installed in pavements. Very few breakages occur and these are not dangerous, because the pavements hold the rails in place and tend to prevent any serious results, such as derailments or equipment damage. There remains some question as to what the carbon content should be for rails which are to be used with certain forms of welded rail joints.



Ingots and Ingot Molds on Way to and from Stripper



Incandescent Ingot Entering First Pass in Blooming Rolls

The writer desires to acknowledge the assistance rendered by G. C. Farkell and N. E. Salsich in furnishing data and revising and correcting this article. His thanks are also due to the Bethlehem Steel Company for the photographs of mill processes which are used for illustrative purposes. These were taken especially for this use and some of them were obtained with considerable difficulty.

Report on Unemployment Problem Issued

THE National Industrial Conference Board has just issued a report on the unemployment problem, which makes a brief but comprehensive survey of unemployment during normal periods and during a certain business depression, discusses the causes and analyzes the remedies that have been suggested. The report estimates the total number of persons engaged in gainful occupations in the United States in 1920 was about 41,000,000 and that of this number 12,800,000 are wage earners. In normal times, it is believed, an average of about 14 per cent of total working time is lost by each industrial wage earner, due to sickness and other causes, but not including loss from part time employment, for which no reliable figures are to be had. This corresponds to an average number of 1,800,000 people out of work. The report estimates that on June 1, 1921, over one-quarter of the wage earners, or 3,500,000 persons, were out of work.

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Why Modern Motors Should Supersede Older Types

Self-Ventilation, Together with the Use of Commutating Poles, Box Type Frames, Bronze Bearings and Improvements in Mechanical and Electrical Design, Has Produced a Motor for Present Day Service

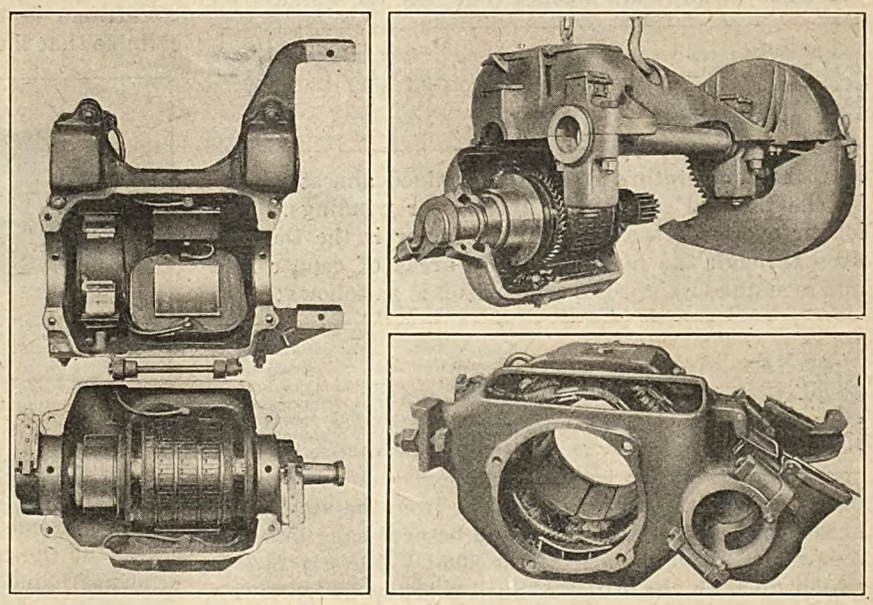
BY J. M. HIPPLE
Manager Railway Motor Engineering Design,
Westinghouse Electric & Manufacturing Company

IT IS quite customary, both in business and personal affairs, to cling to a certain article even after it has been supplanted in public use by something more efficient and modern. Because the old article was once found to meet our particular conditions, we fail to analyze the cost of continuing its use as compared with something more modern and probably better suited to our changed requirements. That is what often happens in the selection of railway motors, and for this reason the writer believes that it will be of interest to study the following facts comparing an older but popular type of motor with more modern types and to show why the modern motor is superior.

At the time of the introduction of the Westinghouse 101-B-2 motor maintenance costs were increasing rapidly because the construction of existing motors failed to meet the increased service requirements. Compared with previous motors, the 101-B-2 was heavier and more rugged, oil and waste lubrication supplanted grease and the windings were better protected and better insulated. With the exception of vent plates, the motor was fully inclosed with split frame and without commutating poles. The result was that on its service record this motor won many friends, some of whom had been loath to give it up even for more modern equipment.

There has even been some disappointment in the results obtained from the operation of the modern ventilated box frame commutating pole motor as compared with the continued good performance of the 101-B-2, especially on properties where the split frame construction has been well maintained. This has been due, largely, to special conditions among which are: (1) The lighter mechanical construction of the modern ventilated motor, for a given electrical rating, due to causes that are discussed in the following paragraphs: (2) the selection or application of these motors based on their continuous electrical capacity or rating without sufficient consideration having been given to their thermal capacity and mechanical capacity; (3) the workmanship and materials for a period during the war falling far below the pre-war standards, so that some of the modern motors suffered unjustly as a result of this temporary condition.

In a railway motor there are, aside from mechanical construction, two considerations that, from a heating standpoint, govern its ability to perform a given service. One is its inherent thermal capacity and the other its continuous capacity at a reduced voltage. The thermal capacity determines its ability to carry short time peak loads and the continuous capacity indicates its ability to perform a given all-day service. In comparing any two motors as to capacity, it is, therefore, essential to evaluate both these characteristics with reference to the service requirements. The standard types of motors now in general and satisfactory use are of the ventilated type, having an internal blower that draws in air, circulates and discharges it to the outside, as distinguished from the inclosed motors that have no air inlets or outlets. Such motors, of a given physical size, have higher continuous capacity than the inclosed motors of the same size because of the heat that is carried away by the ventilating air.



AT LEFT, NO. 101-B-2 SPLIT FRAME MOTOR WITH HOUSING OPEN. AT RIGHT, TOP, NO. 38-B RAILWAY MOTOR WITH HOUSING OPEN, SHOWING CROSS LUBRICATION. AT RIGHT, BOTTOM, NO. 532-B MOTOR HOUSING

There are only two ways to dissipate the heat resulting from the motor losses, one is by radiation from the frame and the other by means of air passing through the machine. In the inclosed motor, except for the effect of slight air leakage, all the heat resulting from the losses must be dissipated from the frame by radiation. In the ventilated motor, at the continuous rating, as high as 65 per cent of the losses may be dissipated by the ventilating air, thereby giving a direct gain in capacity or a permissible reduction in size.

The practical result is that in a given service a lighter motor may be used provided the lower thermal capacity of the smaller motor is not a limit. In general, in both city and suburban service these lighter motors do meet the service requirements where formerly the heavier inclosed motor was used, and of course give a very considerable saving both in first cost and in reduced weight of car equipment. For instance, on a car where formerly the 101-B-2 would have been used, it is now

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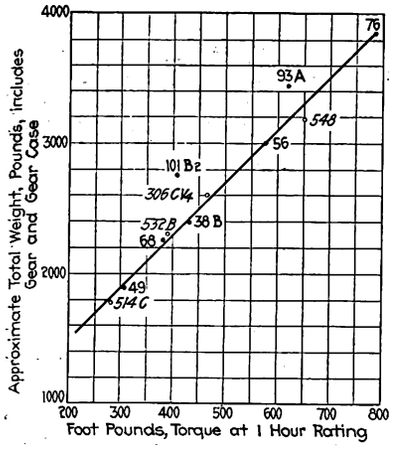


RELATION BETWEEN TORQUE AND TOTAL WEIGHT FOR OLD AND RECENT RAILWAY MOTORS

found to be feasible to use the Westinghouse type 532-B or even, possibly, the type 514-C. By total weight of motors and gears, the comparison is shown in the accompanying table. If, however, the user of 101-B-2 motors desires to duplicate that motor in a modern commutating pole motor, as to thermal characteristics, it will be necessary to select a motor of approximately the same weight and cost as the old motor. The total weight of the motor is a rough indication of thermal capacity, but a better convenient check is the size of copper in motors of the same speed. For overloads lasting only a short time, say ten minutes or

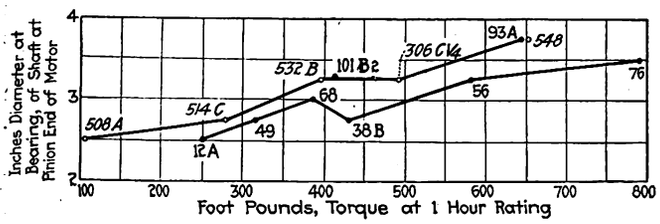
Hour Rating	Type	Weight, Pounds
40 hp. 500 volts, 520 r.p.m.	101-B-2	2,780
65 hp. 600 volts, 700 r.p.m.	306-CV-4	2,700
50 hp. 600 volts, 665 r.p.m.	532-B	2,325
40 hp. 600 volts, 760 r.p.m.	514-C	1,770

less, the temperature rise is determined almost wholly by the thermal capacity of the copper windings. For longer overloads the determining factor is the thermal drop through the insulation. By areas of copper size and armature weight the comparison is as follows:

Type Motor	Copper Area, Circular Mils	Armature Weight, Pounds
101-B-2	13,000 approximately	585 approximately
306-CV-4	16,600 approximately	615 approximately
307	13,000 approximately	615 approximately
532-B	10,400 approximately	550 approximately
514-C	7,420 approximately	390 approximately

It is evident from this table that from the standpoint of thermal capacity only it would be necessary to select a motor of about the size of the 306-CV-4 or the 307 to match up with the 101-B-2. Such a heavy motor is undoubtedly better able to stand heavy short overloads without injurious heating than are the lighter motors, but the user pays for this capacity both in first cost and in operating cost.

The use of the wholly inclosed motor, as explained above, resulted in the use of a relatively large motor

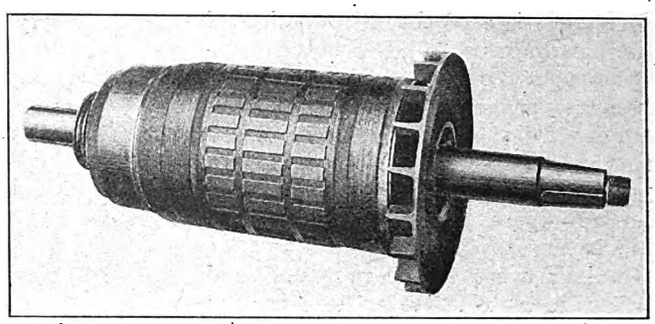


FOOT-POUNDS TORQUE AT ONE-HOUR RATING, SHOWING EFFECT OF VENTILATION ON WEIGHT

and one in which the commutating conditions were very favorable during the greater part of the cycle of operation. At the hour rating or at heavier loads the sparking was often very severe, even vicious, but a good commutator surface resulted from the motor being large in proportion to its continuous rating and from the effects of the periods of coasting. The use of the commutating pole, which had been introduced three or four years earlier than the ventilated motor, made it possible to get just as good or even better commutating conditions with these lighter motors than with the heavier non-commutating pole type. If, however, the older types of motors should be ventilated and then be applied up to their limit of heating, it is quite certain that the commutation would be very poor and would in the end set the limit of capacity.

BOX FRAME RESULTED IN IMPROVED MAINTENANCE METHODS

The introduction of the box type frame for railway motors came first on the large motors of 100 hp. and upward. The reason for this was that it was found to be practically impossible to get satisfactory operation from split frame motors in these sizes due to slight movement between the frame halves and the bearing housings, which resulted in relatively rapid wear. This movement was due in part to lack of rigidity in the whole structure, but mainly to the difficulty of maintaining the bolts tight enough to insure the proper clamping effect. The improvement resulting from the use of the box frame in the sizes was so great that it was inevitable that the same construction would be tried on the



ARMATURE OF NO. 532-B RAILWAY MOTOR, SHOWING CONSTRUCTION OF FAN

smaller sizes, where the same difficulty of wear between housings and frame halves was causing considerable trouble. Some difference of opinion as to the desirability of the box construction in these sizes naturally developed, since at first consideration it appeared that such motors would be much less accessible for repairs as compared with the split frame motors where the lower half of the frame could be swung down into the car pit so as to permit the removal of armatures and field coils without removing the motor from the trucks.

Actual experience, however, has shown that with proper equipment for lifting the car body from the trucks and for handling the motor the use of the box frame motor has, in reality, brought about marked improvements in maintenance methods. Carhouse equipment is now provided whereby the entire motor is easily lifted out and put in the shop, where working conditions are very much better than in a dark pit. The improved operation resulting from the use of the box frame motor has led to its adoption as the practically universal standard.

It is interesting to note the relative weight of motors of designs produced at different periods. The 101-B-2 motor followed the 68, and was followed by the 306 and 307 motors, which were followed in their turn by the ventilated type motors, 532-B, 306-CV-4, 548, etc. From the graphs showing the relation between torque at the one-hour rating and total weight including gears and gear cases it is seen that the old line of motors, 49, 38-B,

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56, 68, and 76 fall in a straight line curve. The 93-A and 101-B-2, coming after a period of mechanical troubles with the older motors and at a time when a reduction in troubles was due, swung well away from this straight line. The increased total weight resulted from the heavier shaft, frame and all mechanical parts. The later ventilated motors, although maintaining much the same rugged mechanical construction, swung back again on the straight line, showing the effect of the ventilation in the weight, even at the one-hour rating, as well as of refinements in design. The graphs showing the relation between diameter of pinion and shaft bearing and torque indicate that no sacrifice was made in the shaft and bearing diameter in the present standard motors. These show also that the 101-B-2 was the pioneer in providing "oversize" shafts.

The production of motors that are sufficiently rugged to stand up under the severe modern service conditions and yet that weigh no more per foot-pound torque than the older motors that proved inadequate as service conditions increased is the result of many factors. The effect of ventilation, the commutating pole and the box frame mentioned above has been supplemented by a more exact knowledge of the possibilities of electrical design, improvement in mechanical details, the use of bronze bearings instead of cast or malleable iron and wonderful improvements in gear and pinion materials.

It thus appears that the 101-B-2 motor was in its day a distinct achievement, and a recognition of the greatly increased duty requirements, but the ventilated, commutating-pole type motors that have superseded it represent just as great an achievement because of their equally rugged mechanical construction, their reduced first cost and their reduced operating cost.

Notes on Swiss Heavy Traction Development

British Traveler in Switzerland Studies Present Status of Electrification in Manufacturers' Plants and on Operating Properties and Reports His Observations

AT THE request of the editor of the *Electrician*, London, Dr. S. P. Smith has recently written out for that paper some of the things which he noted in a tour of observation through Switzerland. Among his observations regarding heavy traction were these:

At the Oerlikon Works there was in the shops such a preponderance of locomotive construction under way that all other work seemed negligible in comparison. Many freight locomotives for the St. Gothard Railway were being built. There were in the shops a number of locomotive drivers sent by the Federal Railway Administration for training, to prepare them to operate these locomotives later. It was evident also that the compensated series motor with phase-displaced commutating field, introduced for traction by Dr. Behn-Eschenburg many years ago, is popular for single-phase railways.

In the shops also were giant waterwheel alternators of low frequency (16⅔ cycle) and transformers for the Federal Railways, as well as a three-phase motor coach for the Burgdorf-Thun Railway. A 1,500-volt, 50-cycle rotary converter for traction work was also noted.

At the Baden Works of the Brown-Boveri Company the shops were also filled with work for the Swiss Federal Railways. The observer was interested in the robustness of construction of the locomotives and the plan used for cooling the transformers. The latter are placed in strong tanks through which oil is pumped, while the oil is cooled in pipes placed along the outside of the locomotive cab or in a cooler operated by a fan. He noted also the differences between the Oerlikon and Brown-Boveri single-phase traction motors. In the former there are no resistance connectors between the armature winding and the commutator segments, whereas such connectors are used in the Brown-Boveri motor. The resistance connectors in the latter motor are not placed in the slots as in earlier machines, but between the segments and the coils to insure cooling. The object in reverting to the use of these connectors is to give greater freedom in design. Wave rather than lap windings are used on the armatures.

As to the St. Gothard Railway, Dr. Smith said that electric traction has made a great difference on this line. Instead of three steam locomotives, two electrics haul the express trains more rapidly. However, owing to the light freight and passenger traffic at present full advantage cannot be taken of the electrification. At present the Ritom station is the only source of power for the St. Gothard line, but the load on this is light, probably for the reasons mentioned and further because only the mountain section of the line is as yet electrically operated. The pressure tunnel between Lake Ritom and the water tower forming a part of the hydraulic plant has given considerable trouble from leakage, but by reducing the effective head the management has been able to keep the plant running. The leakage is due to cracks in the rocks produced by blasting during construction. When the second power plant, at Amsted, is completed the Ritom pressure tunnel will be repaired. Steps are being taken to prevent a repetition of the Ritom trouble at Amsted. The latter plant will be operated during 1922.

Dr. Smith found the Loetschberg Railway very busy due to daily shipments of 10,000 tons of coal from Germany to Italy over this route. He found that the 2,500-hp. Oerlikon locomotives, of which thirteen are in use, gave much smoother starting of trains than the motor coaches on the London lines. He noticed no signs of vibration, and stated that in the more recent designs springs have been put inside the pinion instead of the gear wheel to eliminate vibration. Dr. Smith visited also the Bernese Railway, electrified on the same system as the Loetschberg (single phase), where there are now fourteen 1,000-hp. locomotives in use.

At Spiez, where the Loetschberg as well as the Bernese locomotives are overhauled, there were only three out of twenty-eight locomotives in for repairs. One of these was a Loetschberg locomotive which had been stripped for its triennial overhaul. He was impressed by the small amount of repair work that had been necessary, even with the terrific wear and tear on the locomotives since 1913 due to heavy coal traffic.

Industrial Forum Formed

The Polytechnic Institute of Brooklyn, N. Y., has inaugurated an industrial and executive forum for the purpose of creating a better understanding of business and industrial problems. On Tuesday evening, Jan. 24, Professor William Z. Ripley of Harvard University will speak on "The Problem of the Railroads." On Monday, Feb. 6, George W. McAneny, chairman of the Transit Commission, will discuss the transportation problem of New York City. These lectures will be delivered in the Auditorium of the Polytechnic Institute, 99 Livingston Street, Brooklyn, N. Y.

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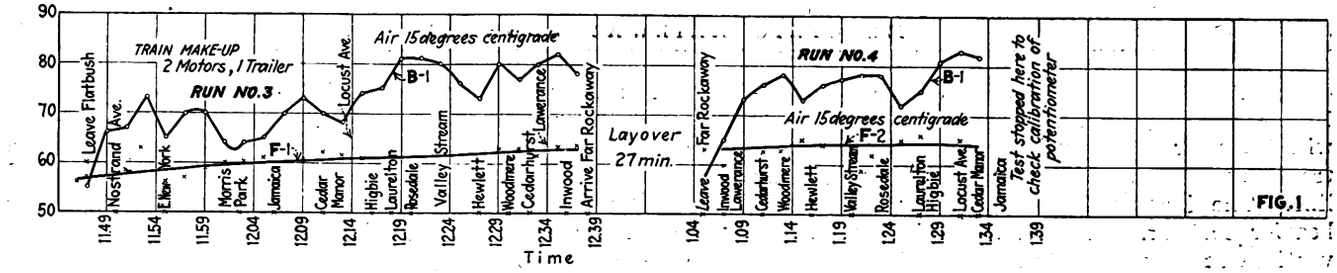

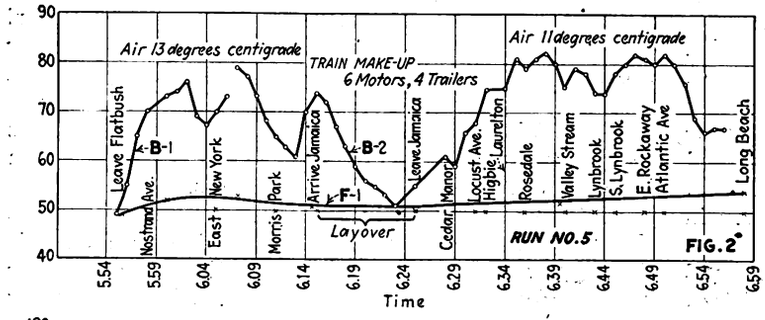

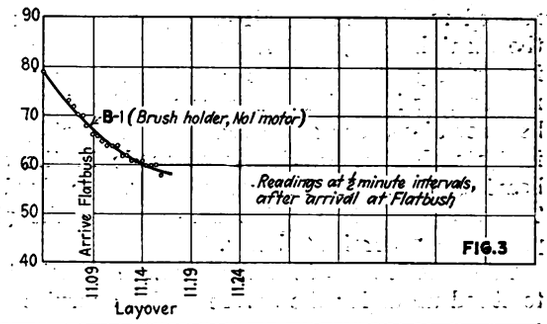

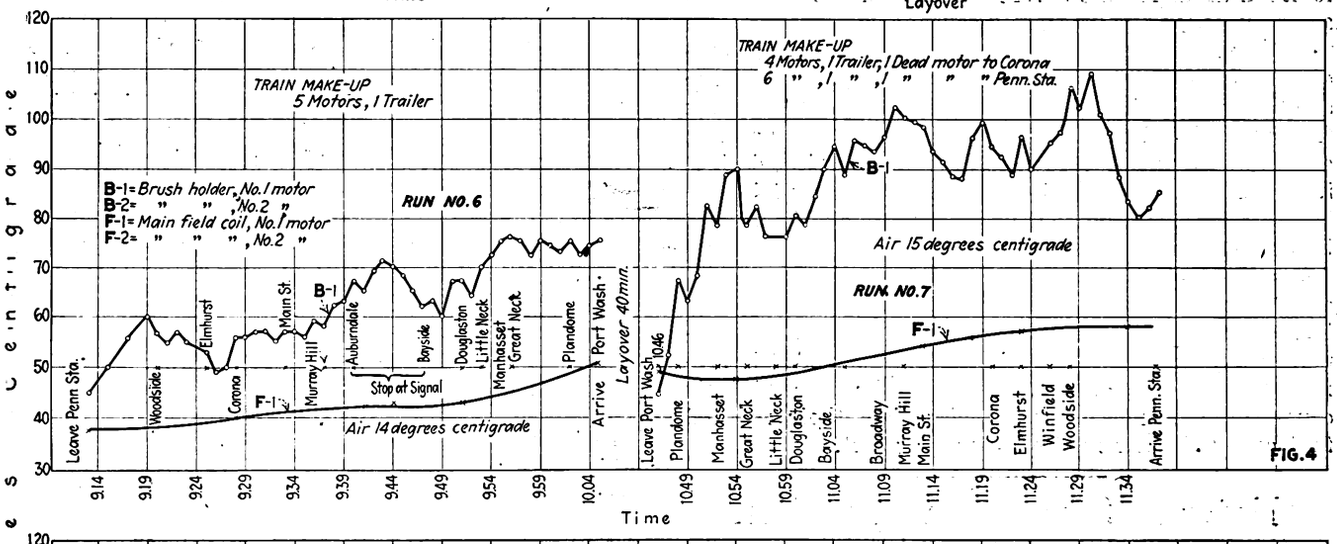

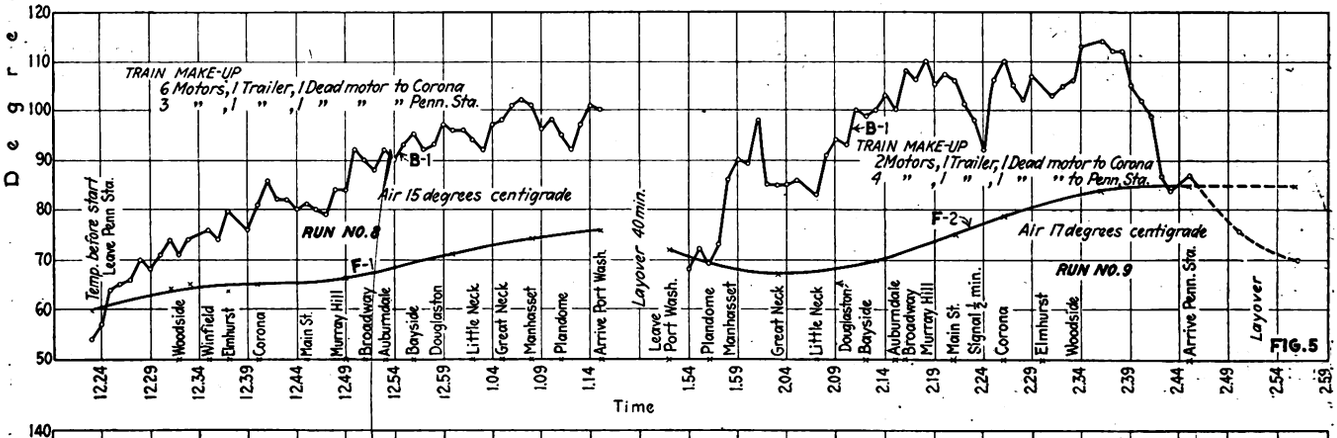

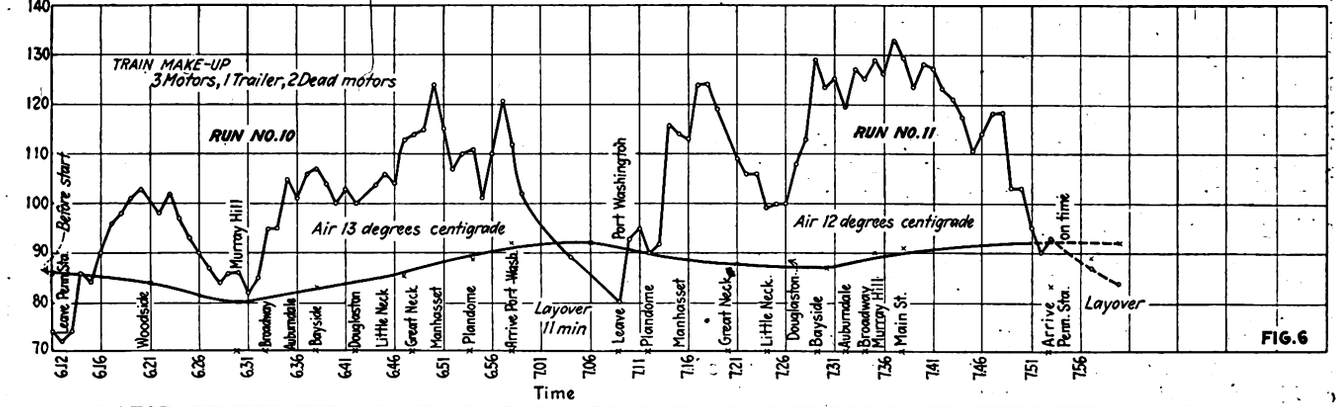

MOTOR TEMPERATURE READINGS FOR VARIOUS TRAIN MAKE-UPS TAKEN WITH THERMOCOUPLES

Runs Nos. 3 and 4 between Flatbush Terminal and Far Rockaway; run No. 5 between Flatbush Terminal and Long Beach; runs Nos. 6, 7, 8, 9, 10 and 11 between Pennsylvania Station and Port Washington

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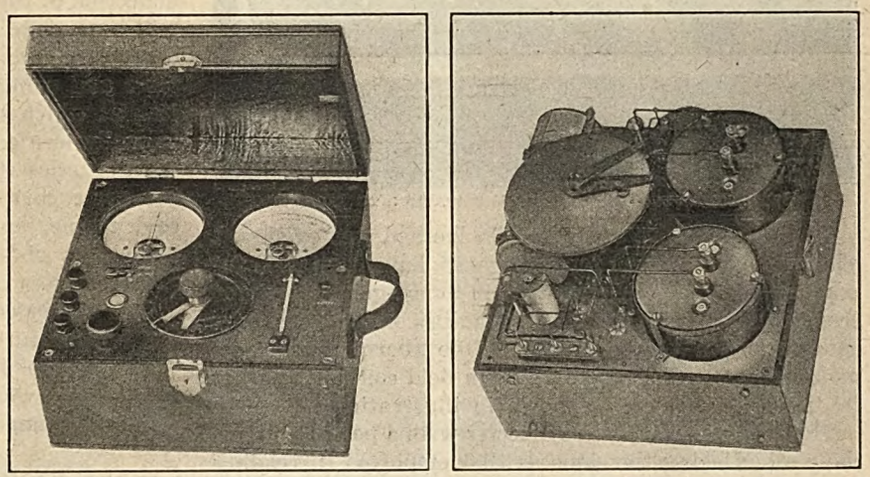
Determination of Train Make-Up

A Description of the Tests Made and the Results Which Were Obtained to Determine the Maximum Number of Trailers that Can Be Included with Safety in Long Island Railroad Electric Trains

BY G. C. BISHOP
Superintendent of Motive Power Long Island Railroad, New York, N. Y.

IN CONSIDERING the problem of the maximum number of trailers that can be included in any train with safety, it is evident that the ratio of trailers to motor cars will vary with service requirements. This would require an analysis of each division to determine the variation in schedule speed, number of stops per mile, average length and frequency of stops, length and severity of grades, layover at terminals, etc. In actual operation, however, it is inconvenient if not quite impossible to have several types of train make-up, as trains are made up at terminals continually for several different classes of service, so that the most convenient plan is to decide on a train make-up for the most severe condition, and then to use this as standard.



POTENTIOMETER USED FOR TAKING READINGS DURING TEST

Electric operation was first started by the Long Island Railroad in July, 1905. The first order was for 134 motor passenger cars and five motor baggage cars, each equipped with two Westinghouse type 113 motors. These have been operated exclusively on the Atlantic Avenue and Rockaway Beach Divisions. As the electrification of other divisions progressed and the service was extended under the East River into the Pennsylvania Station in New York City the first cars soon became inadequate to handle the service, and in 1908 more motor cars were ordered. These were entirely different, being longer and heavier and each having two Westinghouse type 308 motors. These equipments were designed for all motor car operation with forced ventilation of the motors. It was soon found, however, that the motors had sufficient capacity to operate the service without forced ventilation and later it was determined that trailers could safely be added.

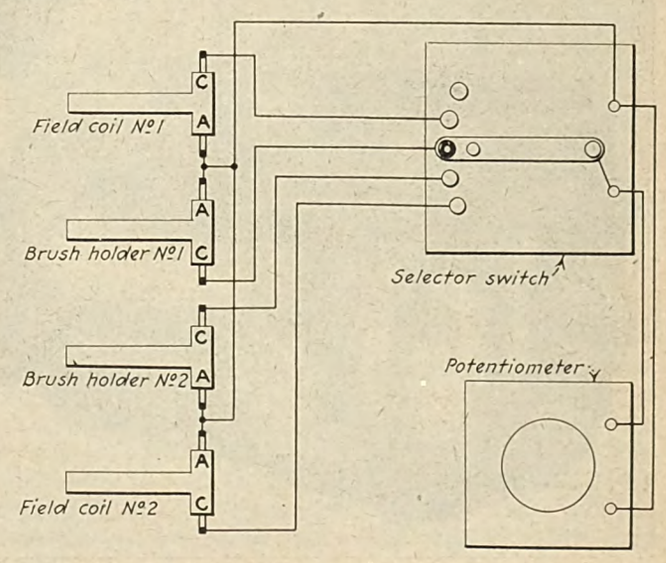
TUNNEL OPERATION NECESSITATED USE OF STEEL TRAILERS

In 1915 twenty steel trailers were ordered for the tunnel operation to Pennsylvania station and Flatbush Avenue. Tests at this time to determine the safe proportion of trailers were made in the conventional way with thermometers and a train make-up to include not more than one trailer for each two motor cars was specified. Exceptions to this ruling permitted the use of a higher proportion of trail cars in special trains, making long runs with few stops, notably Belmont race-track trains.

An order for twenty-five additional steel trailers was placed in 1917 and forty-five more were ordered and placed in service in 1918. Fifty additional trail cars were purchased in 1919 and placed on the road during the summer of 1920.

It will at once be appreciated that trailers could not be added to trains indefinitely and that some decision as to a standard train make-up was necessary. Accordingly, a series of tests was made in co-operation with engineers from the Westinghouse Electric Company to determine the heating of the motors with different train make-up and with varying service conditions of different divisions.

Our experience has shown that the capacity of the WH-308 motor in our service is limited by the short-time heavy-duty current taken by the motor, rather than by its continuous capacity. This is due in part to short runs with long layovers, which are the rule. Measurements of temperature by thermometer, made as they are at the end of the day, give no direct indication of the heavy overloads that a motor may have handled at short intervals in accelerating its train on the maximum grades.



WIRING FOR THERMOCOUPLES IN RAILWAY MOTOR TEST

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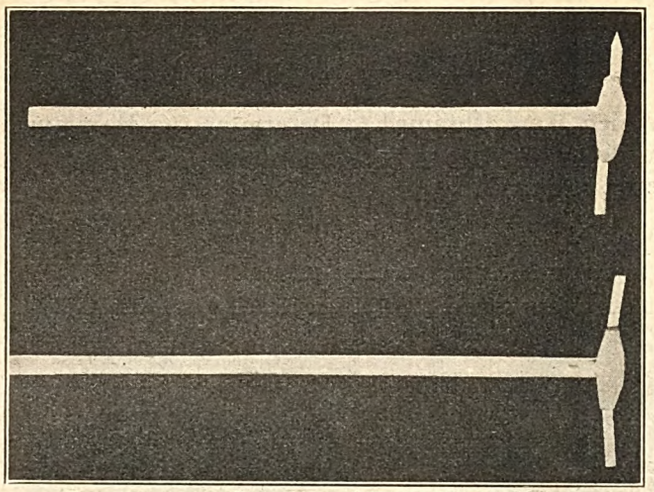


THERMOCOUPLES READY FOR APPLICATION TO MOTORS

To get a measure of this a new method was employed. Thermocouples, which for some years have been used for reading hot spot temperatures in turbo-generators and transformers, were used. Two motors on car 1690 were equipped with thermocouples. One thermocouple was mounted under the tape of a main field coil and another on the brush-holder, as shown in illustrations.

The readings were made directly with a potentiometer, the method being the same as that employed in reading turbo-generator temperatures. A dial switch was provided readily to put each thermocouple in circuit. Some description of this instrument and the method of securing temperatures will be of interest.

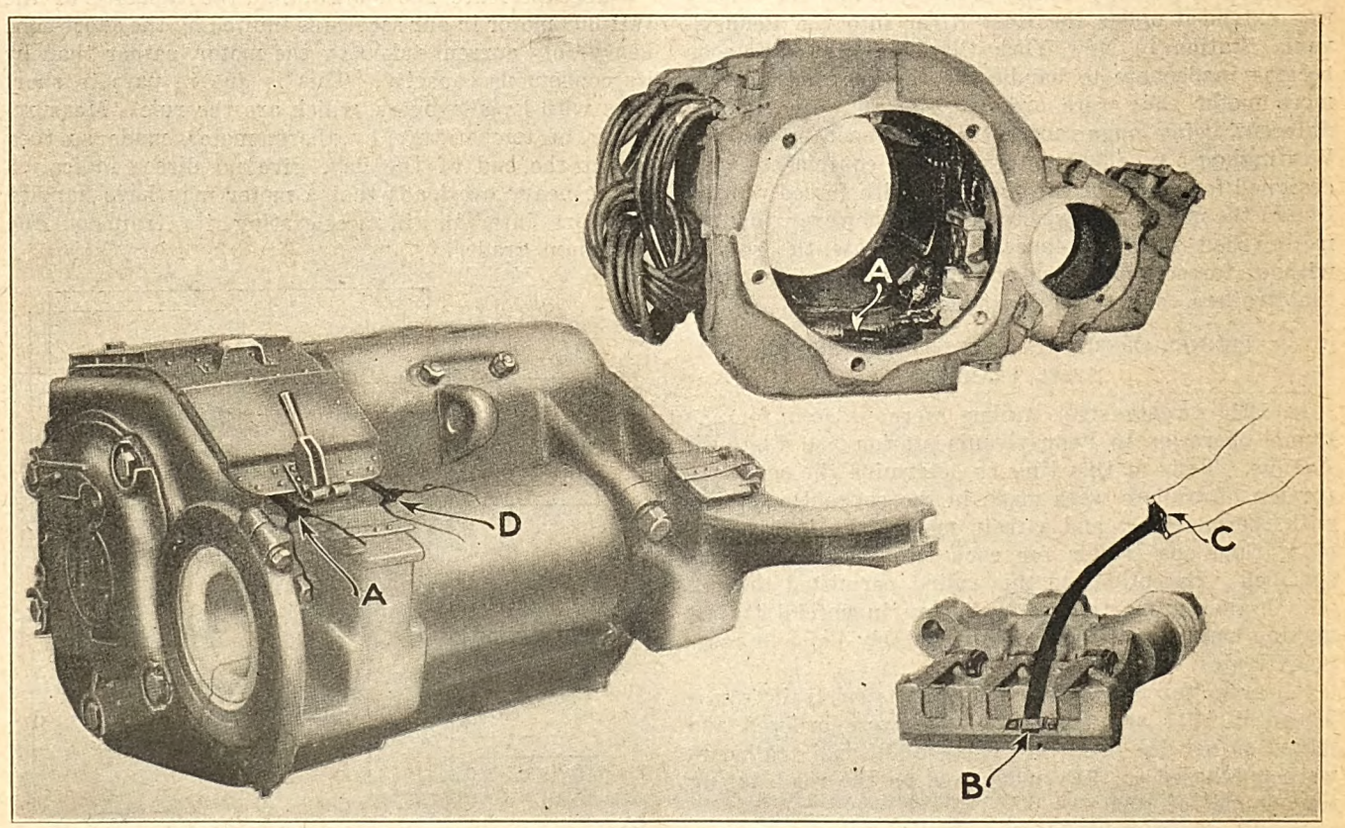
The potentiometer shown in accompanying illustrations operates on the slide wire potentiometer principle. A simplified diagram is also shown. A dry cell supplies current to a resistance wire equipped with two sliding contacts. The drop of potential between these contacts is proportional to the current in the wire and to the distance between them. Two pointers which move with the contacts indicate the positions of the two contacts. The scale is calibrated in degrees. A rheostat in the battery circuit is used for adjusting the current exactly to the value that will cause a drop of emf. per degree on the temperature scale equal to the thermo emf. per degree in the couple. Leads from the thermocouples connect to a sensitive galvanometer and to the slide wire contacts of corresponding polarity. If the emf. between the contacts is equal to the thermo emf. there will be no deflection of the galvanometer. If higher or lower, there will be a deflection of the galvanometer in one or the other direction. By changing the distance between contacts and using the galvanometer as a guide, the position at which the slide emf. balances, the thermo emf. is easily located.

In practice the lower pointer is set at the position on the scale corresponding with the temperature of the cold couple, and the upper pointer is moved until a balance is obtained as described. Actual temperature of hot couples can then be read directly on the scale.

One thermocouple is embedded in the mass of which the temperature is to be measured and the other, the "cold" couple, is contained in the instrument case and is in contact with the bulb of a mercury thermometer, by which the temperature of the cold couple is observed.

CONSTRUCTION OF THE THERMOCOUPLES

Westinghouse thermocouples are made by welding copper and "advance" (nickel-copper) alloy ribbons together. These ribbons are ordinarily 0.005 in. thick, 0.25 in. wide and of any desired length. The couple is insulated with mica and micarta paper to withstand a temperature of at least 150 deg. C. After installation in the motor a voltage test of 1,000 volts to ground was applied. A diagram of the actual connections used in the test shows just how the connections were made.



LOCATION OF THERMOCOUPLES ON FIELD COIL AND BRUSH-HOLDER AND METHOD OF BRINGING LEADS FROM MOTOR SHELL

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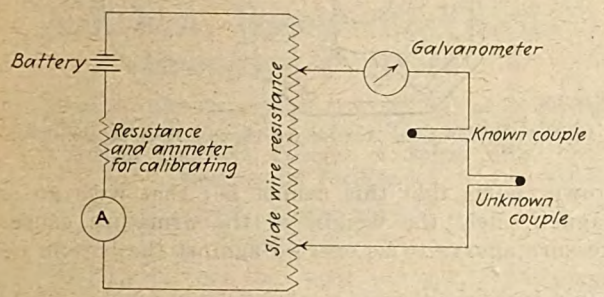
Runs were made on the Atlantic Avenue, Rockaway and Long Beach Division of the Long Island Railroad with what might be termed normal trains, *i.e.*, well within the capacity of the motors as determined by previous tests with thermometers. The potentiometer, as noted, is calibrated directly in degrees Centigrade, and after some experimenting it was found that accurate readings of the temperature of the brush-holder on one motor could be taken each minute, while the field temperature, which varied very slowly, could be taken dur-



DIAGRAMS OF CONNECTIONS FOR POTENTIOMETER

ing station stops. At intervals of eight or ten minutes readings were made on the thermocouples in the other motor as a check.

BRUSH-HOLDER TEMPERATURE VARIES RAPIDLY

It is appreciated that certain inaccuracies occur in this method of obtaining temperatures. The instrument is somewhat affected by the jar of the train and, as indicated by the curves shown, the temperature of the thermocouple mounted on the brush-holder varies very rapidly, particularly during acceleration. The direction in which the car is moving also makes a difference of a few degrees due to the difference in ventilation. Motors were run with bottom covers off on the commutator end and ventilated commutator covers, the standard summer time custom on this road. Repetition of similar runs, however, shows remarkable consistency. The temperature at the brush-holder is affected somewhat by commutator friction, sparking at the brushes and by the resistance between brushes and box. It is fair to assume, however, that the temperature at this point follows the same trend as the rest of the armature circuit.

Under the service conditions on this road the limiting condition in the WH-308 motor is the temperature of the soldered connections, and signs of distress appear when there is no indication of roasting of the coils themselves. Temperatures at these hot points are indicated proportionately, at least, by the thermocouple located on the brush-holder.

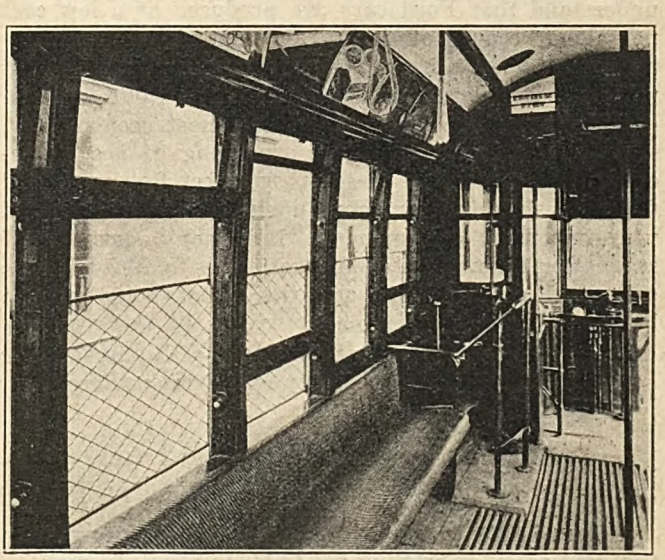
Referring to the graphs two facts are apparent. With the so-called normal train there is no tendency for the temperature to increase above a very conservative figure. With an increasing number of trailers in the train, however, as indicated by the graphs showing temperatures obtained on the Pennsylvania Station-Port Washington runs, the field temperature which represents closely the total or average temperature of the motor continually rises and, what is more significant, the spread between the field temperature and the armature circuit temperature increases, indicating that as the proportion of trail cars is increased the conditions affecting armature connections are increasingly severe. This is not indicated directly by the usual method of ascertaining motor temperature.

These tests have been most enlightening. We have been able to analyze our service conditions and to determine the maximum proportion of trailers that can be operated in our trains without exceeding safe motor temperatures, with the usual penalty of increased maintenance. We are arranging our operation for the future on this basis.

Friction Device and Catch for Windows

CAR WINDOWS must be kept tight so that they will not rattle and still they must work with sufficient freedom so that lady passengers can raise and lower them easily. The accompanying illustration shows a friction device and two automatic stops which have been applied to the cars of the International Railway at Buffalo, operated by the Mitten Management, Incorporated. With these applied to the window posts the windows are kept tight at all times and they are easily raised. In addition to these two desirable features it is impossible for the windows to drop on the passenger's arms or fingers. Both the friction device and the stops are set in the posts instead of being applied to the sash. The friction device has a small shoe which slides in the slot, and when the window is raised a light tension spring is compressed which creates very little friction and practically all the passenger has to do is to slide up the weight of the sash.

When the window is lowered the shoe slides down to the other end of the slot and a stiff spring is compressed which has just enough tension to allow the window to drop gradually. The stops are so placed that the bottom edge of the window sash rests on one when it is wide open, and another is placed 8 in. from the window ledge, which prevents a window while



WINDOW CATCH AND STOP

being lowered from dropping on a passenger's arms or fingers.

This sort of safety device appeals to the riding public, as every time a window is lowered there is a demonstration of the thought that has been given to this safety feature. In addition to being a desirable safety device, there is at the same time much less wear and tear on the window sash and fewer window glasses are broken, which means reduced maintenance costs.

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Letters to the Editors

Varieties in Safety Car Design Unfortunate

BROOKLYN RAPID TRANSIT COMPANY

To the Editors: BROOKLYN, N. Y., Jan. 14, 1922.

In reviewing the article by L. H. Palmer, president of the American Electric Railway Transportation & Traffic Association, as published in the JOURNAL of Jan. 7, 1922, I note reference to standardization as applied to the construction and equipment of safety cars, and while unwilling to enter into a controversy, I think it would be well for you once more to point out the fact that the electric railway industry for many years has suffered and is still suffering from a constant desire to have something special, on the part of its mechanical and transportation superintendents, as well as the managements of some properties.

There has never been as concrete an example of what might be done in the way of standardization of rolling stock as in the case of standard "one-man" Birney safety cars and where car builders are offering them to prospective customers at considerably less cost than the special car covered in some instances by specifications.

The Birney car is without question applicable to any service in any city or in any community, and at a time when additions to capital account or expenditures from earnings for either new rolling stock or conversion of old is a matter to be carefully considered it would seem as though too much stress is laid upon requirements of certain localities as seen by operating officials therein.

Furthermore, it needs no particular demonstration to understand that Ford cars are produced at a low cost not alone because of design and material, but largely because of the ability of the manufacturer to turn such vehicles out in large numbers and to make purchases in quantities that enable them to buy most economically.

It is unfortunate that the exploiting of special requirements, especially as seems to affect Baltimore and Chicago, should be inflicted upon this particular and very important development. It is not a question of stagnation following standardization, as in a broad sense this need never follow, and the issue should not be befogged in any such manner.

W. G. GOVE,
Superintendent of Equipment for
Lindley M. Garrison, Receiver.

Do Armatures Rub Top Pole Faces?

To the Editors: Jan. 14, 1922.

I should like to have you publish some information that will assist in settling the following controversy:

Smith claims that in a railway motor operating under a car, when the current is applied and the car is going in one direction, the armature rises from the bottom pole pieces, and comes as near the top pole pieces as it is allowed to do by the armature caps. He claims to have seen quite a number of armatures damaged on account of loose axle caps, and that this partly proves his contention. He also said that sometimes in order to determine the wear on armature bearings, in an emergency and not as a regular thing, of course, he would have some one set the brakes to prevent the car from moving and would then apply the current while he watched the armature by opening up the hand hole in the top of the gear case. With the controller set for motion of the car in one direction he would see the pinion climb up the gear as far as the wear on the bearing would permit.

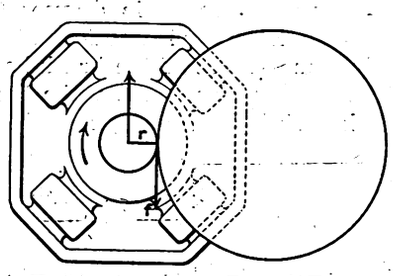

DIAGRAM OF FORCES ACTING AT PINION END OF ARMATURE

Brown claims that this cannot be; that with an even magnetic field the weight of the armature causes a pressure always to be exerted against the bottom bearing.

This discussion relates, of course, to motors with worn-bearing conditions.

A READER.

EDITOR'S NOTE.—Smith is right in his assumption that with the controller set for motion of the car in one direction the armature will rise so as to come nearer the top pole faces to the extent that the wear in the bearings and housings will permit. Armatures are damaged quite frequently due to their rubbing the top pole faces, and many roads use metal gages to determine the wear that would permit movement toward the top of the motor. This tendency of the armature to rise is not primarily* caused by the magnetic pull, but rather the tendency of the pinion to ride up on the gear when the armature is turning in one direction.

The reason for the pinion climbing can be best illustrated by reference to the accompanying diagram. For the sake of illustration, assume a 50-hp. motor rotating in the direction indicated by the arrow at a speed of 500 revolutions per minute. The force, *f*, due to the torque of the motor at the pitch line of the pinion and gear is assumed as being in a downward direction. This is balanced by an equal force in an upward direction at the center of the armature. If this force is greater than the weight of the armature, the pinion will ride up on the gear. The force in this case will be equal to 50 (assuming the motor to be developing its rated horsepower) times 33,000 ft.-lb. per minute divided by 500 r.p.m., times the radius from the center of the armature shaft to the pitch line of the pinion, which may be considered as 4 in. or $\frac{1}{3}$ ft. times 2π. With the conditions as assumed, this force will be approximately 1,576 lb. Thus

$$f = \frac{50 \times 33{,}000}{500 \times \frac{1}{3} \times 2 \times 3.1416} = 1{,}576 \text{ lb.}$$

The opposing force is the weight of the armature, which for a 50-hp. motor would be approximately 600 lb. One-half of this weight would be supported at each bearing, so there would be 300 lb. at the pinion end bearing exerting pressure in a downward direction. We thus would have an excess of 1,276 lb. tending to raise the armature at the pinion end so as to cause it to ride up on the gear. Of course, there is no force at the other end of the armature tending to raise it.

*There is of course an additional secondary lifting effect due to the unbalancing of the magnetic field through eccentricity of the armature in the bore. This, however, only comes into action after the armature has been lifted by the pinion torque.

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Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

A. E. R. A. Easements Versus Brooklyn Practice

An Explanation and Example of the Difficulty of Standardizing This Detail of Track Layout—The Author Gives One of His Own Designs of Spiral with Reasons for Its Form

BY S. STRIEZHEFF
Brooklyn, N. Y.

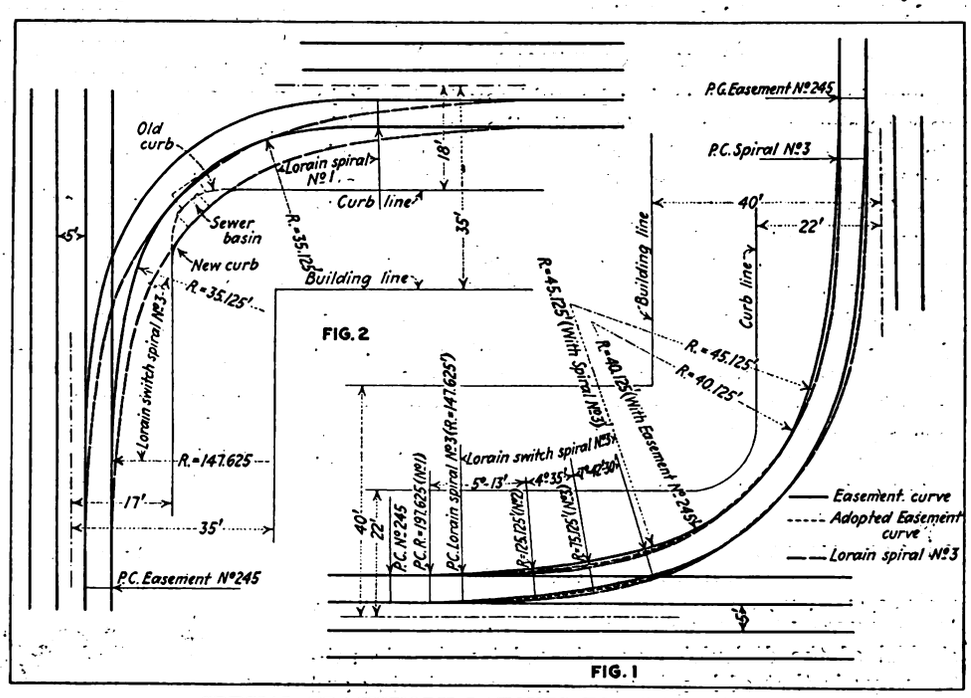
APPENDIX "C" of the report of the committee on way matters, as submitted to the 1921 convention of the American Electric Railway Engineering Asociation, invites discussion of the merits of spiral easement curves suggested for general adoption by electric railways. It further suggests that members study them with reference to their own particular conditions. I have discussed this subject informally with R. C. Cram, chairman of the committee. As I do not agree entirely with his views, I am, at his suggestion, presenting my views here for consideration by those who may be interested in the subject of possible standardization of switch easements and spiral curves.

For a number of years I have had to juggle all kinds of special trackwork layouts. With my nose close to the grindstone, but with an unobscured vision, I possibly realize the essential factors in matters of this particular kind more correctly than those who are not so directly connected with the work. Mindful of the injunction in the committee report, "with reference to their own particular conditions," I believe that it was wrong procedure on the part of the committee to prescribe standard easements without considering more fully the actual conditions and physical limitations that the electric railways have to contend with.

As to Brooklyn, I venture to assert that had the committee fully informed itself as to the relative percentages, in that city, of roadway widths at special trackwork connections, it would have dropped any suggestion of 200-deg. radius switch easements for adoption in this otherwise spacious borough.

First, the intervening, long-radius curve immediately following the switch radius, adopted for greater car clearance at the beginning of the spiral, is altogether unnecessary, considering the maximum size of B. R. T. surface cars. It only unduly lengthens the lead and increases the cosecant, thus bringing the curve nearer to the curb, where ordinarily there is lack of room under the best of conditions.

The committee report divides the suggested easements into two groups; four easements indicated in heavy type for general use and three easements in light type to be used only in special cases on account of local conditions. In a recent communication to E. M. T. Ryder of the Third Avenue Railway, C. A. Alden of the Bethlehem Steel Company admits that "for Brooklyn conditions it would be most unusual for the 'heavy-face tables' to be available," further stating that "it was pointed out to the sub-committee last year that the majority of cases would be the 'special condition' shown in the 'light-face tables.'" A somewhat paradoxical proposition, is it not?



SPECIAL TRACKWORK LAYOUTS FOR BROOKLYN

Fig. 1—Easement curve connecting tracks on intersecting 44-ft. streets. Fig. 2—A typical Brooklyn easement curve situation, involving the cutting away of a curb corner.

For a location shown in Fig. 1, a location exceptionally favorable for Brooklyn streets, with two 44-ft. intersecting roadways, the use of special easement No. 245 was suggested as indicated by full lines, in place of the originally intended Lorain spiral No. 3, represented by dash lines. This was to allow for a 200-ft. radius switch instead of one of 150-ft. radius. In the meantime, however, with the same purpose in view I worked out an easement curve indicated by dotted lines, retaining spiral No. 3 at the plain end of curve in intersecting street. This easement consists of three radii leading

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up to the point of the frog and then abutting on the plain curve of 45.125-ft. radius with a cosecant practically the same as in easement No. 245 with a 40.125-ft. radius. This curve has been approved for installation at this particular location. This easement is certainly sturdier and is not afraid of the chill of practicability, as compared with easement No. 245, which smacks a little of the hothouse.

It may even be advisable to use the approved easement in other locations if a 200-ft. radius switch is desired, and where conditions permit it. This retains a constant lead and frog (except one arm), which is on the same principle as Lorain spiral No. 3, presenting the same conditions up to a plain curve radius of 52.625 ft.

An interesting illustration of what we have to contend with in Brooklyn is given in Fig. 2. This location presents conditions much more favorable than the average conditions that obtain here, considering the roadway widths, and yet the curb corner has to be cut away, as indicated, to allow cars to round a curve which provides clearance only in the tangent track on the No. 3 spiral end. It was necessary to come down to a central radius of 35.125 ft. with a Lorain spiral No. 1 on the plain end. What happens with an easement No. 245 in place is indicated by dash lines.

SUMMARY OF CONDITIONS

Summing up the foregoing I would say that only in exceptionally favorable locations like the one shown in Fig. 1 at street intersections of less than 45 deg. angle would it be possible to use 200-ft. radius switches, and even there probably not with A.E.R.A. easements. This is true on account of the intervening long-radius curve following switch radius, as no extra clearance is necessary for Brooklyn cars. And although these easements are generally somewhat unwieldy and take up too much of the arc to allow for any variation to suit a particular local condition, such as manhole obstructions and others, I would prefer them to the ones at present in use, were I not a slave to the habit of facing facts and conditions.

In conclusion I would say that all herein is stated entirely in a spirit of co-operation, remembering Shakespeare's words: "No might, nor greatness in mortality can censure escape!"

Weighting Lanterns to Keep Them Upright

ONE of the difficulties experienced by electric railways is that of keeping lanterns from tipping and blowing over where it is necessary to place them at night during construction work on streets or highways. Even though the workman places the lanterns in their proper position so they will warn traffic of danger, still a strong wind may arise that will tip one or more of them over and extinguish the light, thus causing a dangerous condition.

The *American City* for January refers to the use of a small concrete block in which the bottom of the oil reservoir of the lantern has been imbedded to prevent such occurrences. To make the block a form of lumber 8 in. square and about 4 in. deep is made. A portion of the concrete is placed in the bottom, and upon this, in the center, the lantern is placed, care being taken to see that the oil filler cap is above the top of the form. The remainder of the form is then filled with concrete, so as completely to cover the oil reservoir as high as desired. Care should be taken to insure that the oil cap and thumb screw for adjusting the wick are accessible.

Chattanooga Remodels Cars

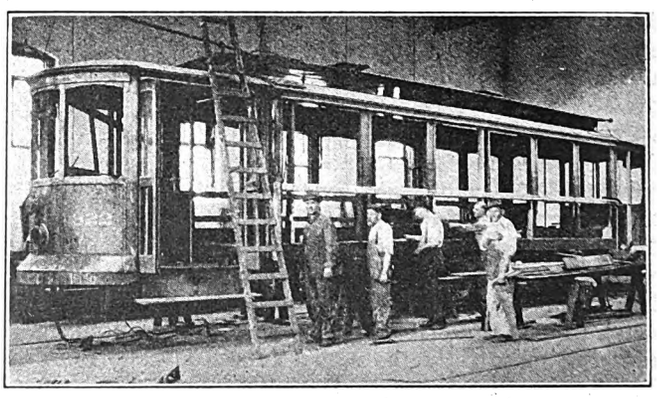
A Large Amount of Work Has Been Done in Remodeling and Rebuilding Various Cars of the Chattanooga Railway & Light Company Since the Receivers Took Charge of the Property in 1919

AN EXTENSIVE program of rebuilding, painting and overhauling of car bodies has been carried on by the Chattanooga Railway & Light Company during the last two and a half years. The receivers took charge of the railway property on April 18, 1919, and from then to August, 1921, sixty-five cars passed through the carpenter and paint shops, the greater portion of this number being entirely rebuilt or remodeled.

In carrying out the work the cars are first brought into the carpenter shop, where they are gone over carefully and the extent of the rebuilding necessary is determined. Some cars are but partially rebuilt with new posts, new paneling and repaired vestibules, while others are in such bad condition that it has been found necessary to strip them and rebuild the bodies from the sills up. In this rebuilding some cars have been remodeled during the course of construction; eighteen of those now in service have had the old sliding doors replaced with swinging exit doors, as experience has shown that the folding doors work more easily and require less energy on the part of the motorman to open and close. Three cars with small vestibules have had a change made in the location of the conductor's position on the platform. This has been found necessary because with the small vestibules congestion was very great and the relocation of the conductor's position helps to relieve this.

Overhauling trucks	$275.00
Overhauling motors, including new gears and pinions but no rewinding	325.00
Carpenter work on body, including twenty new seats	2,438.38
Body painted with the latest system described	312.18
Other electrical equipment	75.00
Air-brake equipment	40.00
Installing new sanders	45.00
Overhead expense	225.00
Total per car	$3,735.56

The sixty-five cars referred to included six trailers, and the total cost of body repairs and painting amounted to $53,591.24, an average per car of $577.42 for the carpenter work and $247.06 for painting. Of course some cars cost more to rebuild than others, but the following figures for two general classes of remodeling will give an idea as to the extent of the work. On cars of the 326 class the costs shown in table above apply.



CAR NO. 322 IN COURSE OF RECONSTRUCTION IN THE CHATTANOOGA COMPANY'S SHOPS

In remodeling this class of cars the concave-convex paneling was replaced with straight side tongued and

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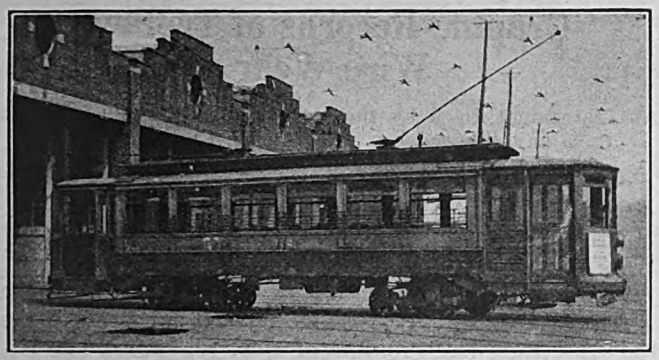
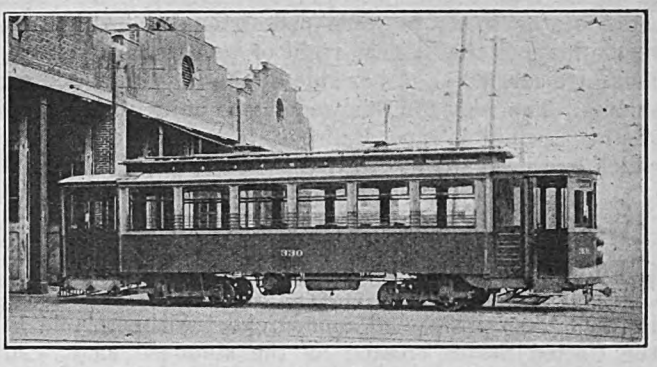


CAR OF THE 326 CLASS BEFORE REMODELING. NOTE CONCAVE-CONVEX PANELING



THE REMODELED CARS PRESENT A CLEAN, NEAT APPEARANCE

grooved wood. There was an extra side sub-sill to build out the bottom of the post. The sliding doors were replaced with folding doors and the sash was rebuilt from the form shown in the illustration for the original car to the form shown in that for the rebuilt car.

The reconstruction work on cars of the 302 class included costs as follows:

Body work including the rebuilding of old seats	$1,123.95
Painting	349.43
Overhauling motors	400.00
Overhauling trucks	300.00
Overhauling air brake equipment	40.00
Other electrical equipment	100.00
Installing sanders ($20 for labor and $25 for material)	45.00
Overhead expense	179.25
Total per car	$2,537.63

With this 302 class of cars every other post was put in new and every other post was spliced and rebuilt. Some of the cars required new sills while others were found in such good condition that new sills were not needed. The same platform and vestibule framing was used, but the conductor's location was moved and the bulkhead was eliminated. As will be noted by referring to the accompanying illustration, the former concave-convex paneling on the side, which was of wood, was replaced with steel which was flat. In order to install this steel paneling the posts were blocked out until they presented straight sides for the mounting of the steel plates and a piece of wrought iron ½ in. x 1½ in. was run lengthwise at the bottom of the post to which the steel was fastened. The same roofing was used.

The above figures apply where extensive reconstruction was undertaken, but where only moderate repairs were necessary the total cost for carpenter work and painting rarely exceeded $500.

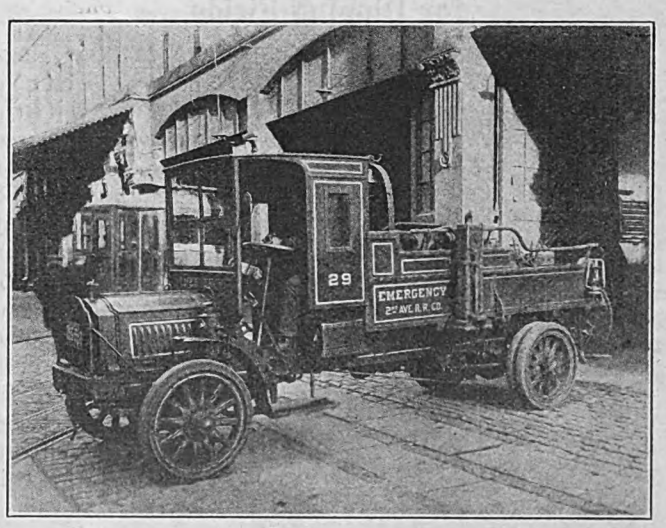
NEW PAINTING SYSTEM USED

After completing the work in the carpenter shop, the cars were run into the paint shop, where they were painted both inside and outside. In the car interior the old varnish was scraped off down to the wood and built up as new. On the exterior most of the cars required the removal of the old paint and varnish and then the painting consisted of a flat color and varnish system which has replaced a method used in former years when a system of enamel or color varnish was used. With the latest system the paint is first burned off down to the wood and then sanded off. A coat of lead primer is applied and then puttying is done, after which three coats of "Krakno" surfacer are added and the sanding process is repeated. Two coats of flat color and one of cadmium glaze are then added. Red striping, trimming and the necessary lettering are then done and two coats of outside wearing varnish are applied, making in all seven coats of paint and two of varnish. The time taken to paint a car with this process is nearly three weeks.

Beaverboard headlining is being tried on some of the cars and the first of this type has now been in service nearly a year. In using beaverboard the upper side is treated with two coats of heavy lead paint as are also the edges of the board. In treating the edges the paint is pounced in well for preservative effects. The under side of the beaverboard is finished with a lead filler and headlining paint, which consists of a cream paint on a lead base. At the time of this installation the beaverboard cost 5⅛ cents per square foot and it appears that 1⅞ cents would take care of the labor and paint, making the total cost about 7 cents per square foot installed.

Motorized Emergency Truck

THE Second Avenue Railroad, New York, N. Y., has recently added several motorized wagons to its equipment for use in connection with track and line repairs. The wagon shown in the accompanying illustration is used for emergency service for rerailing cars and making repairs which require immediate completion



EMERGENCY TRUCK WITH 2½-TON PACKARD CHASSIS AND BODY CONSTRUCTED IN RAILWAY COMPANY'S SHOPS

in order to restore service to normal operation. This wagon has a 2½-ton Packard chassis, and the body is equipped with bins on either side for carrying the smaller tools necessary, the center portion being used for larger equipment and cables. A substantial step is provided at the rear and a pipe railing along the side. A large bell is mounted immediately behind the cab by a strap-iron framework. This is manually controlled by

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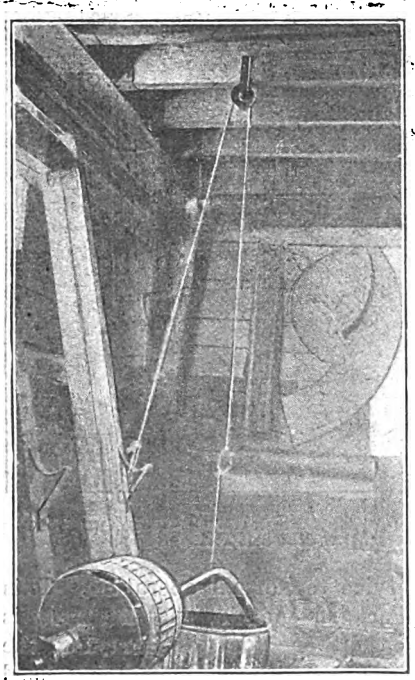
the operator so as to warn pedestrians and traffic in such a manner that a clear right of way will be secured. Jacks are carried on either side of the body mounted on shelves. The body for this wagon was built in the shops of the Second Avenue Railroad to satisfy conditions which had been found to exist.

Wood Preservation Increases Life of Ties

STATISTICS given out by the service bureau of the American Wood Preservers' Association show that in 1920 the railway and commercial treating plants in the United States treated by the standard empty-cell and full-cell pressure processes 44,987,532 crossties, or 20 per cent more than were treated in 1919. About 65 per cent were treated with approximately ½ lb. of zinc chloride per cubic foot, 30 per cent with an average of between 7 and 8 lb. of creosote and 5 per cent by the zinc-creosote process, with ½ lb. of zinc chloride and 4.6 lb. of oil. Of the total number of ties treated, 2,310,793, or about 5 per cent, were reported for use by electric railways.

Service test records show that at least fifteen years service can be expected from well-treated ties under heavy traffic, and only a very small percentage of well-treated ties have been removed after fifteen to twenty years in the track. Ties have given excellent service when treated according to the "Specifications for Preservative Treatment of Wood" included in the report presented at the convention of the American Electric Railway Engineering Association last October.

Special Equipment Not Necessary for Dipping Fields



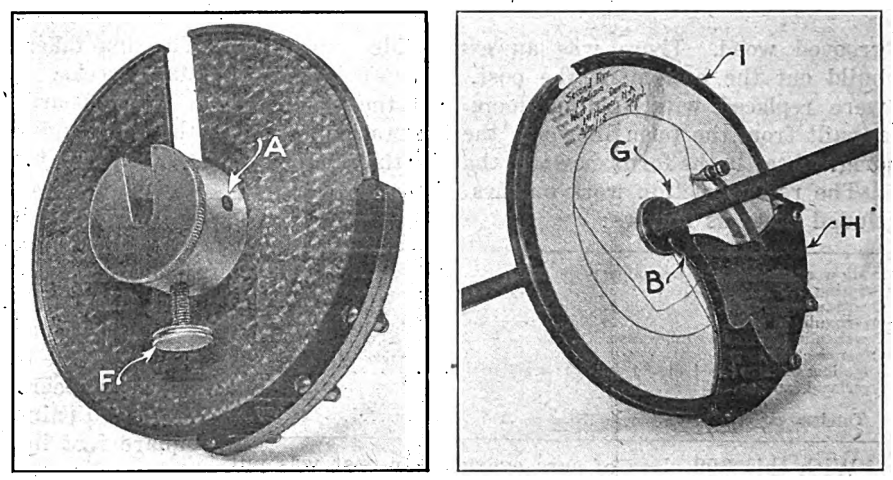
ON A New England electric railway where money was scarce for the purchase of shop equipment, the simple arrangement shown herewith was installed to facilitate dipping railway motor field coils. The dipping compound is carried in an 18-in. diameter by 24-in. high galvanized iron barrel and the coil is lowered and raised by the simple expedient of passing a ⅜-in. manila rope around a discarded 4-in. trolley wheel fastened to the rafters by two strap-iron hangers. Dipping and draining are thus cared for with resulting saving in dipping compound and convenience of handling.

Graphic Records of Trolley Wire Wear

An Instrument Used by the Puget Sound Power & Light Company Reproduces the Exact Contour of a Trolley Wire on an Enlarged Scale

BY FREDERICK G. WISWELL
Chief Draftsman Puget Sound Power & Light Company, Seattle, Wash.

AN INSTRUCTIVE article on "Gaging Trolley Wire for Renewal," by G. H. McKelway, appeared in the ELECTRIC RAILWAY JOURNAL of Nov. 19, 1921. The latter part of the article points very clearly to the advantage of recording graphically the amount and character of wear on trolley wires.



FRONT AND REAR VIEWS OF WIREOGRAPH INSTRUMENT

Prior to selling the traction system to the city of Seattle, the Puget Sound Traction, Light & Power Company (now the Puget Sound Power & Light Company) looked into the question of providing a means for obtaining information in connection with inspecting and replacing worn trolley wire, aside from the old method of using micrometer calipers or of judging conditions by the number of breaks and general appearance of the wire. At that time the writer submitted an original device, since called the "Trolley Wireograph Instrument," for use in such work. The following description and accompanying photographs explain its usefulness to railway companies desirous of keeping systematic records.

The device reproduces graphically the amount and character of wear on a trolley wire by making an enlarged duplicate, on paper, of a cross-section of the wire taken at any point where a record is desired. This record is true to actual conditions, so that comparisons can be made with the original contour. These paper records or charts can be filed for subsequent reference to show where the wire is injuriously worn, and by adding the dates of installing the wire and of making the graphic record a desirable indication of the rapidity of such wear is afforded. The probable length of service of the wire, or of a new wire installed under similar conditions of service, can also be accurately judged.

In addition to the use of the charts in connection with direct maintenance, they have been a great aid to the testing department in determining the tensile strength, conductivity and durability of worn sections. The records not only show where the wire is thin, but careful analysis also often points to the cause of undue

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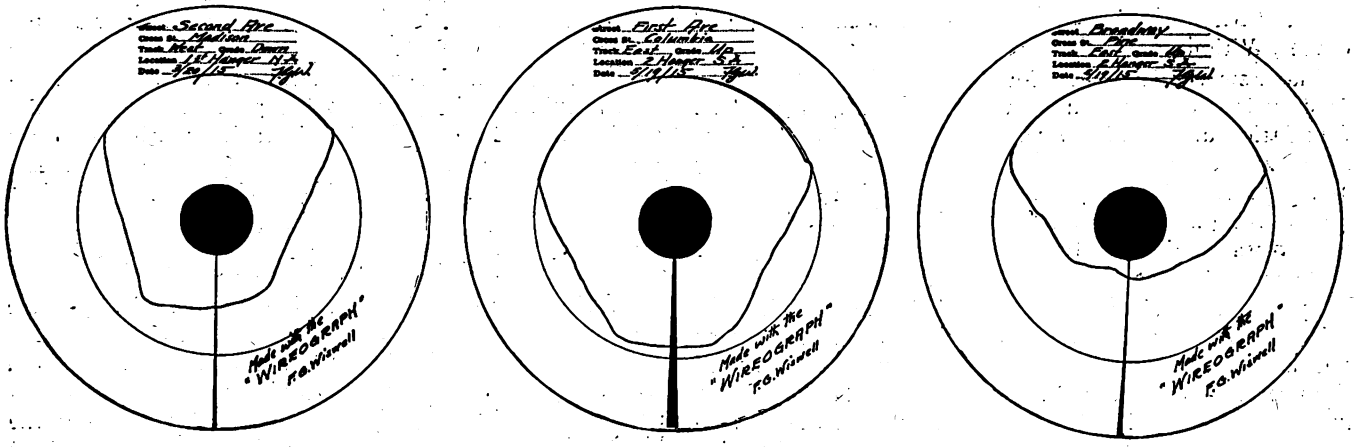


RECORD CHARTS GIVING AN ENLARGED REPRODUCTION OF SOME WORN TROLLEY WIRES

wear, such as improper alignment of wire, defective tracks, etc. With the "Trolley Wireograph Instrument" one trolley repair man assisted by a tower truck and driver can easily make the records without slowing up the traffic, even when the cars are running on a one-and-one-half-minute schedule.

The instrument is adapted to either round, grooved or figure eight wire from single No. 0 to No. 0000 in size, the only change necessary being the removal of the bushing and replacing it with one of proper size, which can be quickly done by loosening a small set-screw, shown at "A" in the photograph. No disturbance of the wire is necessary as the instrument can be quickly attached or detached by a simple clamping arrangement. The tracer arm is shown at "B" and has a hardened steel point at the tracing end. This point is ground to a chisel edge parallel to the longitudinal axis of the wire. The pencil arm engages the tracer arm by means of a simple gear arrangement. The whole mechanism is carried by the sector-plate "H," which in turn can be moved around the rim of the slotted disk "I" when this is clamped to the trolley wire by the clamping screw "F" on the rear side of the instrument. Provision has been made to enable adjustment of the position of the pencil point in reference to the tracer arm when necessary so as to take up wear in the instrument, etc.

Circular paper charts of suitable stiffness to bridge across the slit in the disk, when the pencil is marking, are used as shown in the photograph. These charts are cut from a steel die, including the slit which is provided so that an opening can be made sufficient to pass over the trolley wire. To prevent the chart from turning while the record is being made, a small needle point is provided in the face of the disk. This is shown at "G."

Each chart has printed on its face a true circle concentrically located, its diameter being ten times that of the wire, for convenience in comparing contours. Also a blank form is printed on the face of the chart for keeping a record of the street, cross street, grade, etc., to be filled out for future reference.

The "Trolley Wireograph Instrument" has proved of considerable value to the Puget Sound Power & Light Company in that it provides an accurate means for making records that can be kept systematically, the cost of which is very low when compared with the increased saving in the annual cost of trolley wire maintenance. Nearly 3,000 record charts have been made and some very surprising results obtained. Some of these graphic records were taken at the same location two or three times on different dates for the purpose of studying the successive stages of wear.

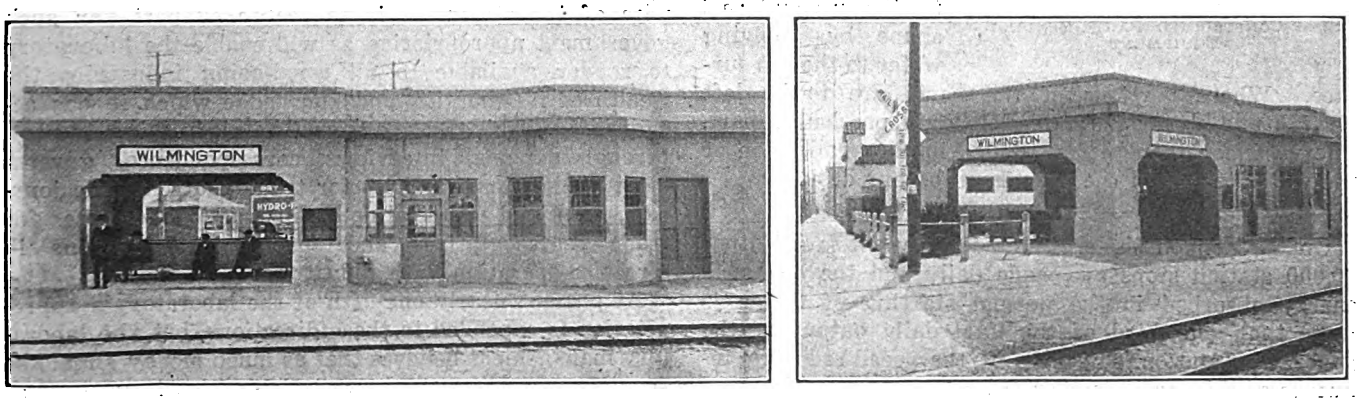
The three charts shown in the accompanying illustration represent typical performances of the instrument.

Attractive Stucco Station

Passenger Waiting Station Constructed by the Pacific Electric Railway at Wilmington, Cal., on the San Pedro Main Line

BY CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

IN ORDER to meet the exigencies of traffic, and taking into consideration the rapid growth of Los Angeles harbor, the Pacific Electric Railway deemed it expedient to provide improved passenger waiting station facilities at Wilmington, Cal., which point constitutes the main district of the inner harbor of port Los Angeles. The Pacific Electric Railway serves this point and the harbor with its San Pedro main line. The new pas-



THE PACIFIC ELECTRIC WAITING STATION AT WILMINGTON COMBINES THE ELEMENTS OF SAFETY, COMFORT AND ATTRACTIVENESS

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senger station, completed last spring, is located at Canal Street, Wilmington.

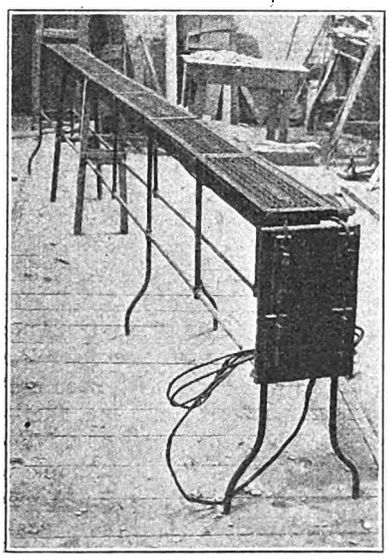
The new station is modern in every respect, being constructed for both appearance and stability. The foundation and outside walls to a height of 3 ft. above floor level are constructed of concrete. The remainder of the exterior is stucco finish. The station has cement floors throughout. The length of the structure is 62 ft., the extreme height is 16 ft.

Recessed into the front wall, as the view shows, and to left of the main door, is space for a hose rack, containing 50 ft. of 1½-in. fire hose; also, a fire hydrant opening is contained in this pocket. A glass door covers the pocket—to be broken in case of fire. A second fire hydrant has been installed at the rear wall of the station. Also, at the left of the main door an exterior drinking fountain has been provided.

The station consists of an open waiting room, 23 x 24 ft. inclosed waiting room, agent's office, express room and public comfort stations for both men and women. The open type of waiting room is a very popular feature on passenger stations erected by the company, as it appeals to the traveling public on account of the mild California climate. Also, it adds to the artistic element of the structure.

Panel Bending with Shop-Constructed Equipment

THE accompanying illustration shows the equipment used by the Second Avenue Railroad, New York City, for bending panels for the sides of cars which it is reconstructing. Six panel electric heaters removed from old cars are mounted, face uppermost on a pipe framework. Switches with fuses are mounted on the ends so that three degrees of heat can be obtained in a manner similar to that used in regulating the heat of electric cars. The panel to be shaped is laid on top of the heater, current is turned on and the panel is bent to the required shape by applying water to the top surface. Where portions of the panel are to be left straight no water is applied to this particular part. The workmen soon become skilled in the application of the water to obtain the necessary contour desired.

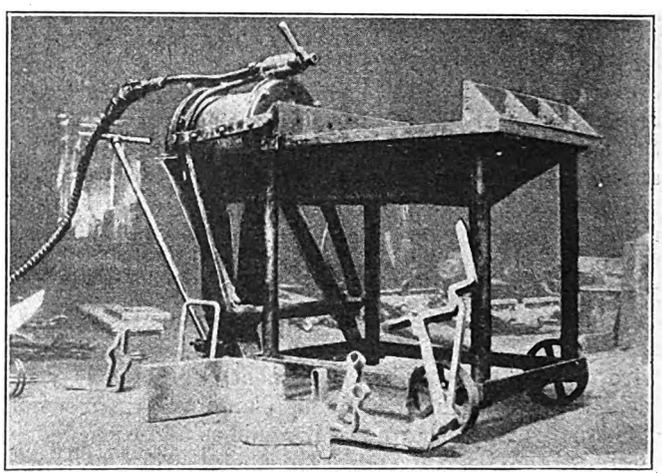


SHOP-CONSTRUCTED PANEL-BENDING EQUIPMENT

On the London Underground Railways it is said that 80,000 station stops are made daily and the electrical energy absorbed in the normal starting of trains is more than one-third of the total daily output of the generating station. Because of the speed-reducing influence of this large number of station stops the interval between stations on any new line should be widened, according to J. P. Thomas, operating manager of the system, and the diffusion of traffic between stations should be provided for by surface transit. Consideration should also be given to the plan of equipping the stations with four tracks, two in each direction, to allow for one train to load and unload while the following train does the same at an adjacent platform.

Home-Made Bulldozer

THE accompanying illustration shows an inexpensive bulldozer which was constructed in the shops of the Portland Railway, Light & Power Company. An old 12-in. airbrake cylinder was used for operating it and as constructed this makes a very handy tool for the blacksmith shop. The body portion is made of sheet steel and angle iron welded together. The movable head is connected to a rocker shaft so as to keep the two heads always parallel. Nearly any shape and size angle can be bent in this machine up to 1 in. x 6 in. angle iron knees used for trackwork.



INEXPENSIVE HOME-MADE BULLDOZER

Forest Products Laboratory Desires to Widen Scope of Service

AT THE request of the Association of Wood Using Industries the Forest Products Laboratory, Forest Service, United States Department of Agriculture, has prepared a statement calling attention to conspicuous examples of industrial waste which might be greatly reduced if the Forest Products Laboratory had the facilities for assisting in the actual application of more of the results already obtained in its research. The purpose of the statement is to secure support for such government appropriation as will enable the laboratory to render available to all wood-using industries the wealth of information and knowledge which it has accumulated. This the laboratory is already doing in part, through personal interviews, correspondence, government publications, articles for trade and scientific journals, news and technical notes, instructional courses for trade representatives and special investigations in direct co-operation with industries.

At present nearly one-fifth of the laboratory's appropriation is expended in these directions, but the laboratory management believes that as much money should be spent in spreading the information which it gathers as in the fundamental research itself.

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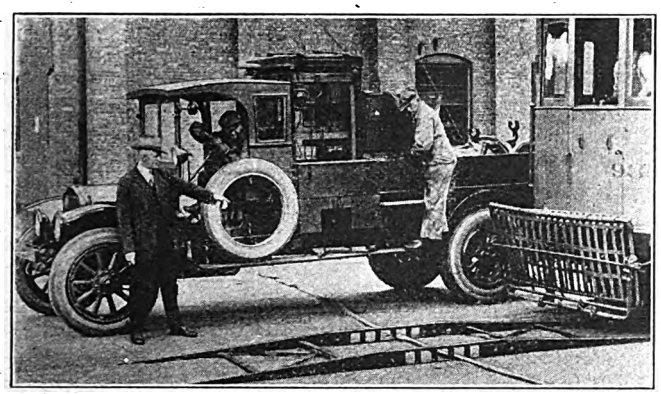
New Truck Has Many Uses for Relieving Emergency Situations

A NEW 2-ton White truck recently placed in service by the Los Angeles Railway Corporation has proved an efficient ally in relieving emergency situations. In the accompanying illustration a temporary bridge has been laid over an obstructing length of fire hose. The



NEW EMERGENCY TRUCK IN LOS ANGELES

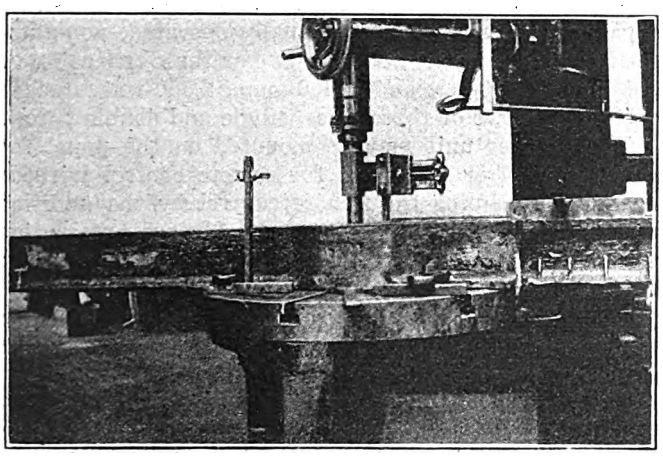
truck has also been used in connection with replacing derailed cars, by coupling on to the car with a heavy chain and then by applying power so as to tow the car back to the track.

The truck is also equipped with a three-section telescope tower designed to facilitate the repair to overhead wires. Other emergency equipment carried includes blocks, tackle, picks, shovels, jacks, crowbars, cables, ropes and lights.

Tool for Facing Heel of Switch

IN ORDER to do away with the expense of making patterns and castings, the Portland Railway, Light & Power Company constructed a tool for boring and facing the heel of a steel switch from steel pieces welded together.

The tool is used in connection with a drill press



DRILL PRESS ATTACHMENT IN POSITION FOR FACING HEEL OF SWITCH

and the back lash of the press is held up by stiff springs under the center of the tool. The heel of the steel switch which was bored and faced was 7½ in. in diameter and 2 in. deep. An accompanying illustration shows this tool in position during the operation of finishing the switch.

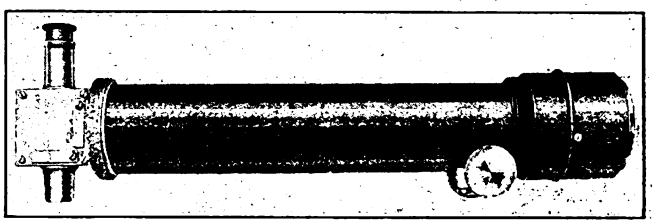
What's New from the Manufacturers

New Lightmeter

A Portable Instrument Designed for the Measurement of Foot Candles, Lamberts, Candles per Square Inch, Candlepower, Coefficient of Reflection, Transmission Factors and for Color Matching

THE accompanying illustration shows a form of lightmeter being manufactured for the Holophane Company by the Keuffel & Esser Company. The direct range of the instrument is from 1 to 15 foot-candles. The photometer head has two slots for inserting absorbing screens, one on the test side of the photometric cube and one on the standard lamp side of the cube. Two absorbing screens are supplied with the lightmeter having transmission factors of 0.1 and 0.01. The range of the instrument with the two absorbing screens is from 0.01 to 1,500-foot-candles. The range can be further increased by the use of additional absorbing screens that can be made to order.

Experience in making illumination measurements in



COMPLETE LIGHTMETER INSTRUMENT

the field has shown that a piece of white blotting paper with the mat surface used to reflect light is the most practical test plate. Ground milk glass test plates when carefully prepared follow the law of diffuse reflection at larger angles to the direction of the incident light than do the blotting paper test plates, but these glass plates require frequent washing under unfavorable conditions and are easily broken. The blotting paper test plate can be discarded when slightly soiled and its cheapness and reproducibility make it ideal for field measurements. A package of twenty-five blotting test plates is furnished with each instrument.

In order to make measurements of foot-candles incident on any plane of measurement, the test plate is placed on the plane of measurement and is viewed through the telescope. The milammeter when set on the arrow indicates that the proper current is passing through the standard lamp. The lamp and battery housing is then moved in or out until the two ellipses in the photometric field as viewed through the eye piece match in brightness. The scale reads directly in foot-candles.

The unit of brightness is the lambert, which is defined as the brightness of a perfectly diffusing surface emitting one lumen per square centimeter. A perfectly diffusing surface emitting one lumen per square foot will have a brightness of 1.076 millilamberts. The lightmeter will therefore read directly in millilamberts by multiplying the scale reading by 1.076. In making brightness measurements the test plate is not used, the surface being viewed directly.

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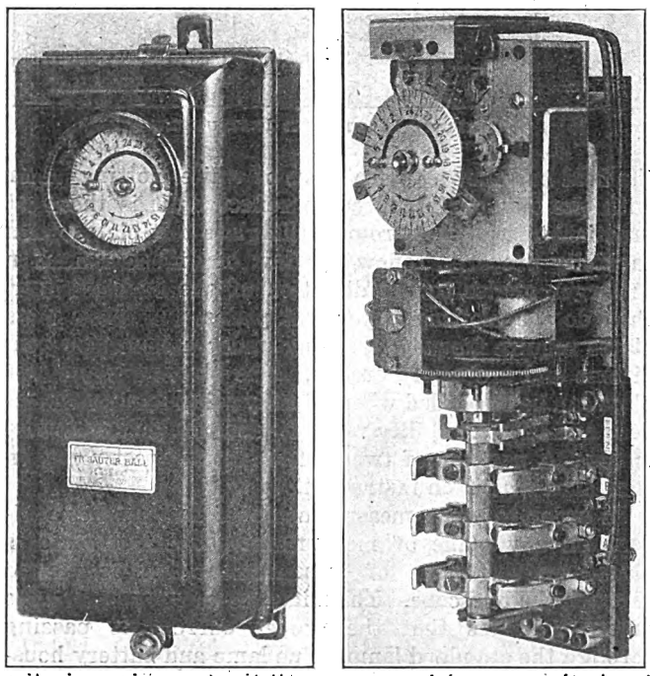
A New Automatic Time Switch

From Switzerland Comes a New Type of Time Switch Interesting for the Engineer Who Is Confronted With Problems of Automatic Electric Current Control

ACCOMPANYING illustrations show a Sauter time switch of 30-amp., triple-pole, self-winding type, which is a Swiss product, the factory being located in Basle. R. W. Cramer & Company of New York, N. Y., are the American distributers. These switches are made in several types and of various capacities, the essentials of design and construction being similar, however, except that in types of capacity exceeding 100-amp. current breaking contacts of an "oil break" type are provided.

The device consists of a quick make and break drum-type switch, operated by a spring which, at each operation, is wound by a small universal motor. The latter is automatically thrown on the line by a lightly acting, small contact switch, operated by the clock dial. The main switch cannot be thrown before its spring is fully wound. The winding of the clock takes place at every operation of the switch, although the energy stored in the spring when fully wound would keep the clock going for four days. The clock mechanism is of substantial construction and has all the refinements found in high precision timepieces. Excessive winding of either spring is impossible. The universal motor is well made and protected against dust and moisture; has carbon brushes and large bearings lubricated by grease cups. The motor runs only a few seconds per operation. The clock move-



AT LEFT, EXTERIOR VIEW OF AUTOMATIC TIME SWITCH. AT RIGHT, VIEW OF INTERIOR MECHANISM

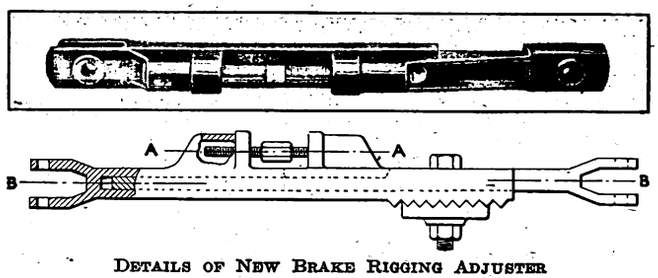
ment is completely inclosed and the entire mechanism is mounted in a hermetically closed metal housing. Padlocking or sealing of the housing is possible because of the self-winding feature.

This type of switch can be used in various types of service where automatic regulation at definite time intervals is necessary, and its use produces increased economy in the control of current. The switch can be used in connection with either light or power circuits, such as station lights, signal lights at crossings, etc.

Detroit Tests New Brake-Rigging Adjuster

A TYPE of brake-rigging adjuster intended to replace the usual form of turnbuckle for taking up slack in brake rigging is being tried out by the city of Detroit, Department of Street Railways. This type of adjuster was designed and patented by Amel B. Broluska.

The adjuster consists essentially of two members which are connected in the brake rigging in a position usually occupied by the turnbuckle. These members



DETAILS OF NEW BRAKE RIGGING ADJUSTER

have jaws so that the brake levers or rods can be attached. In the accompanying drawing the member at the right slides inside that at the right end and the adjustment is made by turning the screw at the top which is provided with right- and left-hand threads. This screw works in two projections at the top of the principal members. After the adjustment is made, the parts are locked firmly in position and the strain is taken off the adjusting screw by clamping with an additional piece provided with teeth which fit in similar teeth on the upper casting. A bolt passes through the right-hand member and this bottom casting, and so securely locks the various members in position. The left-hand member is provided with a slot, so that locking can be accomplished in any location necessary for proper adjustment.

Indoor Oil Circuit Breakers of Moderate Capacity

THE Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces the Type "F-11" line of oil circuit breakers. These are moderate capacity indoor breakers, manually operated, non-automatic and automatic, with one, two or three trip coils. A 200-amp., 4,500-volt and a 400-amp., 2,500-volt breaker are made in two or three poles, single and double throw.

The breaker unit may be mounted on the panel for direct control or on a wall for remote control without change, or on pipe for remote control by the addition of a simple pipe mounting bracket. The same operating mechanism is used for direct panel mounting or remote control breakers.

The breaker opens by gravity, assisted by tension springs, and is equipped with bumpers to absorb all shocks of opening. The open position is maintained by gravity. The tanks are removable without the necessity of disturbing operating mechanism or contacts. There is ample air space at the tank top to allow for gas expansion. Poles are isolated in individual cells by insulated tank liners and partitions.

At the bottom of the stationary contact stud are self-aligning fingers. These fingers have flared surfaces that guide the moving contact during the closing stroke. The most important function of these flared surfaces, however, is to take the arc incident to opening heavy short circuits. This arc is drawn between the flared surfaces and the top edge of the moving contact, leaving

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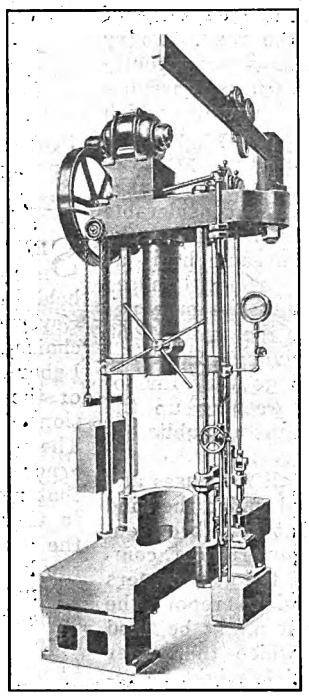
the flat surfaces that are in contact when the breaker is completely closed smooth and clean to carry normal current of the breaker.

New Type Press

THE Watson-Stillman Company, New York, has brought out a new press designed for the many operations of forcing, pressing and bending in electric railway machine shops. Its use provides a rapid and convenient means of pressing axle and armature bearings in and out of their housings, as well as for pressing pinions and collars on and off their shafts. On account of its wide bed, the press is adaptable to many operations of bending and straightening.



NEW 75-TON PRESS

The press is of the reversed cylinder type, having the ram movement from the top downward. The pump is only required for the actual pressure application, the hand wheel as shown providing a means of bringing the ram quickly to and from the work, obviating the necessity of waiting for the pump to move the ram through the idle part of the stroke.

A "U" piece hinged to one of the columns of the press may be easily swung into the center of the press or to one side as required. The jib crane mounted on the top is furnished with a trolley so that a chain hoist may be attached for easily handling the work into and out of the press. A hole is provided in the bottom platen for receiving the shafts, etc. The press illustrated shows a motor-driven pump. The drive can be either by belt through tight and loose pulleys or by direct attached constant-speed motor.

A gage is provided which indicates the pressure on the ram in pounds per square inch and the total pressure in tons. The pump is a two-plunger type and the entire control of the press is through a single screw stem valve. The bottom platen, top platen, cylinder and crane bracket are made of open-hearth steel castings; the ram and rods of machinery steel, and the cylinder is copper lined. The press illustrated is built in a capacity of 75 tons with a ram movement of 21 in. The bottom platen has a total length of 72 in.

Improved Method of Insulating Motor Cases, Field Coils and Armatures

THE L. Robinson Corporation, 8-10 Bridge Street, New York, N. Y., has worked out an automatic insulating flow system for coating the inside of railway motor shells and impregnating field coils and armatures. This company makes a specialty of insulation varnishes, compounds, japans and protective coatings, and it is willing to co-operate with railways that desire to perfect their method of applying these insulating coatings. The method most generally used at the present time consists of dipping the complete motor shell. In such cases it is necessary to scrape off the coating from the outside of the shell, which entails additional labor. Also, except in a few instances, these methods have not been devised with a view of economy in shop space and with facilities to keep the labor down to a minimum.

The automatic insulating flow system provides a method for applying insulation to the inside of motor cases, to the field coils and armatures that is economical in the amount of material used and reduces the labor in handling as several movements are eliminated. Through careful design it is also possible to keep the part of the shop where this work is done in a clean condition, which also reduces the fire hazard to a minimum.

The insulating material used in this treatment is of a nature thoroughly to fill and saturate the assembled armature and field coils, thus filling up all shrinkage cracks in the insulation and winding. The various individual coils of the armatures are thoroughly bonded together and are held in position by the compound and the work can be accomplished without removing field coils from their cases.

Mechanical Engineers Favorable to Use of Pulverized Fuel

THE American Society of Mechanical Engineers recently conducted a canvass to ascertain present professional opinion as to the practicability of using pulverized fuel in power plants. According to the engineers the use of such fuel is warranted not only on account of money saving, but because of its effective help in solving the labor problem.

As to the use of this fuel in existing plants, H. D. Savage, Combustion Engineering Corporation, said that with the exception of the Lakeside station of the Milwaukee Electric Railway & Light Company, the River Rouge plant of the Ford Motor Company and two boilers of the St. Joseph Lead Company, more than a dozen "Lopulco" installations had been made in existing plants. "Powdered-coal installations," he said, "are so flexible in their application as to make it generally possible to apply the system with but slight change in the existing conditions. This is especially true since it is now thoroughly proven that it is not necessary in all cases to dry the coal before burning."

It was the feeling of the engineers whose statements are included in the symposium that the financial and labor considerations were not the only ones in this connection. An important point is the additional capacity which results; still another is cleanliness.

As to cleanliness, W. J. Santmeyer, of the Puget Sound Light & Power Company, says, "Early last year we painted white the main part of a station where we use pulverized coal. This plant has remained clean."

The United States Department of Labor, through the Bureau of Labor Statistics, has completed the compilations showing changes in the retail cost of food from Oct. 15 to Nov. 15 in nine principal cities in the United States. There was a decrease in six of these cities and an increase in two. The year ended Nov. 15, 1921, as compared with 1920, showed decreases of from 20 per cent to 23 per cent. As compared with the average cost in the year 1913, the retail cost of food on Nov. 15, 1921, showed an increase of from 44 to 58 per cent. The cities considered were Chicago, Newark, Cincinnati, Milwaukee, Omaha, Indianapolis, Houston and Portland, Me.

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Indiana Association Meets with the State University

President Henry Urges Revision of Utilities Act to Include Regulation of Trucks and Buses Using Highways for Commerce

ELECTRIC railway men played a prominent part in the second annual meeting of the Indiana Public Utility Association, held Jan. 14 on the campus of Indiana University, Bloomington, Ind., upon invitation of the school of commerce and finance. Charles L. Henry, president of the association, addressed a convocation of all students of the university and presided at the association meeting. Arthur W. Brady, president Union Traction Company of Indiana, read a very interesting paper on the subject "Utilities and the Public."

Mr. Henry in his address made a plea for the extension of the powers of the public service commission, to cover the operation of automobiles and trucks on the highways for commercial purposes. He referred to the act of the Indiana Federation of Farmers' Associations, which adopted resolutions recently demanding that the trucks and automobiles be compelled to help maintain the country roads they are wearing out.

The sessions of the association were held in connection with the school of commerce and finance, whose professors and students were present to take part. Dean W. A. Rawles, of the school, was on the program with a paper discussing the value of business training in the university. This is the first time on record when a great state university and an association of utility owners and operators have met together to arrange a program of educational value. University professors and students, commenting on the program, say that it was worth a great deal to them. Dean Rawles, discussing the question, said:

"The public utilities constitute one of the most important industries of the country. Their activities concern nearly everyone. Upon their service the people in their daily lives are dependent for their comfort, convenience and safety. Hence, there is a universal interest in this business. A mutual understanding of the rights of the public and the problems of the utility companies should eliminate friction."

Some of the remarks from Mr. Henry's presidential address follow:

"The Public Service Commission of Indiana today has jurisdiction only over the electric railways, gas producing companies, electric light and power companies and telephone companies. It will at once be recognized that there are many others that are performing a public service for compensation which are not included in this list. In that regard, the law needs a very thorough, careful and complete revision. I will not undertake to enumerate all the things not now included under the jurisdiction of the commission which should be, but I desire to call attention to one class of utilities that should be under the control of the commission, and at the same time required to pay the state a reasonable compensation for the privileges which they enjoy.

"In the old days of toll roads a man had to pay 2½ cents per mile toll for the privilege of driving a two-horse wagon, with the probable capacity of about one ton, over the road. Today we have going up and down our recently improved highways, trucks carrying loads of five tons and upward which greatly damage the highways, without paying anything for the privilege granted them and without paying taxes in any community, to any considerable amount whatever. If the five-ton trucks were today put on the same basis as the old toll charges, for one hundred miles a day at 2½ cents per mile per ton, they would pay to the state $12.50 each day for the privilege they are enjoying, which would go very far toward the expense of keeping up the highways now being built at public expense.

"The same kind of toll for buses and autos could be enforced under the kind of tax regulation that has been enforced by the general government, compelling the bus owners, the auto owners and the truck owners, to report the amount of travel; or it might be fixed by a graded license which the owner or the user of the vehicle might be required to pay. Such an arrangement would be perfectly just and fair. These people are as much operators of public utilities as the steam railroads or the electric interurban lines of the State, and they should not be allowed to wear out our highways without compensation."

New York Electric Railway Association

ACCORDING to President W. O. Wood, of the New York Electric Railway Association, present indications point to a good attendance at the mid-winter meeting of the association, to be held at the Hotel Astor on Jan. 24. The program includes topics of interest to all branches of the industry, executive, transportation, engineering, accounting and legal, and it is hoped that the attendance will include representatives from each branch, as well as from regulatory commissions.

The technical sessions will begin at 10 a.m., and, with an intermission of one hour for lunch, will continue during the day. The papers to be presented are as follows:

"One-Man Car Operation with Double-Truck Cars"; (*a*) reason for use of double-truck cars, (*b*) application of turnstile to cars, (*c*) application of safety devices to cars.

Paper by H. S. Sweet, Engineer of Equipment, New York State Railways, Utica, N. Y.:

"Workmen's Compensation Claims as a Continuing and Increasing Liability to Railway Companies."

Paper by Marten E. Burke, assistant general attorney, Interborough Rapid Transit Company, New York City.

"One Year's Experience with Cost-of-Service Plan in the City of Rochester, N. Y."

Paper by Charles R. Barnes, commissioner of railways, City of Rochester, N. Y. (formerly electric railway expert, Public Service Commission, Second District, State of New York).

There will be an informal dinner in the evening. The speakers will include Hon. Fred S. Purnell, member of Congress from Indiana, who will speak on "The Turn of the Tide in American Problems of Today." There will be singing by the Manhattan Quartet.

Anti-Strike Law Predicted

SPEAKING at the third annual dinner of the New York Railroad Club, held Dec. 15, Ben. W. Hooper, former Governor of Tennessee and now vice-chairman of the United States Railroad Labor Board, declared that the survival of the country depended on the solution of the issues of capital and labor. The unionized railroad worker, Governor Hooper said, should understand that morally, at least, he has no right to tie up the roads and inconvenience the general public. If this is not now the law, it ought to be, and it will be, adding that if such an anti-strike law came into being there should be constituted an absolutely impartial tribunal to decide the question between the employers and the employed.

The problem in this country today is not how to stamp out and destroy organized labor, but how to deal with its just demands fairly and humanely and how to curb its unjust demands and control such of its activities as threaten the public welfare. He said:

"Friendly as I am to theory and principle of organized labor, I am profoundly awed when I contemplate its possibilities for evil. On the other hand, if organized labor confines its efforts to the legitimate advancement of a just and reasonable wage, the establishment of desirable working rules and conditions, the maintenance of an increasingly good standard of living and preservation of the political and civil rights of labor, then will organized labor not only serve its own interests, but it will constitute one of the bulwarks of the American Republic."

The people of the United States, he pointed out, must have efficient and uninterrupted railroad service. The employees must share with the carriers the execution of this public trust. When a man enters the employ of the railroad, and every day that he is so engaged, he should understand that in a high sense he is serving the public. He should understand that whatever rights men may have to strike and tie up a strictly private business, they have no such right, morally at least, to tie up the railroads and destroy the property, business

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health, comfort and lives of innocent men, women and children. The millions of dollars wasted by both sides in industrial warfare should be saved to enlarge the income of the carriers and wages of employes or to diminish the rats paid by the people.

Reviewing the board's twenty-one months of work, Vice-Chairman Hooper recounted its accomplishments, and bringing his review down to the threatened national rail strike threat, said that while this may have been an opportune time to fight the labor union, the price of this fight would have staggered the nation. This country has never experienced a general railroad strike, and but few men have any adequate conception of the ruin and misery it would bring to the people.

American Association News

Committee Busy on Applied Psychology

THE T. & T. Association committee on personnel and training met in New York City on Jan. 18 and blocked out a definite program for this year's work. The committee had been instructed by the executive committee to carry out the recommendations of last year's personnel and training committee, particularly with reference to mental tests of applicants, and training of one-man car operators.

In general the program was divided into four parts: (1) First elimination tests, including general observation of applicant and preliminary mental rating; (2) formal application, for which a suggested standard form will be prepared; (3) second elimination test, involving oral questions and answers to permit a general "sizing up" of applicant and an imparting to him, informally, of the ideals of the company as to service; (4) medical examination and final mental tests, for which specifications will be drawn and a suggested record form prepared. The committee also plans to suggest a standard card form for permanent filing of applicants' and employees' records.

Dr. John Leeming was appointed chairman of a sub-committee to secure information on the functions required to be performed by motormen and conductors and the qualifications needed for the proper performance of these functions. His committee will also frame sets of mental tests for consideration at the next main committee meeting.

Chairman J. E. Wayne undertook to secure sample forms for application, medical examination and permanent record and to investigate the subject of one-man-car operator training. All members of the committee are to send Dr. Leeming their detailed suggestions for his sub-committee, forwarding copies to all other members of the main committee.

In order to focus its thinking in the preparation of its report, the committee formulated its plans tentatively in the following statement: "Basing our efforts on the work of last year's and preceding committees, we aim primarily to suggest concrete detail of physical examinations and mental tests as a step toward the development of a standard of procedure in selecting and training transportation department employees."

The meeting was attended by J. E. Wayne, vice-president York Railways, chairman; F. L. Butler, Atlanta, Ga.; Arthur Gaboury, Montreal, Que. (sponsor); Dr. John Leeming, Chicago, Ill., and H. H. Norris, ELECTRIC RAILWAY JOURNAL, members of the committee. There was also present by invitation, N. L. Hoopingarner, City Club, New York City, an expert on applied psychology. The next meeting of the committee will be held in March.

Joint Meeting of One-Man-Car Committees Held

THE committee on one-man car operation of the Transportation & Traffic Association and the committee on unification of car design of the Engineering Association held two-day sessions at association headquarters in New York on Jan. 12 and 13. Individual committee sessions were held the first day and the second day was devoted to a joint session. Those present for the committee on one-man car operation included: C. E. Morgan, Brooklyn City Railroad, chairman; C. W. Kellogg, Boston, Mass., and D. A. Scanlon, Akron, Ohio; and for the committee on unification of car design: H. H. Adams, Chicago Surface Lines, chairman; H. A. Benedict, Newark, N. J.; J. A. Brooks, Philadelphia, Pa.; John Lindall, Boston, Mass.; G. L. Kippenberger, St. Louis, Mo., and Victor R. Willoughby, New York City.

The T. & T. Association committee went over the city operating rules and made the revisions and additions considered necessary to care for the conditions resulting from one-man operation. Operating rules for suburban service will be taken up at a future meeting.

The committee on unification of car design discussed various phases of car construction and considered condensed data on dimensions of double-truck cars for city service presented by the chairman. This information was tabulated from the returns from a questionnaire sent to the members of the committee. It included various governing dimensions for such double-truck cars. The data were classified under single-end motor cars, double-end motor and trail cars, front-entrance and center-exit motor cars, center-entrance, motor and trail cars, and end-entrance-and-exit and front-exit motor cars.

An analysis of some of the principal controlling dimensions showed the committee that the variation in many instances was small and there appeared to be no great obstacle in deciding on a uniform design that would be satisfactory in all cases. After discussion, the committee selected certain types of construction and dimensions that could properly form a basis for car design and furnish a starting point for further investigation and discussion. These were confined to design of double-truck city cars where transverse seats were used. Tentative dimensions for post centers, width over posts and extremes widths were agreed upon as were also some details of design in connection with lower and upper sash.

The number of windows, which also governs the seating capacity of the body of the car, was also determined in connection with the desirable motor capacity for this type of service. Other important considerations in design, such as platform length, maximum height of first step with a specified diameter of wheels, and consideration as to when flush and drop platforms would be necessary were also outlined. The desirable height of window opening was left for decision after an investigation which is to be made by Messrs. Adams and Lindall. A tentative design covering the suggestion is to be drawn up and stress diagrams are to be made by Mr. Willoughby.

At the joint session of the two committees held Friday, the essentials of one-man car design which appeared necessary from an operating standpoint were discussed in detail. The committees agreed on certain essential devices which should be incorporated on all cars operated by one man. The committee also discussed the present tendency toward the use of a car somewhat larger than the present safety car operated by one man, and also the demands for a still larger capacity car which could be operated by either one man or two men as traffic conditions require. In these larger cars, the committee considered it desirable to provide liberal width of aisle and passageways so as to facilitate the movement of passengers in interchange and toward the rear of the car.

This joint meeting of the two committees brought out many valuable suggestions which will be used in future consideration and discussion.

Hotel Accommodations at Indianapolis

THE official headquarters of the American Association during the Midyear Meeting, to be held in Indianapolis on Feb. 28, will be the Hotel Claypool. Reservations of rooms should be made promptly. The following hotels are conveniently located with respect to headquarters and are recommended as satisfactory: The Lincoln, across the street from the Claypool; the Severin, and the Washington.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Wages Cut in Milwaukee

Reduction Averages About 8 per Cent—Motormen Have More Difficult Job than Conductors

As a result of negotiations between the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., and committees representing the company's employees as organized in the Employees' Mutual Benefit Association, the employees have agreed to a reduction in wages which will average about 8 per cent. The cut became effective on Jan. 1, 1922. In terms of cents per hour the reduction will range from 2½ to 14 cents. Trainmen now in the employ of the company will be cut approximately 5 cents an hour.

Under the wage scale in effect during 1921 motormen and conductors on city lines who had entered the service prior to May, 1921, were receiving 55 cents an hour during the first year of service, 58 cents during the second year, and 61 cents during the third year and thereafter. The wages of these men will be cut 5 cents an hour; that is, to 50, 53 and 56 cents, depending upon length of service.

In hiring trainmen subsequent to Jan. 1, 1922, the company plans to differentiate between motormen and conductors, the idea being that because of constantly increasing responsibility and other contributing factors the motorman has the more difficult and important task to perform. It is also planned to abolish the term "conductor" and instead to use the term "collector."

With this in mind the scale of pay for men hired subsequent to Jan. 1, 1922, will be as follows: City motormen, 45 cents an hour during the first year of service, 47 cents the second year, 49 cents the third year and thereafter; city collectors, 40 cents during the first year of service, 42 cents the second year and 44 cents the third year and thereafter. The wage scale of interurban motormen, conductors and collectors will continue to be 2 cents an hour higher than that of city men.

In so far as new men are concerned, however, here also a differentiation will be made between the work of motormen and collectors. One-man car operators will continue to receive 5 cents an hour more than other city trainmen. The largest hourly cut, that of 14 cents an hour, will be made in the wages of common labor. Of course, most of the employees, including practically all of the transportation department employees, will continue to participate in the prevailing profit-sharing plans, which will continue to give them monthly compensation additional to that received as wages.

In a statement issued just prior to the conclusion of negotiations for the wage cut, the president of the Employers' Mutual Benefit Association pointed out that in April, 1919, the association entered into a general labor contract with the Milwaukee Electric Railway & Light Company and its associated companies. Under the terms of this contract the companies agreed to deal collectively with the employees concerning wages, hours and working conditions and to adjust wages semi-annually in accordance with the increase or decrease in cost of living as shown by an agreed index number.

WAGES ADJUSTED FROM TIME TO TIME

The scales of wages in the various departments of the company have been adjusted upward from time to time since the general labor contract was entered into. These increases were covered for each department or division or a department by supplemental agreements running for definite periods. All of the supplemental agreements expired on Dec. 31, 1920. The association was able to negotiate, however, a continuation of wage schedules then in effect on the showing, that it was able to make, as to the treatment of wage scales by other utilities and by the steam railroads in the light of local conditions.

The association at this time pointed out that its members had suffered a longer delay as compared with employees in other industries in getting wage increases during the period of the war. For that reason the company continued the then existing wage scale for employees then in service until Jan. 1, 1922, when it served notice on the association that it wanted to negotiate a reduction in wage rates. Negotiations were conducted which resulted in a cut in the company's pay roll above described.

New Equipment to Provide Competition with Buses

Judge John M. Killits recently authorized J. Frank Johnson and Harry A. Dunn, receivers for the Toledo & Western Railroad, Toledo, Ohio, to order new equipment for suburban traffic.

The plan is to provide competition for interurban bus lines now operating parallel to the line. The receivers also want to give better service to a community that is providing operating revenue for the company from electric light and power business along the right of way.

When the new equipment for suburban traffic reaches Toledo the passenger tariffs will be reduced about 40 per cent, the receivers have announced.

Houston Franchise Advanced

$1,200,000 to Be Spent Under Grant Extended for Sixteen Years—Seven-Cent Initial Fare

Final passage and adoption of the new railway franchise in Houston, Tex., would appear to be assured. Under the new grant the Houston Electric Company will receive what is a virtual sixteen-year extension of its present franchise, in return for which the company agrees to spend $1,200,000 within two years for additions, replacements and betterments to its city service.

The ordinance extending the franchise was passed on first reading during the week ended Jan. 14 and will come up for second reading at the next meeting of the City Council, and one week later will come up for third and final reading and final adoption.

Under the provisions of the new franchise the railway binds itself to spend within two years at least $1,200,000 for additions, replacements and betterments to its service. The extension is forfeitable if the company fails to spend this sum.

In addition to its present gross receipts tax, the company is to pay the city $500 for the extension. When the extension has expired the city may purchase all, but not less than all, of the traction property upon the payment of the "fair valuation thereof." Universal transfers are provided for.

The company agrees to pay not in excess of $5,000 each year to be used to employ "competent persons" to work with the ex officio public service commissioners.

A penalty of $100 a day is provided if the company fails to furnish efficient service at reasonable rates, or fails or refuses to maintain its properties in good order, and the company recognizes the right of the city to pass penal ordinances for the enforcement of provisions of this section.

Attached to the franchise ordinance is an ordinance prescribing the fares to be charged. These are:

Seven cents for persons over twelve years, or four car tickets for 25 cents. Children between five years and twelve ride on a child's ticket, sold two for 7 cents; children under five free. Policemen and firemen in uniform, free. Students not more than seventeen years old, attending academic, public or private schools of high school grades or lower can buy books of twenty tickets for 70 cents for use during school months.

New fares take effect on the date the company files its acceptance of the extension of the franchise, which must be within thirty days after the franchise ordinance is put into effect.

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Politicians Active in Chicago

As a Result Messrs. Insull and Blair Both Appear Before Local Transportation Committee With Offer to Sell to City—"L" Comes in for Special Attack.

Chicago's City Council has started a fight on the elevated lines by passing a resolution ordering Mayor Thompson to take steps at once to bring the rate of fare down to 5 cents, as fixed by contract, and to obtain better service. Up to this time, the anti-traction activities of the city hall have been centered upon the Chicago Surface Lines, but the local transportation committee's chairman is the leader in a demand to know why the "L" has been favored by the city administration.

AS A SPECIFIC item of contention, the question has been asked why the Oak Park "L" has not been forced to pay $197,694 owing to the city for six years for its share of the cost of the Lake Street bridge. There have also been numerous letters published in the newspapers from people complaining about the service and showing a very antagonistic attitude.

To defend itself against some of the untruths that have been spread broadcast, the elevated lines have been posting short informative statements in the elevated cars and running newspaper advertisements. In this advertising, thus far, the Chicago Elevated Railroads has compared the service given in Chicago with that on other rapid transit systems, showing that the passengers per car mile, (intended as a measure of the congestion) is 3.68 in Chicago, 6.09 on the New York subway and 5.65 on the New York elevated. It is also pointed out that the average speed of express trains in rush hours is 16.89 m.p.h. on the Chicago elevated lines, 16.80 m.p.h. on the New York subway and 16.29 m.p.h. on the New York elevated. In another advertisement the disposition of the fare which, for the nine months ending Sept. 30, 1921, averaged 9.8 cents per passenger, is given as follows:

Labor	5.25 cents
Materials	0.71 cents
Power	0.78 cents
General and miscellaneous	0.50 cents
Replacement reserve	0.27 cents
Taxes	0.71 cents
Rentals	0.22 cents
Total	8.44 cents
Average fare	9.28 cents
Operating costs	8.44 cents
Left for return on investment	0.84 cents

It is pointed out that this return is at the rate of 2.73 per cent per annum on the valuation of $86,250,000 placed upon the elevated railroads by the Public Utilities Commission in January, 1921, after an appraisal of the properties.

Mr. Insull Ready to Sell to City

The reason the Oak Park Elevated has not paid its share of the cost of the Lake Street bridge is explained by showing that the operating deficit on this road was $39,633 in 1918, $123,604 in 1919, $206,037 in 1920 and $113,989 for eleven months of 1921. The city did not wish to accept receiver's certificates in payments of its claims, and therefore the Oak Park "L" is paying the city at the rate of 5 per cent annually on the deferred payment.

Samuel Insull, chairman of the board of directors of the Chicago Elevated Railroads, appeared before the committee on local transportation last week and said that the elevated companies were ready to listen to any reasonable proposition that may be made by the City for purchasing or taking over the lines. Interchange of business between surface and elevated lines or the unification of all of these and a subway, if built, into one system, were urged and recommended by Mr. Insull.

Subway Downtown Favored

He favored the construction of a subway through the downtown district as soon as it can be built. This would be the first step in developing the rapid transit system. Mr. Insull called attention to the report of the Chicago Traction & Subway Commission. This, he said, formed excellent material on which the committee could begin the working out of improved transportation for the people of Chicago. He said the report was as good to-day as it was when written four years ago. He thought subways should be built by the community and that he was not opposed to the creation of an agency, such as the Sanitary District, to carry out the work, presumably referring to Mayor Thompson's efforts to create a traction district. It was his belief that the capacity of the surface and elevated lines could be tripled by joint operation, including certain re-routing of surface lines, extension of elevated platforms, etc. He said he thought it would be impossible to work out any scheme of final settlement without legislation and he doubted the wisdom of submitting any definite plan to the committee, as this ought to be left to a committee of prominent engineers not interested in the local traction systems.

Mr. Blair Also for Unification

A few days later, Henry A. Blair, president Chicago Surface Lines, appeared before the local transportation committee and laid before it a plan by which he believes the city can secure a rapid transit subway, the unification of all transportation facilities and ultimate acquisition by the city of the surface lines, elevated roads and subways. Like Mr. Insull, he urged that the traction problem be taken out of politics and that those interested get down to business. Mr. Blair's plan would provide for what is virtually a service-at-cost franchise, made probably for a twenty-year term, whereby the rate of fare would automatically be adjusted up or down to fit changing conditions.

Mr. Blair would have joint operation of the surface, elevated and subway railway facilities by the companies and the city, under the management of a board of control consisting of four representatives of the railways and three of the city. The plan contemplates the acquisition of the properties by the city of Chicago by outright purchase at any time during the life of the agreement, or by gradual amortization of the capital account of the companies out of the city's share of the earnings.

It is proposed that when the city's share in ownership, through this amortization plan, amounts to 50 per cent of the total value of the property, the city may take it over subject to the unamortized portion of the capital account of the companies and the stipulated annual return thereon.

It is contemplated that the companies should receive a fixed annual return for the use of their properties of 7 per cent interest on the then unamortized portion of the capital account. All residue receipts, after payment of operating expenses, maintenance of the necessary reserve funds and the annual stipulated return on the capital account of the companies, would be set aside by the board of control for the account of the city and be applied by the board to new construction and amortization of the capital account, so that within a reasonable time the city might acquire ownership of the properties free from debt.

8,861,028 Fewer Passengers in St. Louis

Revenue of United Railways, St. Louis, Mo., in 1921 was $656,784, or 3.26 per cent less than in 1920, according to a summary given out by A. T. Perkins, manager for the receiver. In 1921 the revenue passengers totaled 282,447,190 as compared with 287,405,837 the previous year, a decrease of 3.26 per cent in numbers. Transfer passengers in 1921 totaled 150,562,354 as compared with 154,464,735 in 1920, a falling off of 2.53 per cent. The aggregate decrease was 8,861,028, or 2 per cent in the passengers carried.

Travel began to fall off early in the year and continued steadily to decrease until December when there was a slight upward trend toward normal. During the year the loss was principally on lines serving the industrial districts. Saturday and Sunday pleasure travel showed a heavy loss. The total passenger revenue in 1921 was $19,457,015, as compared with $20,113,779 in 1920. The fare is 7 cents straight for adults and 3 cents for children.

January receipts so far are slightly better than the December record, indicating a slow process towards recovery. Manager Perkins believes the increase will continue, and is preparing to ask the Federal Court to grant permission for the construction of fifty new motor cars this year.

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Steel Versus Wooden Cars

Speed Control System to Be Tested for Use in Rapid Transit Service in New York

The investigation by the New York Transit Commission into the collision which occurred on the Ninth Avenue elevated structure on Dec. 30 has brought out some interesting facts relating to the life of wooden cars, their safety compared with steel cars, and the weight and construction of both types of cars, and the possibility of installing safety devices to prevent accident.

In this investigation the commission has devoted its efforts more particularly toward finding methods for preventing similar accidents in the future. In the testimony presented relating to the cars which are now being operated on the elevated lines in Manhattan and Brooklyn, it was stated that the Interborough Rapid Transit Company is now operating a total of 2,213 elevated cars, 721 of which are trailers, and the Brooklyn Rapid Transit Company, 917 cars, of which 269 are trailers. Seventy-eight of the trailers used by the Interborough were purchased in 1878, so they have been in service for forty-three years. The oldest motor cars in use consist of 60 purchased in 1881. In Brooklyn the cars which have seen the longest service consist of 60 trailers which were built by the Pullman Company in 1884. All of these cars were used in steam service with the dummy engine originally used on the elevated structures and were remodeled and equipped for electric service at the time of the electrification of these lines. The first electric train was run on the Manhattan Elevated Nov. 22, 1900. The accompanying table gives information regarding old types of trailers and motors cars with the year in which they were purchased.

Testimony given by the various railway engineers before the Transit Commission indicated that in addition to the large financial outlay necessary to replace the wooden cars with steel cars, there would also be an additional expense for reinforcing the present elevated structure and in some cases it would be necessary entirely to rebuild it. The comparative weights given by George H. Pegram, chief engineer of the Interborough Rapid Transit Company, were that the all steel cars now used in the subway average about 85,000 lb. light. Composite cars used in Second Avenue and Third Avenue elevated express service weigh 73,000 lb. unloaded, while the wooden cars in general use on the elevated lines weigh 68,000 lb. Mr. Pegram also stated that in order to get a steel car which could be operated on the elevated without reconstructing that structure would necessitate a reduction in strength of the car frame so that the wooden car would be much safer.

In the case of steel vs. wooden cars, Mr. Pegram said in reference to the comparative safety in collision, the wood type of construction had a greater cushioning power for absorbing impact.

Testimony of other experts indicated that there would be more liability of the steel car being thrown from the elevated structure in case of a collision than there would if the wooden type of construction were used. The advantage of steel cars for this service lies in their fireproof construction, and except in care of fire it was generally considered that the wooden car was just as safe. In regard to the fireproofing of wooden cars, testimony indicated that present methods were not satisfactory and that the present fireproofing consisted of use of asbestos underneath and copper on the sides of the car. The estimated cost for replacing present rolling stock with steel cars is about $7,000,000.

ROLLING STOCK ON ELEVATED RAILWAYS IN NEW YORK

Interborough Rapid Transit Company

Year	Trailers	Motors	Total
1878	78	....	78
1879	143	....	143
1880	45	....	45
1881	40	60	100
1882	71	....	71
1885	43	....	43
1886	...	4	4
1887	...	233	233
1891	...	96	96
1893	...	73	73
1902	8	43	51
1903	...	306	306
1904	99	476	575
1907	...	82	82
1908	115	....	115
1909	19	....	19
1910	...	59	59
1911	60	20	80
1912	...	40	40
Total	721	1,492	2,213

Brooklyn Rapid Transit Company

Year	Cars	Year	Cars
1884	82	1900	5
1887	102	1901	50
1888	78	1902	118
1889	47	1903	100
1891	18	1905	100
1893	73	1907	100
1898	44		
Total			917

Frank J. Sprague was among the experts called in to give information in regard to signal devices and a speed control system for trains. He told of the automatic train control system which he had invented and of tests which soon are to be made by the New York Central Railroad. Testimony by the operating company's engineers and those of the commission indicated that one of the prime essentials of such a signal control system would be provision that trains could close in on each other at reduced speed instead of forcing them to come to a stop. The very short headway operated on New York lines during peak periods makes it inadvisable to use any system which requires trains to stop with fixed distances between them, as this would slow up transportation and reduce the capacity of the road. The recommendation of the commission was that tests of various signal control devices be made in an endeavor to develop a system which would be satisfactory for the service conditions to be met.

Transit Law Valid

Commission Act Passed at Last Session of New York Legislature Upheld by Court of Appeals

In a unanimous decision rendered on Jan. 17 the Court of Appeals of New York held that the Transit Commission act passed by the Legislature of 1921 was constitutional and that the Board of Estimate and Apportionment of New York City must hand over to the Transit Commission the sums it had asked for from the board, amounting to $360,895.78 and $1,083,327.

The Board of Estimate declined to honor these requisitions, and the Transit Commission applied to the Appelate Division, First Department, for an order requiring the board to make such an appropriation. Again the board refused, and took the case to the Court of Appeals, which has now upheld the constitutionality of the act. It is understood that the case will be further appealed to the United States Supreme Court.

Judge Chester B. McLaughlin wrote the opinion of the court, in which Chief Judge Hiscock, and Judges Pound and Andrews wholly concur, while Judges Hogan, Cardozo and Crane concur in the result.

Judge McLaughlin selected four of the chief points raised by the city of New York and centered his argument against them. He first took up the charge that the Transit Commission act violates Article XII, Section 2, of the Constitution.

Judges Hogan, Cardozo and Crane concurred in the result of Judge McLaughlin's decision on the ground that the Transit Commission act, even if it could be held unconstitutional and void in some particulars or contingencies, is not unconstitutional and void in its entirety; that Section 14 of the act imposing upon the Board of Estimate & Apportionment the duty to honor the requisition of the commission, and vesting the Appellate Division with jurisdiction to enforce compliance with that duty is a valid exercise of legislative power, and that the orders under review are, therefore, right and must be affirmed.

The dissenting judges reserve their judgment on the question how far the rights of the city of New York in railroads which it owns may be divested or modified under Article VI of the act until that article has been passed upon in conformity with Article VII, Section 3, of the Constitution of the State, since a decision as to the scope of the last mentioned section is not necesary to the determination of the appeal. They held that questions involving "city rights" may be affected by circumstances and contingencies which are now only imperfectly disclosed.

The act creating the new commission, in addition to amending the Public Service Commissions law in certain respects, and in addition to vesting in the Transit Commission certain regulatory functions, and all the powers and duties under the Rapid Transit act of 1891, as amended, vests in the Transit Commission, by Article 6, the right and

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duty to prepare a plan of readjustment for the relief of the emergency which is declared to exist, the new plan to accomplish three purposes.

1. The combination, rehabilitation, improvement and extension of existing railroads, so that service thereon may be increased and improved to the fullest extent possible.
2. The receipt, as soon as practicable, by the city of sufficient returns from the operation of the railroads that the corporate stock or bonds issued by the city for the construction of rapid transit railroads may be exempted in computing the debt-incurring power of the city under the Constitution of the State.
3. The assuring to the people of the city the continuous operation of the railroads at the present or lowest possible fares consistent with the just valuations of the railroads and their safe and economical operation.

The court said that the method by which these purposes are to be accomplished is specifically pointed out in Section 107. Furthermore it pointed out that:

The commission is not authorized to make any new contract or modify any contract for the construction, equipment, maintenance of operation of the railroads, or any of them, without the approval or consent of the local authority, where such new contract or modification of an existing contract requires to carry it out the authorization by the local authority of corporate stock or bonds of the city in addition to the corporate stock or bonds required to carry out such existing contract.

The contentions of the city as restated by the court were:

1. That the act violates Article X, Section 2, of the Constitution.
2. That the act is unconstitutional in that it violates Article 12, Section 2, the claim in this respect being that the act is a special city law, since it does not apply to all cities of the first class, and could not, therefore, become a valid legislative enactment because it was not transmitted to the Mayor of the city of New York before it was passed.
3. That the act violates Article 3, Section 18, of the Constitution, the contention being that the act applies only to cities having a population of more than 1,000,000; that the powers specified in the act are to be exercised and carried out only by the transit commissioners of the First District, which includes only the city of New York; that New York is the only city of the State having a population of more than 1,000,000, and it therefore follows that the act is limited to such city and becomes a local law.

Under these three heads the court held in substance as follows:

1. The assertion is unfounded that the Transit Commissioners are city officials within the meaning of that provision, and has, in effect, been so determined by this court. They are not city officers. The fact that they happen to be at the present time considering rapid transit solely for the city of New York does not necessarily make them officers of that city. The power formerly given to and vested in the Rapid Transit Commissioners was transferred to the Public Service Commissioners, and under the act now under consideration it has been transferred to the Transit Commissioners. The Legislature had a right to make these changes. (People ex rel. Simon vs. Bradley, supra.)
2. If the act be a special law, then the claim is well founded. I am of the opinion, however, that it is not a special city law, and this court, in effect, so decided in Admiral Realty Company vs. City of New York (206 N. Y., 110 140). It is true that in that case the statute under consideration was the Rapid Transit act, which became a law before this provision of the Constitution went into effect, but the decision of this court, as appears from the opinion delivered, was not put solely upon that ground.
3. This reasoning is plausible, but fallacious. The act is general in terms. It applies to all cities in the State having a population of 1,000,000 or more. It may be conceded that at the present time it is applicable only to the city of New York, but, if so, it by no means follows that it was intended only for that city, since there may, and probably will in the near future, be one or more cities to which it will be applicable. Certainly there is no conclusive presumption to the contrary.

Richmond Men Strike

Recent Wage Cut Rejected—Attempts at Arbitration Fail—Railway Resuming Service

Three days of negotiations have failed to settle the strike which has practically suspended service over the lines of the Virginia Railway & Power Company. Reports indicate that the strike, which took place at midnight on Sunday, Jan. 15, was practically unanimous in Richmond and Portsmouth, about 60 per cent effective in Norfolk and that the men in Petersburg refused to go out.

Service Being Restored

The company has refused to hire strike breakers, but has taken on some former employees and is running a few cars in each city. Service in Norfolk on Jan. 18 was reported 60 per cent normal, with less than that in Portsmouth. Normal service is given in Petersburg, but the interurban line between Richmond and Petersburg is giving only an occasional car.

In Richmond cars were in operation on Jan. 18 and the company promises to add to the number from day to day.

Efforts of the City Council and of Mayor George Ainslie to bring about arbitration have failed. The company through President Thomas Wheelwright has declined to enter into arbitration on the wage question unless the same arbitrators are empowered to fix fares and so provide the income to meet the wages. The Council holds that it is powerless to delegate this power and announced that it has no intention of being hurried in its deliberate consideration of a new blanket franchise to take the place of a number of grants under which the company is now operating, and which have from five to twelve years to run.

The strike results from an order of the company posted Jan. 1, and effective on Sunday night, Jan. 15, at midnight, reducing wages from 15 to 20 per cent to the following scale:

First-year men, 30 cents an hour; second year, 35 cents an hour; and over two years, 40 cents. Five cents an hour is added to this scale for operators of one-man cars and for employees of the interurban division. Shop and station employees are cut a straight 10 per cent. On this scale beginners in platform work on a ten-hour schedule make $3 a day and older men working one-man cars make $4.50 a day.

Richmond experienced a disastrous railway strike in 1903 which paralyzed business for several weeks and caused enormous loss, finally resulting in the complete victory for the company and the breaking up of the union. Following this the men there remained unorganized until during the war.

Autos Called Into Service

The radical difference noted by every older citizen in comparing the two strikes is that in this tie-up there has been little interruption of business. Employees are getting to work on time. Three or four hundred jitneys are in regular operation and thousands of private cars are doing their bit to help along. The only inconvenience experienced is among those living in the suburbs where jitney lines have not been organized.

The strikers are running jitneys with placards announcing that payments made to drivers are being donated to the strike fund. Members of thirty-eight other unions affiliated with the American Federation of Labor and twenty-one railroad unions not affiliated are to be assessed to aid in the strike fund.

The company is said to be making a very large profit on its light and power business, but claims to be losing money on the railway divisions. According to its statement it lost $550,000 last year on its operation of cars in Richmond, Norfolk, Portsmouth and Petersburg, but city authorities are preparing to retain expert accountants to examine the company's books to substantiate this claim.

A proposition from Mayor Ainslie to increase the fare from 6 to 7 cents pending the outcome of arbitration, the men to go back to work at once, and the whole question of wages to be submitted to arbitration, the board of arbitrators also to report to the city council what will be a reasonable fare to be charged, was promptly rejected on Jan. 18 by both the company and the strikers.

Company Explains to Public

The company in a published advertisement asserts that its traffic is falling off rapidly due to jitney competition and the wide extension of private automobiles, and that the deficit for this year bids fair to be larger than that of last year. Unless the profits of the light department are sufficient to carry this burden the company will, indeed, be faced by a very difficult situation.

January 19, the fourth day of the strike, showed no change in the general situation. The company then had eighteen cars in operation in Richmond and the striking motormen and conductors were operating several hundred jitneys. Efforts at mediation have failed and the company has posted notices to the effect that men who do not return to their posts by Friday will be considered discharged and that thereafter it will proceed to fill their places. A number of agencies have offered to furnish men to replace the strikers, but so far no men from out of town have been put to work.

So far the strike has been orderly and the union men have behaved in good spirit. The city attorney held on Jan. 19 that former railway men operating jitneys must secure licenses and that they charge no regular fare and all donations are regarded as contributions to the union.

There has been no serious disorder, though the police have made a number of arrests for minor offenses. The cars of the company are carrying very few passengers.

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Des Moines Case Argued

Iowa Supreme Court Expected to Rule Next Month on Recent Franchise Election

The entire bench of the Iowa Supreme Court, consisting of seven judges, during the week ended Jan. 14 heard the arguments of the attorneys in the Des Moines City Railway franchise case brought upon appeal from the district court of Judge James C. Hume. In the lower court Judge Hume had granted an injunction to prevent the holding of the franchise election, but upon appeal to the Supreme Court on a writ of supersedeas the election was permitted.

H. W. Byers, former corporation counsel for the city of Des Moines, appeared for Grant Van Horn of the North Des Moines Improvement League, which sought the injunction. Mr. Byers contested the proceeding on the grounds of the illegality of the election through improper publication of the notice calling the election. He also claimed that his client had a vested interest in the old franchise which permitted him to ride for 5 cents, and further that the new franchise contained certain provisions which are unconstitutional. Judge W. E. Miller, corporation counsel, appeared for the city and denied that Mr. Van Horn had any vested interest in the franchise, citing an Arkansas decision that a street railway rider did not have such interest.

DECISION EXPECTED IN FEBRUARY

Judge Miller defended the legality of the publication proceedings conducted in connection with the passage of the franchise. He said that every step in the franchise election negotiations had been carried out in a legal manner. Judge Miller maintained that the grant was not complete until the franchise had been finally accepted by the company and that previous to this action the publication had been complete. He argued that the Supreme Court should not anticipate any alleged unconstitutional provisions in the franchise, but should permit the contract to be completed and allow the constitutionality of the provisions to be determined afterward.

It is thought that the Supreme Court will render its decision in the case during February.

Almost coincident with the hearing in the Supreme Court Judge James C. Hume in the District Court decided that the Des Moines City Council could not deny the Valley Junction-Des Moines buses the right to use the streets of Des Moines. The City Council had ruled the inter-city buses from the streets, but the proprietors of the bus line sought an injunction in Judge Hume's court. Judge Hume based his opinion on the fact that the Valley Junction buses were quartered at Valley Junction, outside of the city limits of Des Moines, and that the City Council had no right to restrict inter-city business.

Following Judge Hume's decision members of the Des Moines Bus Men's Association started overhauling their equipment and claimed that they would attempt within the next few days to place buses in operation on at least four lines. Ever since the City Council ruled the buses from the streets upon resumption of specified service by the Des Moines City Railway the only buses which have been operated in the city have been between Des Moines and Valley Junction, a suburb about 5 miles distant.

The Des Moines City Railway has been overhauling and repainting its rolling stock and announced on Jan. 14 that within the next ten days fifteen more cars will be placed in service, bringing the gross number up to 131 cars. Service has been improved constantly during the last month and there appears to be a general spirit of satisfaction among car riders over the facilities afforded.

Hudson Valley Puts Into Effect Third Wage Cut

The Hudson Valley Railway, Albany, N. Y., has announced a decrease in the wages of its employees amounting to 5 cents an hour, effective Jan. 1. The wages are now 45 cents an hour. This makes the third cut within four months.

On Sept. 30 the platform men of the Hudson Valley Railway were informed that, effective Oct. 1, the wages of all employees would be decreased 5 cents an hour, the reduced rate to be in effect to Nov. 1, on which date a further decrease of 5 cents an hour would go into effect and these rates were to be guaranteed by the company until Jan. 1, 1922.

The financial condition of the company is reflected in that statement, part of which is reproduced below:

> Since the railroad was built twenty years ago, it has annually operated at a loss. It has been operated by its present owners for fourteen years, during which time it has lost $1,400,000, of which amount $261,408 was incurred during the eight months of this year ended Aug. 31. This great loss, which averages more than $300 a day for the fourteen years, was incurred for the simple economic reason that the company's revenues had not kept pace with its expenses, despite three increases in fare—from 5 cents to 6 cents, from 6 cents to 7 cents and from 7 cents to 8 cents. Very little, if any, relief came from the increased fares, as the delay in granting them was so great that in the interim the company was burdened with additional expenses which the increased fares could not possibly wipe out. The first fare increase was not granted until a year and five months after it had been requested, the second more than eight months after and the third nearly a year after, although the wages were increased in each case at the time of application.
>
> It is interesting to note the steady increases in rates paid under the present owners of the property:

Year	Cents
Aug. 1, 1908	22
July 1, 1909	25
July 1, 1910	26
July 1, 1912	27
July 1, 1914	28
July 1, 1916	*28-29-30
July 1, 1916	†29-30-31
Jan. 1, 1916	*29-30-31
July 1, 1918	40
July 1, 1919	45
July 1, 1920	60

*Glens Falls & Saratoga Division.
†Waterford Division.

In announcing its present cut the company states that it is not taking in enough money to pay operating expenses and taxes and that this further reduction is necessary in order to pay the wages of employees and also the taxes due the various municipalities through which this company operates.

Jitney Cases Before Court

Otis M. Thatcher, Charles J. Duff, William Houghtaling and Dewitt J. Clapper, Albany, and Theodore J. Gackstatter and Christos Dominos, Watervliet, were adjudged guilty of criminal contempt of court and fined $100 each and in default of the payment of the fine to serve thirty days in jail by Justice Charles E. Nichols on Jan. 14 at the special term at Albany, N. Y. The men were charged with violating the injunction order granted by Justice Harold J. Hinman last August prohibiting any person from operating jitneys in competition with the United Traction Company.

Justice Nichols also heard arguments and reserved decision in the application of the Troy & New England Railway for a temporary injunction restraining the K. L. W. M., Inc., from operating a bus line from Troy to Averill Park through the town of Sand Lake. Mr. MacLean and Mr. Carter, representing the company, said that the town board of Sand Lake, comprising the supervisor, town clerk and the four justices of the peace, had adopted a resolution on Dec. 28, under authority of an amendment to the transportation law, passed by the Legislature of 1919 making the provisions of the transportation law applicable to a town whenever a resolution to do so is adopted by the town board. Such a resolution would require the operator of a bus line to obtain from the Public Service Commission a certificate of convenience and necessity.

Clark Cipperly, appearing for the bus line, which has been in operation since the strike began a year ago on the lines of the United Traction Company, and was recently incorporated with a capital of $6,000, declared the action of the town board on which the application for an injunction was based to be illegal because the superintendent of highways of the town of Sand Lake had met with the town board when the resolution was adopted and illegally voted on it. He produced the minutes of the board showing that four votes were cast in favor of the resolution and three against, which were cast by ballot, and there was nothing to show that a majority of the legal members of the board were recorded as being in favor of it.

He also contended the company had no standing in court as it had failed to follow the requirements of the law in obtaining consents of property owners through which the line runs for its operation and that it has never had such consent.

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Ouster Delayed

Mayor Couzens of Detroit to Await Action at Annual Meeting of Detroit United in February

Developments at the conference on Jan. 12 of officers of the Detroit United Railway and officials of the city of Detroit came as a surprise to Detroiters, and as a result of the personal appeal made by A. Avila Gingras as representative of Montreal stockholders of the railway, the enforcement of the ouster ordinance on Fort Street and Woodward Avenue will be held up until after the annual meeting of stockholders on Feb. 7.

Mayor Rejects Company's Offer

Although the Mayor rejected the price mentioned by the company representatives at which it would sell its entire system to the city, the break between the city and the company was averted by the appearance of the Montreal representative, who stated that the stockholders in whose interest he came were not informed of the situation in which the company was placed. The Mayor's action in deferring enforcement of the ouster ordinance until after the stockholders' meeting on Feb. 7 resulted in car service being continued on Fort Street and Woodward Avenue.

Mr. Gingras stated that he controlled enough votes to change the directorate of the company. He further explained that while the interests he represented were heavy stockholders, they had kept hands off because they were not residents of Detroit. However, it was now considered necessary by them to take part in the company's affairs at this time because the property was apparently endangered.

While Mr. Gingras declined to state who the candidate for president would be, he indicated that Charles Lauendeau of the present board would probably represent the Montreal interests. Mr. Lauendeau, he stated, was active a few years ago in straightening out the difficulties of the Montreal Tramways, now operating under service-at-cost.

City Willing to Pay Only $20,000,000

Although Mayor Couzens expressed willingness to let the Montreal broker sit in at the conference on Jan. 12, Allan F. Edwards, vice-president of the company, informed him that inasmuch as he is not a member of the directors' committee, nor on the board, it would not be proper for him to take part in the conference. After the conference members of the Street Railway Commission stated that only the unexpected developments just related had resulted in the postponing of the enforcement of the ouster ordinance, since the company's offer was considered too high. The conference was made up of the same representatives for the city and company as were present at the preceding conference.

The company's price at which it offered to sell its entire city system was announced on Jan. 12 as $24,500,000. This price was set on all remaining lines and does not include the day-to-day agreement lines recently taken over by the city at approximately $2,300,000. This additional item would make the price to the city about $26,800,000 for the lines that it offered in 1919 for $31,500,000. While Mayor Couzens was willing to pay the amount named in 1919, he is not in favor of paying more than $20,000,000 at the present time for the remaining lines. The city officials have not completed their estimate and the exact price they would be willing to pay has not been agreed upon. The Mayor stated that there was some uncertainty as to the city wanting to take over all the lines in view of changes that transportation is undergoing at the present time. He believes that considerable rerouting is necessary to improve the system.

Joint operation was started on Fort Street on Monday morning when the city started running cars alternatively with the Detroit United Railway. The Fort Street line is the fourth one to go under joint operation. The municipal railway officials plan to use Woodward Avenue type cars and Peter Witt cars on Fort Street, and Detroit United Railway employees formerly operating company cars have been taken into the employ of the municipal system. Some further details remain to be worked out and there is a possibility of the one-man safety type cars being operated by both the company and the city on one section of the line.

P. R. T. Offers to Bear "L" Operating Costs for First Year

President Mitten of the Philadelphia (Pa.) Rapid Transit Company, in a statement issued on Dec. 31, 1921, amended the recent offer made to City Councils and offered to bear the loss in operating the Frankford Elevated line for the first year, to pay to the city for the second year 1 per cent on the cost of the line, for the third year 2 per cent, for the fourth year 3 per cent, for the fifth year 4 per cent, and for the sixth year and after 5 per cent, should the agreement continue for that length of time. The Market Street line did not earn a 5 per cent return until the seventh year that it had been in operation.

The amendment also provides that the city deliver 100 cars to the Frankford elevated line and the Bustleton surface line, fully equipped and ready for operation.

The original proposal, to which these amendments are added, offers, as reported in the ELECTRIC RAILWAY JOURNAL for Dec. 24, 1921, free transfers between the Frankford elevated and all connecting cross-town surface lines north of Arch Street. Free transfers will be continued between the Market Street elevated and connecting surface lines. The fare on the line between Bridge Street, Frankford, and Sixty-ninth, West Philadelphia, will be 7 cents cash or four tickets for 25 cents. Free transfers will be given between Bustleton line and the Frankford elevated, but an additional 7-cent cash fare or four tickets for 25 cents will be charged between Cottman Street and the present terminus at Bustleton.

The amendments are based upon the continuation of the present fare, but the unamended proposals, providing for a payment to the city of 5 per cent, were built on the basis of a straight 7-cent cash fare.

The Public Service Commission has approved the clause in the proposal providing that the same rate of fare shall be charged on the Frankford line as on the other transit lines, and the clause which states that the city may terminate the lease, after the first five years, upon six months' notice.

This action by the commission removes all uncertainty as to the acceptability of the lease with those provisions. Only the rental question remains to be settled between the city and transit company officials.

In a review of the transit tangle directed to city officials and the public generally, Mr. Mitten as evidence of the good faith of the company cites that the surplus for 1921, which amounts to $1,800,000, or 6 per cent on the paid-in capital, has been used for improvements and not for the payment of dividends.

News Notes

Company Exempt from Repaving Charges. — The Community Traction Company, Toledo, Ohio, has been held exempt from all charges for repaving of streets along which the tracks are laid. Formerly the company was compelled to pave nearly half the width of the streets.

Courtesy Resolution Approved. — Numerous telephone calls and letters are coming into the office of President James P. Barnes of the Louisville (Ky.) Railway and officers are receiving congratulations from many acquaintances, in connection with the Courtesy Resolution of the company, expressed on Jan. 1, as a New Year's resolution of the company, to be followed by all employees in their relation to one another and the public.

New Wage Scale in Effect.—A 20 per cent reduction in wages was the award of the arbitration committee which was appointed several weeks ago to settle a wage dispute between the Cincinnati Traction Company and the International Brotherhood of Electrical Workers. Under the new contract line foremen are reduced from 97½ to 78 cents an hour; assistant line foremen from 92 to 74 cents an hour and linemen from 87 to 70 cents an hour. The new scale of wages retroactive to Jan. 1.

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Financial and Corporate

Municipal Railway Has a Better Year Than Last

Financial Operations of San Francisco Line Show a 20 per Cent Gain Over Previous Year

The finance committee of the Board of Supervisors of the city of San Francisco, Cal., has just issued a financial report of operations of the Municipal Railway. This report covers operations for the year ended June 30, 1921, and also gives in detail a comparative table of operations by years since the railway started operation.

The balance sheet now sets the value of plant at $7,016,984. In addition there are current assets that total $2,197,014 and deferred accounts receivable for advances incident to the building of the Stockton Street Tunnel of $48,971. These together give the total assets of the railway as $9,262,969, a gain of $340,133 over the previous year.

The liabilities, reserves and surplus set up against these assets show that $2,469,764 has been put into the property from income. The details of the liabilities follow:

Funded debt	$4,586,200
Current liabilities—(accounts payable and interest on funded debt)	294,258
Depreciation reserve	1,510,617
Compensation reserve	69,577
Contributed surplus (from general taxes and premium on bonds)	332,553
From income:	
Bonds retired	894,000
Reserve for bond redemptions	100,200
Advance account of Twin Peaks Tunnel	82,153
Advance account of Stockton Street Tunnel	48,971
Charter reserves	18,033
Additions and betterments	1,303,845
Operating surplus per year	21,762
Total surplus from income	$2,469,764
Total liabilities, reserves and surplus	$9,262,969

Operations for the year indicate that traffic has had a normal increase and which, due to no change in fares, has been reflected accordingly in the passenger revenue. Of the expenses of operation power and maintenance of equipment are the only items that show much if any increase during the year.

The accompanying income statement has been built up to correspond with the I. C. C. classification of accounts. This therefore includes comparison charges, such as taxes, etc. A study will show that the net income for the year was 20 per cent more than a year ago, and if the comparison charges are eliminated there will be a profit from operation of $56,369, as against $4,933 the previous year.

The report also has a table showing the cumulative income as of June 30, 1921, or since operation was started on Dec. 28, 1912. During this period the road earned $16,434,695. The cost of operation was $10,724,718. Interest on funded debt amounted to $1,757,928 and the reserve set up for depreciation and accidents amount to $2,944,507. All told the excess of income over operating expenses, interest, depreciation and accident reserves amounted to $1,173,924. If comparison charges are deducted to bring the figures in accord with private operation the loss for the eight years operation would be $266,244.

Threat Made to Withdraw Service in Lorain

Electric railway service will be withdrawn from the streets of Lorain, Ohio, within the next few weeks unless the City Council regulates jitney buses, according to F. W. Coen, general manager of the Lorain Street Railway. In a statement to the Council Mr. Coen said:

> We're tired of spending thousands of dollars repairing streets for the jitneys. Place the buses under the same expense burdens as the Lorain Street Railway or we'll withdraw our service.

According to Mr. Coen, the company has spent nearly $500,000 in repairs and taxes. Passage by the City Council of an ordinance regulating the buses is the only move which will serve to maintain railway service.

Withdrawal of service by the Lorain Street Railway will throw seventy-five men out of employment and force twenty-seven cars to remain idle. The Lorain Street Railway is controlled by the Lake Shore Electric Railway.

While the Cleveland, Columbus & Southwestern Railroad provides Lorain with service to Lorain and Amherst, withdrawal of service by the Lorain Street Railway would place the burden of transportation almost entirely upon buses.

Laxity by the city solons in solving the problem is believed to have been responsible for Mr. Coen's ultimatum.

Good Record Shown for Month of December

The Public Service Railway, Newark, N. J., carried 10 per cent more passengers in December than in November, according to its report filed in the federal court at Trenton. The report does not give the number of passengers using school fares, nor the number of non-revenue passengers. The report shows nearly 3,000,000 more passengers were carried last month than in November. The total number of persons paying the 8-cent fare increased by 749,731, while the total number of those using tokens at four for 30 cents increased about 100,000.

STATISTICAL INFORMATION—MUNICIPAL RAILWAY OF SAN FRANCISCO

Year ended June 30	1921	1920	Per Cent Change
Track owned and operated (miles)	57.97	57.97	.....
Track owned and operated jointly with United Railroads (miles)	5.15	5.15	.....
Carhouse tracks and sidings and unused spurs (miles)	4.00	4.00	.....
Total mileage	67.12	67.12	.....
Average total miles of single track operated at end of year	63.12	63.12	.....
Revenue car miles	(a)	7,182,475	.....
Revenue bus miles	(a)	236,797	.....
Total revenue miles	$7,538,737	$7,419,272	1.4
Revenue car hours	(a)	(a)	.....
Revenue bus hours	(a)	(a)	.....
Total revenue hours	$806,761	$795,578	1.1
Revenue passengers carried on cars and buses:			
Five cent cash	56,910,535	53,645,764	6.20
Five cent government ticket	62,034	66,904	*7.28*
Two and one-half cent school ticket	745,902	639,894	11.68
Two cent revenue transfers	371,326	600,296	*38.20*
Total revenue passengers	58,089,797	54,952,858	5.50
Free transfer passengers	11,361,120	10,757,504	5.50
Free passengers, employes, police, firemen, etc.	509,917	458.884	11.12
Total car and bus riders	69,960,834	66,169,246	5.80

Note—Italics indicate decrease.
(a)—Information not given in report.

INCOME STATEMENT—MUNICIPAL RAILWAY OF SAN FRANCISCO

Year ended June 30	1921	1920	Per Cent Change
Revenues:			
From transportation	$2,868,616	$2,702,289	6.2
From other railway operations	10,468	10,147	3.0
Total railway operating revenue	$2,879,084	$2,712,436	6.2
Operating expenses:			
Ways and structures	100,228	102,130	*1.86*
Equipment	201,109	186,947	7.5
Power	401,862	348,383	15.2
Conducting transportation	1,315,475	1,293,309	1.7
Traffic	995	666	49.2
General and miscellaneous	89,122	94,432	*5.62*
Loss on road retired	8,185	.....	.....
General and misc. (comparison charges)	4,974	*4,912	1.26
Depreciation (14 percent passenger revenue)	401,669	378,429	6.4
Accident-reserve (4% of passenger revenue)	114,745	108,122	5.9
Total operating expenses	$2,638,364	$2,517,330	4.8
Net operating revenue	240,720	195,106	23.4
Taxes (comparison charges required by charter):			
State franchise (5.25 per cent operating revenue)	151,153	142,488	5.9
Municipal franchise (3 per cent operating revenue)	86,069	81,092	6.2
Municipal car license ($15 per car)	2,985	2,955	1.02
Total taxes	$240,207	$236,535	1.6
Operating income	513	*31,429*	101.6
Non-operating income	35,129	27,405	28.0
Gross income	$35,642	*$4,024*	1,018.0
Deduct for bond interest	224,453	233,773	*3.99*
Net income transferred to profit and loss	*188,811*	*237,797*	20.62
Surplus at beginning of year	*137,686*	100,111	237.00
Surplus at close of year	*326,497*	*137,686*	137.00

Note—Italics indicate loss or decrease.
* Nothing allowed for legal and office expense.

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Wants Lien Against Toledo Property

Claimants on judgments and for interest coupons on bonds went into federal court recently and asked leave to file an intervening petition against the Toledo & Western Railroad, Toledo, Ohio, to make their claims a lien against the property. The court took the matter under advisement.

The receivers of the road, J. Frank Johnson and Harry A. Dunn, are also planning to bring into court all persons who made stock subscriptions to the Toledo & Western and seek to collect any unpaid portions. Several of those stockholders live in Cleveland, the court was informed.

Possibility of Solving Financial Problem Seen

Satisfactory adjustment of the differences between the city and the Jacksonville (Fla.) Traction Company, in receivership, over the payment of the company's share of paving Main Street, about $100,000, is believed to be near, according to City Attorney Pat H. Odom. He refused to give any indication as to the solution found, following the electric company's recent demand, voiced by Peter O. Knight, general counsel for Stone & Webster (who own the local company) in the southeast, that a higher fare be granted.

The Railroad Commission granted a 7-cent fare two years ago, but Mr. Knight told the City Council recently that this was not sufficient. He asked that a committee of the Council be named to confer with him on the possibility of relieving the situation.

Whether this committee is prepared to recommend an 8-cent fare so the company can pay the $100,000, or whether some other arrangement has been made such as the issuance of receivers' certificates upon order of the federal judge, is causing speculation.

Meanwhile the paving project on Main Street—or rather two of them, Orange to Phelps and Phelps to Eighth—is being held up.

Twenty-Three Electric Railways Valued at $16,742,658

A total of $7,668,525 is due in taxes for 1921 from public service corporations in West Virginia, according to figures compiled in the office of State Auditor Bond. In addition to the taxes these corporations are required to pay a total of $80,000 for the support of the Public Service Commission. The total assessed valuation of all property in West Virginia owned by these corporations was $368,183,269. The recapitulation shows twenty-three electric railways valued at $16,742,658 on which the tax is $396,157 and the fee $3,863.

The figures for the larger companies are as follows: Charleston Interurban Railroad, tax, $44,679, fee, $347; Wheeling Traction Company, tax, $33,795, fee, $363; Ohio Valley Electric Railway, Huntington, tax, $29,144, fee, $220; Monongahela Valley Traction Company, tax, $163,390, fee, $1,540; Kanawha Traction & Electric Company, tax, $19,080, fee, $220.

3,578,855 Fewer Fares in 1921

Salt Lake Company Must Cut Service or Increase Fares—Bond Interest Not Earned

During the past year the business of the Utah Light & Traction Company, Salt Lake City, Utah, has fallen off as a result of the industrial depression and unemployment. The net decrease in the number of revenue passengers carried in 1921 as compared with 1920 was 3,578,855 fares. At an average rate of 6½ cents per paid passenger, the loss in gross earnings was $232,625 for the year.

As a result of this the company did not earn all of its bond interest, nor could it set up any part of the annual depreciation reserve fund prescribed by the Public Utilities Commission, which requires the company to set up each year a certain reserve to cover depreciation, plus 5 per cent interest on the amount already accrued in the fund. If for any reason the company is unable to pay this in a particular year, it must be made up the next year and the regular amount for that year, plus the 5 per cent interest, must be paid also.

The amount for 1921, which the company could not meet, is $144,725 plus the 5 per cent interest on previous accruals, or $151,961. This sum must be made up in 1922 and in addition future accruals must be earned.

In consequence of this showing the company has been casting about for means of retrenchment. The basic wage scales of the employees were fixed on May 1, 1921, for a period of one year by a board of arbitration, and therefore cannot be disturbed at present. It was finally decided that about the only reduction in expenses that can be effected at this time is to reduce car service. To this end a careful check of the traffic on each line has been made, and it was found that riding on many lines has fallen off to a point where a reduction in car service should be made. Car service on the Depot Loop was reduced on Dec. 18. Next it was found that a saving of about $12,000 a year could be made by changing the downtown loop of the Sixth and Ninth Avenue lines. This change and proposed economy has been opposed, and the question is now before the Public Utilities Commission.

Regardless of the outcome of this case the company is convinced that substantial reductions must be effected if it is to continue to operate on the present rates of fare. The officials of the company believe that they have correctly sensed the wish of the great majority of the people of the city in endeavoring to reduce expenses rather than increase rates. In this connection they say:

> It must be one or the other, and we ask you to bear this in mind if the company proposes to reduce service on your line. Such reduction will not be below that of the average for the system as a whole.

Financial News Notes

Interborough Postpones Meeting.—Interborough Rapid Transit Company postponed its annual meeting from Jan. 16 to Feb. 15.

December Net Income Is $126,590.—December reports of the Market Street Railway, San Francisco, Cal., show operating revenues to be $815,276, operating expenses and taxes $628,332, operating income $186,944, nonoperating income $3,717, gross income $190,661 and net income $126,590.

Temporary Suspension Authorized.—The California Railroad Commission has authorized the San Francisco-Oakland Terminal Railways to suspend operation on part of its system at El Cerrito, Contra Costa County. The limit of time is ten years. The company has not been operating the line for five years under a previous order of suspension.

Directors Elected.—The annual election of officers for the New Orleans Railway & Light Company, New Orleans, La., will be held on Feb. 6, 1922. At the recent annual meeting of the board of directors of the company, A. L. Kempster, general manager, was elected to the board of directors, to succeed J. S. Bleecker, now engaged in other business. D. D. Curran, J. W. O'Keefe, Frank B. Hayne, Lynn H. Dinkins, J. H. DeGrange and R. W. Wilmot were re-elected to the board.

Losses Shown Under Five-Cent Fare.—According to a report submitted to the Public Utilities Commission of Connecticut by President L. S. Storrs of the Connecticut Company, the operating results of the Bridgeport division of the Connecticut Company for the week ended Jan. 7 as compared with the same days of last week of the flat 10-cent fare, shows a loss of $2,595. A similar comparison for the Norwalk division shows a loss of $100 under the 5-cent fare. The loss for the week ended Dec. 31, for the Bridgeport division was $3,140 and for the Norwalk division, $355.

Wants Receiver Appointed.—A court order has been issued against the Fairburn & Atlanta Railway & Electric Company, operating in Atlanta suburbs, directing the company to show cause why a receiver should not be appointed for the line. An injunction is also asked against the company, the petition being filed by J. L. Brassell, trustee for the holders of bonds against the company in the sum of $42,000, which matured Jan. 1, 1922, and which the company was unable to pay. The injunction is asked on the grounds that the defective condition of the roadbed makes it dangerous to operate the cars.

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Traffic and Transportation

Buses Barred from Downtown Districts

Toledo Regulates Buses While Street Railway Commissioner Plans Increased Service

An order barring all buses from operation in the downtown district at Toledo, Ohio, went into effect at midnight on Saturday, Jan. 14. This was the first real regulation under the ordinance passed by Council some months ago and which gives to the director of safety the duty of assigning routes and schedules to buses. Before that time all bus operators must file with the finance director their new routes and pay their 1922 license fees.

After several conferences, at which Mayor Bernard F. Brough, Finance Director Walter Stewart, Law Director Frank Dotson, Street Railway Commissioner Wilfred E. Cann and Safety Director Gilson D. Light of the new administration were present, this plan of regulating the buses and preventing downtown congestion was worked out.

The district from which buses will be barred is bounded by Cherry Street on the north, Erie Street on the west, Washington Street on the south and the Maumee River on the east. The territory is six squares wide by eight squares long and contains most of the downtown business houses.

INTERURBAN BUSES ALLOWED IN LOOP

Interurban buses will be allowed to loop into the district to call at their new interurban bus station which is near the electric interurban station.

The city officials believe that this new order will enable them to check up on the operations of the buses more accurately and prevent the ruthless competition which has marked the operations here for several months.

Although theoretically regulated, the buses invariably operated so as to beat electric railway cars by a block or less and pick up passengers at crowded downtown corners in peak load periods of the day, and a large percentage of them went off the streets during the hours when few passengers were carried.

However, it is estimated by the city officials that the 93 buses operating last week were carrying an average of 20,000 passengers daily. This diverts much revenue away from the electric railway company. It is the plan of the street railway commissioner to purchase a few extra cars, placing probably about $10,000 a month toward this account, and affording the car riders improved service on most all lines. Schedules will be revised immediately after the new regulation goes into effect.

The excess of revenue above the cost of the cars will go into the fare stabilizing fund and on the present basis will work toward a fare reduction in the course of a few months.

Mayor Brough stands firmly for the regulation of buses because he explains that ten citizens ride electric railway cars to every one using bus service. He believes that the regulation of competition will favor the car riders.

Some of the buses may be forced by the new order into auxiliary service. This would be favored by the street railway commissioner and would probably form a good indication of future routes for extensions.

Police have been instructed to enforce the bus regulation order as violations of a city ordinance which makes the maximum penalty $500 fine.

The Toledo Bus Owners' Association officials asked the Mayor to modify the order to permit them one trip through the business district on each round trip of their route, but the Mayor did not yield. They have threatened to test the order in the courts through injunction proceedings. The city legal department will fight the battle for the city. The ordinance has already been held to be constitutional by the Supreme Court of Ohio.

Committee Appointed to Survey Freight Transportation

The Connecticut Chamber of Commerce, at a meeting held in New Haven, Conn., recently, appointed a committee to make a survey of the freight transportation situation in Connecticut and to suggest proper adjustment between the railroads and motor trucking transportations companies. The personnel of the committee named is as follows:

Le Grand Cannon, of the Austin, Nichols Company, New Haven, representing the merchants; John T. Chidsey, president of the C. J. Root Company, Bristol; and Paul K. Rogers, secretary-treasurer of the Skinner Chuck Company, of New Britain, representing the manufacturers; Arthur M. Collens, manager of the investment bureau of the Phoenix Mutual Life Insurance Company, Hartford, representing financial interests; E. J. Pierson, president of the New York, New Haven and Hartford Railroad, representing the railroads; Lucius S. Storrs, president of the Connecticut Company, representing the "Ship-by-Trolley" movement; H. H. Skerritt, Jr., manager of the Hartford branch of the Packard Motor Sales Company, representing the automotive interests; Samuel Russel, Jr., Middletown, representing agriculture; Robert Scoville, Lakeville, formerly Connecticut Food Administrator during the war; and Alfred H. Terry, former city engineer of Bridgeport.

Railway Ordinance Passed

City Council of Cincinnati Adopts Plan Insuring Continuation of Seven-and-a-Half-Cent Fare

By a vote of twenty-seven to three the new electric railway ordinance has been adopted by the City Council of Cincinnati, Ohio. It insures a continuance of the present 7½-cent fare, through deferring payment of the franchise tax of $350,000 for one year from the Cincinnati (Ohio) Traction Company.

The ordinance is not to become effective for thirty days. The traction company has thirty days after the date of its passage to reject or accept its terms. The ordinance in substance is the same as the ordinance passed by Council six months ago, except that the six-month period during which the franchise tax was not to be considered to be a factor in rate making is extended to one year.

Furthermore Saul Zielonka, City Solicitor, said that the new ordinance provided that if the company for any reason increased the fare beyond the present limit of 7½ cents, then the so-called deferment clause would cease to be operative from the time that such increase is made until the fare again is reduced to 7½ cents, and during the period the increased fare is demanded the franchise tax for that period would be considered to be a rate-making factor and to be payable to the city.

A resolution also was adopted authorizing Mayor George P. Carrol to appoint a citizens' committee which is to confer with city officials and officials of the traction company relative to a readjustment of the traction properties.

Councilman Edwin Kellogg bitterly opposed the passage of the ordinance and fought for the indefinite postponement of the proposal. He recently introduced a resolution seeking the forfeiture of the franchise of the Cincinnati Traction Company on the grounds that the company had not fulfilled its obligations to the city in that it is back in the payment of the franchise tax.

Davenport Fare Increase Hearing Set

Hearing in the case of the Tri-City Railway of Iowa, Davenport, has been set for Jan. 24. At that time the motion will be heard of the City Commission that the injunction, permitting the transit company to charge an 8-cent fare, be set aside. The injunction was asked for by a number of merchants of Davenport, and prevents the city from interfering in the fare increase. The merchants claimed the former 5-cent fare would impair transportation.

The plan of a 5-cent fare for purchasers of a 50-cent ticket book once a month will soon be presented to the City Council. This plan will go into effect on the Illinois side of the river on March 1, under a ruling of the Illinois Commerce Commission.

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Fares Cut in Connecticut

Three Tokens to Be Sold for a Quarter —Cash Fare Remains at Ten Cents —Cities Still Restive

A reduction of 16 per cent in fares will be made effective on March 1 on all lines of the Connecticut Company through the sale of three tokens for 25 cents. A token or 10 cents will be accepted in paying for one fare within any of the present flat fare areas, with all transfer privileges as at present. These tokens will be sold by all conductors at three for a quarter, or may be purchased at the company offices and agencies at twelve for $1.

This method of reduction recognizes the difference between the casual rider, who will pay 10 cents, and the regular patron who will, of course, use the reduced rate token. It also continues the single fare for one trip within an entire city area.

Due to the present industrial depression the revenues of the company are less than last year at this time, but by reason of an 8 per cent reduction in rates of wage and decreases in the cost of coal and other materials, the expenses are slightly less than last year, although still more than twice as much as in pre-war years.

INCREASE IN PATRONAGE ESSENTIAL

The hope is expressed by the company that reductions from the present rate of fare will induce an increased use of the cars and thus offset, to a certain extent, the reduction in revenue accompanying a lower rate of fare.

The decision to reduce fares was reached at a meeting of the directors of the company held on January 7. This had been anticipated in a statement made in November, that if conditions during the winter were favorable, such action would be taken.

It was in November, 1917, that the Connecticut Company made the first increase in the fare, from 5 to 6 cents, and at 6 cents it remained until October, 1919, when a zone system was installed with 6 cents as base fares and short zones at 2 cents. This system was followed by a further modification of the zone plan and was in turn followed by the so-called 7-cent 6-cent plan, which in November, 1920, was replaced with the 10-cent straight fare.

Last summer a movement for lower fares brought about the establishment by the Public Utilities Commission, for a probationary period of ninety days, of a 5-cent fare on city lines in Norwalk and Bridgeport. In Norwalk the rate went into effect Nov. 9 and in Bridgeport Nov. 20. The period will expire on Feb. 9 and 20, respectively. Soon after the experiment began, Waterbury, New Haven and Hartford indicated to the commission that they would like 5-cent fares within their urban limits. The commission intimated that it would await the termination of the probationary periods before making any decision.

The fare reduction announced will apply to Bridgeport, Conn., where a 5-cent fare has been in vogue for a trial test of ninety days. In response to an inquiry Mr. Storrs said:

> The fare reduction of the Connecticut Company is planned to cover the entire State, including Bridgeport. Until Feb. 20 the Bridgeport trolley fares matter is in the hands of the Connecticut Public Utilities Commission under a ninety-day 5 cent fare test. What they will do after that date, I do not know.

Despite the fact that the Connecticut Company has announced a voluntary fare reduction in all lines controlled, municipal authorities at Hartford, Conn., are seeking a further fare reduction. The Common Council of the city will hear a report from a special committee on Jan. 23. This will ask that a petition be filed with the public Utilities Commission asking for still lower rates than those already announced.

Railway Planning to Oppose Bus Application

It is considered probable that the Poughkeepsie City & Wappingers Falls Railway Poughkeepsie, N. Y., will fight the application of the B. & B. Bus Company for a franchise permitting it to pick up and discharge passengers in the village of Wappingers Falls, except where the line parallels that of the trolley company, when it comes before the Public Service Commission for ratification.

The board of village trustees of Wappingers Falls has voted unanimously in favor of granting the franchise to the bus company.

Charles A. Brooks, in charge of the Poughkeepsie office of the Poughkeepsie & Wappingers Falls Railway, states that he does not know just what action his company will make until official notification of the action of the Wappingers board is received at the office.

The action of the village board was taken when the application for a franchise was presented by Messrs. Bunnell & Blakeley, proprietors of the bus line, running from Poughkeepsie to Beacon. The bus company was represented by Attorney Herman N. Harcourt.

It is the contention of the electric railway that the bus line, if given the desired franchise, could stop at the east side of the bridge and pick up and discharge passengers and packages.

In its application the bus company agreed not to pick up or discharge passengers on the west side of the village, where its line runs parallel to that of the trolley company.

The electric railway contends that it serves the whole village of Wappingers Falls, and not merely residents on the west side of the bridge.

Carries 27,400 to Rose Tournament

The Pacific Electric Railway, Los Angeles, Cal., carried 27,400 persons to the Tournament of Roses at Pasadena on Jan. 2. The total last year was 43,000. Rainy forecasts cut down this year's crowd, the company stated.

Rule of Road Changed

Cars in Vancouver Now Run on Right-Hand Side — Change Costs Railway $1,000,000

That part of British Columbia containing the cities of Vancouver, Victoria and New Westminster at 6 a.m. on Jan. 1, successfully changed its rule of the road from "Keep to the Left" to the rule prevailing over the rest of the North American continent. The problem was mainly one for the British Columbia Electric Railway to solve. That company operates the city systems in all three cities as well as interurban lines in their vicinity.

LEGISLATURE ORDERED CHANGE

The change was ordered by the Legislature of British Columbia two years ago. It is expected that it will take about two years more to complete all the work in connection with the change. The total cost to the British Columbia Electric Railway will be about $1,000,000, of which the government will pay $350,000.

Work in connection with the change consisted mainly of remodeling the cars, changing switches and cross-overs and of overhead work. Work on the cars has been going on for six months. This consisted of fitting steps to the right-hand side and temporarily boarding these up. By standardizing, as many as nine cars were turned out in one day.

Temporary barricades on the right side were made so that they could be taken off and the whole car turned out for service in less than half an hour. With more than 200 cars to attend to, the mechanical department under G. A. Dickie, at Vancouver had every car ready for right hand service between 8 o'clock Saturday night Dec. 31 and 7 o'clock Sunday morning, Jan. 1. The material taken from the right hand side will be fitted immediately to the open left side, work that will take two or three days.

Of the fifty-six cross-overs throughout the system, some had already been changed; those which had not been changed were blocked up with rubber. Of seventeen electric switches in the mainland system twelve were made ready for service by the time the first cars ran on Jan. 1, duplicate equipment having been installed previous to the change.

CITY COVERED BY SECTIONS

In order to cover the track changes, Vancouver was divided into four districts, to each of which a crew supplied with an automobile was assigned. Victoria and New Westminster were similarly organized. Extra tower wagons were built on motor trucks and the trolley wires and frogs changed. Practically the only trouble experienced on the morning of the change was that of trolleys coming off. On one-round trip of fifteen miles, ten instances were noted. This was remedied later by observing the actual conditions.

On the double-track interurban line between Vancouver and New West-

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minster, twenty-four stations had to be changed in order to be on the near side of crossings. Practically all these were changed before Jan. 1.

Much of the work on the tracks had to be proceeded with while cars were operating, the last car reaching the carhouse at 4 o'clock on the morning of Jan. 1 while the first right-hand car left the carhouse at 5.30 o'clock the same morning.

EXTENSIVE PUBLICITY CAMPAIGN

The change threatened to be complicated by a strike of the railway employees. In November a board of conciliation whose chairman was accepted by the men heard the case for a reduction of wages sought by the company and recommended a 10 per cent reduction on Dec. 1. The men rejected the award and although the company paid the old scale of 65 cents an hour on Dec. 15 notified the men that the new scale would go into effect on Jan. 1. The men's officials recommended that they do not come to work on Jan. 1, but at a mass meeting held at midnight on Dec. 31 wiser councils prevailed and a vote will be taken later. In view of the timidity of drivers and the requests of the police to automobile owners to leave their cars at home for the first few days, it was felt that a flood of automobiles resulting from a street car strike would cause serious accidents.

The change in the rule of the road was preceded by an extensive safety and educational campaign by the company, both to avoid accidents and to prevent the slowing up of the service.

Transit Company Gives Bond

Pending hearing of an appeal to the State Supreme Court, the Sound Transit Company, Seattle, Wash., recently posted $700 bond in the Superior Court of Thurston County, in the case brought by the jitney company to revive its so-called "Roosevelt Heights" jitney line, which has been banned by the city. Judge John M. Wilson of Thurston County Court recently set aside the certificate of necessity under which the company claimed the right to operate buses into the business district in competition with the Municipal Street Railway. He then refused to sign an order directing the State Department of Public Works to issue a new certificate. The company served notice of appeal and was required to give bond.

Temporary Operation of Buses Encouraged

For the aid of the privately-owned feeder jitney buses now serving the Cowen Park and Fairview districts, Seattle, Wash., and connecting with the municipal electric railway at the Eastlake Bridge, an ordinance has been passed by the City Council allowing the drivers 7½ cents out of every 10-cent fare collected. The other 2½ cents will go to the Municipal Street Railway.

The action was taken to encourage private transfer buses to continue operations until some other settlement of the Cowen Park transportation problem can be reached. Previously the jitneys have been operating on a 50-50 basis with the railway.

In the meantime, the proposal to purchase auto buses for operation in the district by the electric railway, has been temporarily held up, pending decision as to the legality of the plan by a test case in the courts. Corporation Counsel Walter F. Meier has held that the city cannot legally operate automobile transportation lines. The proposal provides for an appropriation of $35,000 for the purchase of municipal auto buses, similar to those now operated in four other districts of the city under the railway management.

Proposed Line Is Interurban Outlet

As an outlet for its proposed interurban service between Tulsa and Claremore, Okla., the Oklahoma Union Railway Tulsa, Okla., will construct a line in Tulsa east of St. Louis Avenue on Eleventh Street. The company is tearing out its Orcutt Lake line on St. Louis Avenue and has obtained an injunction from Judge Biddison restraining the police department from interfering with the abandonment activities. City Attorney Frank E. Duncan favors a hearing on the injunction and, if the Mayor and commissioners approve, intends to ask for a modification or withdrawal of the order. If this fails and if the supreme court does not issue the writ prohibiting the tearing up of the tracks, the city may still appeal from the order of the corporation commission. The city attorney says that the commission is without jurisdiction over electric railway companies. Mr. Duncan made the following statement:

> That section of the constitution defining the duties and powers of the Corporation Commission clearly states that the commission does not have jurisdiction over transportation systems that operate wholly within the corporate limits of a city. If the city goes before Judge Biddison or before the Supreme Court in its efforts to prevent the abandonment of the Orcutt Lake line, it expects to base its contentions partly on this fact. If the corporation commission has the powers it exercises, the franchise of a public service corporation with the city of Tulsa is merely a worthless scrap of paper, and the commission would have the privilege of ordering torn up any street car line in the city.

An appeal from the commission would involve long legal procedure.

I. F. Crow, general manager of the traction company, said that the line on St. Louis Avenue does not meet the requirements for an extension to Claremore and other points, but that Eleventh Street does. He discussed the removal of the St. Louis Avenue car tracks as follows:

> It is to be regretted that a car line once constructed has to be torn out. Such a condition as that pertaining to the tracks on St. Louis avenue would never have existed except for the reason that the O. U. R. lines to the southeast and northwest parts of the city were originally built as possible outlets for interurbans. Both these lines are now paralleled by the other street railway company which has resulted in destructive competition.

$25,000,000 Bus Policy Favored

Measures providing for the establishment of a $25,000,000 bus system for New York City and the abandonment of all surface and elevated lines in favor of subways will be drawn up following a public hearing to be held by the Board of Estimate on Jan. 27. The bill empowering the city with the right to change from the present transit system to one composed exclusively of buses and subways will be presented to the present session of the Legislature at Albany. Previous attempts of the Hylan administration to get such a bill adopted have failed.

At the meeting of the Board of Estimate on Jan. 13, a resolution was adopted favoring the Hylan transit plan as a fixed policy. Commissioner Whalen, of the Department of Plant and Structures, presented an application to the Board for $25,000,000 in corporate stock for the initial expenses connected with the purchase of 3,500 buses which would be operated and maintained by the city. Total fixed charges were estimated at $13,000,000 a year. Commissioner Whalen stated that with a 5-cent fare the total daily return to the city would be $112,000. This is on the assumption that each bus will carry 700 passengers daily. The net income for the year he placed at $4,031,000. Properly to care for the transportation by bus there will be 200 routes required.

At the meeting of the board were representatives from a number of civic organizations, and all agreed that no more elevated lines were wanted.

The substitution plan adopted by the board calls for the replacement, seat for seat, of the surface lines in Manhattan, but in the other boroughs some surface lines would be kept. Trackless trolleys and some buses would be used in Richmond. The cost of installing the buses has been budgeted as follows:

Cost of 3,500 buses, at $5,500 each	$19,250,000
Garage equipment and repair work	700,000
A central garage station	1,000,000
Garage stations throughout the city	3,800,000
Contingencies	250,000
Total	$25,000,000

Testimony which has been brought out in the hearing before the Transit Commission, stated that $75,000,000 would be needed to handle by buses the transportation of New York City now cared for by trolley lines. The Hylan plan would replace 1,060 electric railway cars with 1,300 buses in Manhattan. The Transit Commission within the next week will ask Commissoner Whalen to testify concerning his recently proposed plan. The commission office said, in announcing that it would ask Mr. Whalen to testify, that to establish bus lines certificates of convenience were necessary which would have to be obtained from the Commission. In addition legislative approval for the financial end is required, and the court would have to reverse its attitude. The court now opposes operation of bus lines in competition with established trolley lines.

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Higher Fare Saves Road

To save the Millville (N. J.) Traction Company from ceasing operation the Board of Public Utility Commissioners has made an order permitting the corporation to increase its fare from 7 to 10 cents. The company operates in Millville and also a service of 7 miles to Vineland. The company served notice on the commission that unless it was granted the increase in fare it would cease operating and scrap its roadway.

Prominent residents of Vineland and Millville and residents along the line of the company appealed to the directors of the railway to postpone their action until the commission held a meeting to go over the matter. As the result of the order made by the commission the traction directors reconsidered their action to abandon operations. They claimed that the new rate of fare would barely furnish sufficient revenue for operation and would preclude dividends to stockholders.

It's Chestnut Again in Lousiville

The Chestnut Street carhouse of the Louisville (Ky.) Railway in December won the record for the low accident ratio, this being the third time that this carhouse has won since the plan of giving dinners to the low ratio houses was established. For December the carhouse operated 5,565 miles per accident, whereas 2,500 miles per accident is generally considered good.

The poorest showing of the month was made by the Seventh Street house, which showed 1,190 miles per accident. However, that line runs over a number of congested district streets, including big jobbing and retail sections, and also through sections with many small cross streets.

Jitney Regulatory Measure Introduced

All jitneys and buses are declared to be common carriers and are placed under the control and supervision of the Public Utilities Commission, the same as electric railways and railroads, in the act before the Rhode Island Legislature upon which a public hearing was held recently before the House judiciary committee.

The outstanding feature of the act is that persons, firms or corporations seeking to operate jitneys must first obtain a certificate of necessity and convenience requiring their operation. This throws the burden of proof upon the jitney operator to convince the commission in the case of proposed competition with an electric railway that the auto service is a necessity.

The measure is very far-reaching in its scope. It has the approval of the recently organized United Electric Railways, which took over the electric railways in Providence, R. I., and the metropolitan district, and has the backing of the Republican organization, which controls the Legislature.

The act, which is patterned after the Connecticut law, with modifications to meet conditions in Rhode Island, would become operative on July 3.

Transportation News Notes

Money Appropriated for Traffic Signals.—The finance committee of the Atlanta City Council on Jan. 11 appropriated $5,000 for the installation of six additional traffic towers in the downtown section of the city, to be placed within the next sixty days. The action followed recommendation for additional towers by the city electrician due to the unusual success that has been obtained by the tower recently constructed at Five Points, one of the city's most congested districts, in the control of traffic.

Conductors Sentenced for Pilfering.—By collecting cash fare receipts thrown away in the cars by passengers the London & Port Stanley Railway, London, Ont., discovered that a number of conductors were engaged in systematic pilfering. The process was to separate the two-ply tickets and to punch the auditor's portion for a shorter trip than that paid for. Two conductors who were arrested on warrants pleaded guilty to theft charges and were sentenced to indeterminate terms of three months to two years imprisonment.

Reargument on Jitney Case Refused.—The Court of Errors and Appeals of New Jersey on Jan. 13 denied the motion of the Public Service Railway for reargument of the case in which the court recently affirmed the action of Vice Chancellor Griffin in refusing to enjoin the operation of jitneys alleged to be running in competition with the railway illegally. The refusal of the Court of Chancery was based upon the ground that the railway had no standing to enforce in a court of equity its claim that jitneys were unlawfully pre-empting the streets.

One-Man Cars Will Operate.—Sixteen new one-man cars will begin operation in Dayton (Ohio) on March 1. M. Ackerman, general manager of the Cincinnati & Dayton Traction Company, made this announcement after the City Council of Dayton passed an ordinance, permitting use of these cars. Fares will be 5 cents for the first six months. If a loss is shown, the fare will be raised to 6 cents. If at the end of another six months, there is a profit there will be a reduction to 5 cents, and in the event of another loss the fare will remain at 6 cents.

Increase in Fares Sought in Reading.—The hearing of the application of Reading Transit & Light Company (Reading, Pa.) for an increase in fares in Reading has been reopened by the Pennsylvania Public Service Commission, upon application of the company. The company says the fare allowed by the commission was not sufficient to enable it to earn the rate of return allowed. The commission placed a valuation of $6,000,000 on the company's property and fixed the rate of return at 7 per cent plus an extra 3 per cent for depreciation. It ordered a reduction in fares of from 8 cents in the Reading zone, with four tickets for 30 cents and 9 cents outside the Reading zone, with four tickets for 34 cents to a 7-cent cash fare and eight tickets for 50 cents.

Reduced Party Tickets Offered.—Party tickets offering reduced fares to groups of twelve or more patrons traveling together have been placed on sale by the Monongahela Power & Railway Company, Fairmont, W. Va. The rate is 6 cents for each zone, and will amount to a saving of 15 cents on a dollar, under the price of one-way fares. The offering of this innovation is the result of a suggestion made by President George M. Alexander to the railroad department in the general plan of that executive to augment travel.

4,350 Killed at Crossings in Three Years.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, has appealed to automobilists to look carefully before crossing railway tracks, and to take no chances in crossing in front of oncoming trains, in a New Year's pamphlet issued to the public. The suggestion is made that the driver ask someone to supervise his driving, and that he will learn to be careful. During the period from 1917 to 1920 4,350 persons were killed and 12,750 were injured in automobile accidents at railway crossings, the pamphlet states.

Traffic Signals Successful.—The City Council of Houston, Tex., has tried an electric traffic signal at the corner of Main Street and Preston Avenue, and the device has been found so successful that Mayor Holcombe announces that such signals will be installed at once at all corners on Main Street. It is planned later to install similar control signals on Fannin Street and Texas Avenue, which will include all the principal streets in the business district. The signals used show red to stop, amber to warn that a change is to be made and green to indicate the street is open. The company has asked the riding public to observe various points such as cleanliness of the cars and equipment, neatness and appearance of the men, cheerfulness, ease of starting and stopping cars, promptness in maintaining schedules, clearness and accuracy in calling streets, courtesy and kindness to passengers, politeness, application to duty, etc., and asks further that letters of commendation be written the company where it is noted they are deserved by the men. On Christmas day the uniforms will be awarded the winners of this unique contest.

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Personal Mention

G. S. Wills Advanced to Manager

Has Been Assistant to Vice-President of Wheeling Traction Company for Past Year

G. S. Wills, who has been assistant to the vice-president of the Wheeling (W. Va.) Traction Company for the past year and a half, has been appointed general manager to succeed C. P. Billings. Mr. Billings will continue as general supervisor of the Wheeling company, but will spend most of his time away from the city looking after the recent acquisition of the West Penn Power Company and the development of properties in Pennsylvania.

Few men have emerged from the subordinate to the high executive positions of traction companies better

G. S. WILLS

grounded in the work than Mr. Wills. He was born in Norfolk, Va., in 1884. Mr. Wills had barely reached his majority when he secured employment under General Manager Derrick, of the Oneonta & Mohawk Valley Railway, Oneonta, N. Y. He manifested an ambition to reach the top and from the very beginning became a close student of the details of electric railway operation. He remained under Mr. Derrick from 1905 to 1906, when he secured a place as an apprentice in electrical engineering with the General Electric Company at Schenectady, N. Y.

Leaving this employment in 1907, Mr. Wills went with the Metropolitan Street Railway, New York City, as general carhouse electrician. He later attended Pratt Institute of Science and Technology in Brooklyn, N. Y., and was graduated from a two-year course in applied electricity.

Following Horace Greeley's advice, Mr. Wills then went West. He spent two and one-half years in the copper mining districts of Arizona, where he gained valuable experience in installing electrical equipment. But the street railway business won him again and he returned East and entered the transportation department of the Citizens' Traction Company at Oil City, Pa. In six months he was made superintendent of the Franklin Division. In 1916 he became connected with the West Penn interests at Pittsburgh, first with the general sales manager as light salesman, then as power salesman, and finally as assistant to the vice-president in charge of the commercial department.

Mr. Wills went to Wheeling in September, 1920, as assistant to Vice-President Billings.

C. S. Morgan Wins $500 Prize

Charles Stillman Morgan, economist in the Bureau of Valuation of the Interstate Commerce Commission, is the winner of the $500 prize in the 1921 economic essay contest conducted by Hart, Schaffner & Marx. "The Regulation and Management of Public Utilities" is the subject of the essay which won the second Class A prize.

Mr. Morgan's training and experience have centered on the study of public utility questions, and his article is based on a comprehensive survey of the situation. It is considered in many quarters as the most authoritative and inclusive study made since the commission system of state regulation has been generally accepted. Mr. Morgan dwells particularly on efficient management, comparing the possibilities under the former methods, which allowed the companies almost unrestricted freedom, and the present conditions. After an unprejudiced presentation of the advantages and disadvantages of each, the author concludes that it is proper to reward management but not capital for increased efficiency.

Mr. Morgan was at one time professor of economics and of political science at Marietta College, Ohio.

Donald F. Hine Made Associate Western Editor

Donald F. Hine, connected with the ELECTRIC RAILWAY JOURNAL in New York as editorial representative, has been transferred to Chicago as associate to Harry L. Brown, western editor of the ELECTRIC RAILWAY JOURNAL and BUS TRANSPORTATION.

Mr. Hine joined the staff of the ELECTRIC RAILWAY JOURNAL in the fall of 1920. Since then he has devoted his attention to the preparation of articles of an engineering nature.

Mr. Hine was born in Fishers Island, N. Y. After completing the regular course in electrical engineering at the Sheffield Scientific School of Yale University he spent a year at the same institution doing special engineering work in the graduate school.

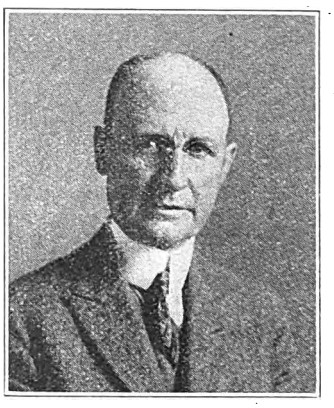
McPherson Directs East Bay Electric Division

Leaves Post as Assistant General Superintendent of Pacific Electric Railway —Was Captain of Engineers

J. C. McPherson, assistant general superintendent of the Pacific Electric Railway, Los Angeles, Cal., on Jan. 1 was appointed superintendent of the Southern Pacific Company's electric suburban lines in Oakland, Alameda and Berkeley, with headquarters at Oakland, Cal. These lines, formerly under the Western Division, are now designated as East Bay Electric Division.

Mr. McPherson's connection with electric railway interests has been extensive.

When the interurban lines serving Los Angeles and its surrounding territory were consolidated in 1911 into the present Pacific Electric lines, Mr. McPherson was appointed superintendent of the Northern Division. Two years later he was transferred to Oakland as superintendent of the Oakland, Ala-



J. C. MCPHERSON

meda and Berkeley electric lines of the Southern Pacific. He remained at this post until the United States entered the war, when he went to France as Captain of Engineers in charge of trnsportation at Basseus Docks, Bordeaux.

In 1919 he returned to the Pacific Electric Railway as assistant general superintendent, which position he has held until his recent appointment.

Mr. McPherson was born in Ireland, coming to America at the age of sixteen. For some time he was at Raton, N. M., in the machine shops of the Atchison, Topeka & Santa Fe Railway. In 1895 he became motorman on the Los Angeles & Pasadena Railway, the Pacific Electric Railway's first interurban line. This line was 10½ miles in length and operated fifteen cars, and was the beginning of the present Pacific Electric system.

In 1900 Mr. McPherson was advanced to the position of dispatcher and was later promoted to other positions, until in 1907 he became superintendent of the Los Angeles Interurban Railway, which largely comprised what was known as the Traction System, including all Los Angeles city lines. Mr.

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McPherson's steady advancement has come as recognition of his marked ability and his latest promotion will provide a more extensive field for his services.

Fred Durant, Troy, N. Y., for twenty-eight years connected with traction companies, has been appointed traffic superintendent of the Trenton & Mercer County Traction Corporation, Trenton, N. J. Mr. Durant has filled several responsible positions with the United Traction Company, operating in and about Troy and Albany, N. Y., and for several years was traffic superintendent of that concern.

Gurdon W. Wattles, for many years prominent in the electric railway field, and chairman of the board of directors of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has resigned from this position. He intends to move to California. The position of chairman has been abolished and hereafter the president of the company will preside at the board meetings.

John S. Bleecker, New Orleans, La., is now associated with the Electric Bond & Share Company of New York, N. Y., which has taken over the holdings of the American Cities Company. Mr. Bleecker was formerly general manager of the New Orleans Railway & Light Company, and subsequently was associated with the Myles Salt Company. During his three years stay in the Crescent City, he took part in many of the civic affairs of the city and State, and held membership in the Association of Commerce, the New Orleans Rotary Club and other local organizations.

Obituary

Edgar A. Brehm, manager of the Western Electric Company's telephone distributing branch at Philadelphia, Pa., was killed in the recent wreck on the Philadelphia & Reading Railroad. Mr. Brehm was graduated from Ursinus College in 1910, and became a student at the Hawthorne works of Western Electric Company. He served in the company's offices at Dallas, Cleveland and Philadelphia. During the war he was captain in the Quartermaster's Corps.

Henry F. Noyes, since 1917 vice-president of the Brooklyn City Railroad, died on Jan. 14, at his residence in Brooklyn. Aside from his interests in the electric railway field, Mr. Noyes had connections for many years with the cotton business as a commission merchant, and member of the firm of C. Bauscher & Company. He was a director of the Home Insurance Company of Brooklyn, the Brooklyn Trust Company and the Brooklyn Savings Bank.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

General Electric Investigation Ordered

Counsel of General Electric Company Request that Charges of Samuel Untermyer Be Inquired Into

Announcement was made in Washington on Tuesday that as a result of letters to the Department of Justice from counsel of the General Electric Company and also of charges made by Samuel Untermyer, counsel of the Lockwood legislative committee, the Attorney-General has ordered an investigation of the General Electric Company to ascertain if it has violated any federal laws.

The Attorney-General said that he expected that the minutes of the Lockwood committee would be available to Department of Justice investigators. If violations of federal laws are uncovered, the department will proceed against the company in the United States courts, while if any departures from state statutes are found, this information will be turned over to counsel of the New York State investigating committee.

Acting upon the Lockwood committee charges, the department will investigate the following questions involved in accusations against the company: Whether it maintains an unlawful monopoly of tungsten incandescent lamps; whether it has made unlawful contracts; whether it has manipulated its accounts and evaded the payment of excess-profits taxes, and whether it has been operating in violation of a decree handed down by federal courts in Ohio in 1911.

Experts from the Internal Revenue Bureau will be called upon to assist the Department of Justice in examining the General Electric's books and tax returns. The Attorney-General said that he would detail three members of his department to conduct the investigation.

Coal Buying Increases

Signs of the anticipated buying movement against a possible coal strike this spring are beginning to appear. Throwing off the holiday sluggishness, industries are again getting into operation, but with little increased speed. This slow improvement, coupled with a decided tendency to make overtures for future requirements, has halted the decline in bituminous production and prices.

Production was greatly improved during the first week of January. The total output was 7,460,000 tons, as compared with 5,996,000 tons the week preceding. Loadings on the first two days of last week—Jan. 9 and 10—indicate a further increase for that period.

The stock pile is being left more or less undisturbed and current needs are being largely supplied from the spot market. The removal of the transportation tax and the present extremely good values offering have about convinced buyers that prices will not be much lower, at least until a wage readjustment is made. However, the urgency of fuel requirements is not yet manifesting itself to the extent of any sharp turn for the better.

Ohio Brass Completes Malleable Iron Foundry

Operations have been started in the recently completed malleable-iron foundry of the Ohio Brass Company at Mansfield, Ohio, according to announcement of the company. The addition to the plant is on land adjoining the older Mansfield works, but has its own receiving and shipping facilities. There are three buildings in the addition, including a foundry, a powdered-coal plant and a compressor building. The foundry proper has 100,000 sq.ft. of floor space with provision for seventy-two machine molders. A feature of the plant is the use of powdered coal as fuel for the core ovens, melting furnace and annealing furnaces. For the coal-powdering operation a building 35 ft. x 70 ft. x 55 ft. has been erected, and a 4-in. pneumatic tube is used for blowing the coal to the various points where it is used in the foundry. In the first test run three tons of powdered coal were blown to the furnaces in less than five minutes. A vacuum cleaning system is to be used to keep the coal building free from coal dust and dirt.

Copper Production Resumed

The Anaconda Copper Mining Company, which with other important producers has had its mines closed since last spring, resumed operations this week. Production of copper on a large scale is not expected for several months. It is believed, however, that within thirty days output will be running at the rate of 5,000,000 lb. a month, and that this will be gradually increased.

Prospects of an early resumption by other large producers have been enhanced by the general improvement in the copper situation. The available surplus of the metal is now estimated to be less than 450,000,000 lb., a figure which, in the opinion of leaders of the industry, would presage a copper famine under normal market conditions.

Calumet and Hecla, the leading producer in the lake district, will reopen its mines April 1. Other important producers, now closed, will be operating, it is believed, within three months. Some that did not close were Kennecott, Cerro de Pasco, Wolverine, and Miami.

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One of the favorable aspects of the export situation in copper is seen in the announcement that the Copper Export Association has anticipated $10,000,000 of notes due Feb. 1, 1923, of a total issue of $40,000,000 sold to finance the sale abroad of 400,000,000 lb. of copper.

Unemployment Increased

Unemployment increased by 4.7 per cent during December according to the monthly survey of the U. S. Employment Service. The survey covers 1,428 firms located in sixty-five of the principal industrial centers of the country. These concerns were employing 1,493,107 workers on Dec. 31. The decreases in employment were mainly in industries supplying food, beverages, chemicals; stone, clay and glass products; tobacco manufactures; vehicles for transportation and railroad repair shops. Increases in employment are shown in lumber, leather, paper and printing, and all metal products.

Loan to Berne Railways

Electrification of Berne railway lines, which are owned by private transportation companies, is to be aided through a Government loan plan, according to a despatch from the American Legation at Berne, based on information published in Journal de Genève of Nov. 30, 1921.

The Department of Railroads, with the approval of the Federal Council, will submit to the Federal Chambers immediately a request for a loan of 11,000,000 francs to be used for this electrification, which is in line with similar development being undertaken.

Sale of Public Utilities in Brazil

Details of the proposed sale of the electric light, street car, and water systems of Aracaju, State of Sergipe, Brazil, have been forwarded to the Bureau by Ammerican Commercial Attaché W. L. Schurz. Bids for the purchase of these enterprises are to be received until Jan. 17, 1922.

Further information regarding this proposed sale and the manner of submitting bids can be obtained from the Electrical Equipment Division of the Bureau of Foreign and Domestic Commerce, Washington, D. C., by referring to Exhibit No. 371.

Metal, Coal and Material Prices

	Jan. 17, 1922
Metals—New York	
Copper, electrolytic, cents per lb., delivered	13.75
Copper wire base, cents per lb	15.12½
Lead, cents per lb	4.70
Zinc, cents per lb	4.72½
Tin Straits, cents per lb	32.12½
Bituminous Coal, f.o.b Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.80
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	1.80
Central, Ill., screenings, Chicago, net tons	1.83
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., cents per lb	6.50
Weatherproof wire base, N. Y., cents per lb	16.25
Cement, Chicago, net prices, without bags	1.97
Linseed oil (5-bbl. lots), N.Y., cents per gal.	75.00
White lead (100-lb. keg), N.Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	91.00

Rolling Stock

United Railways, St. Louis, Mo., through Receiver Perkins has announced that it will apply to the court for permission to purchase fifty motor cars.

Georgia Railway & Power Company, Atlanta, Ga., received during the past year from the Cincinnati Car Company fifteen double-truck PAYE motor cars, the equipment details of which are as follows:

Number of cars ordered	15
Name of road	Georgia Railway & Power Co.
Date order was placed	February, 1920
Date of delivery	May, 1921
Builder of car body	Cincinnati Car Co.
Type of car	Double truck PAYE motor
Seating capacity	48
Weight:	
Car body	16,000 lb.
Trucks	11,000 lb.
Equipment	8,200 lb.
Total	35,200 lb.
Bolster centers, length	20 ft. 6 in.
Length over all	44 ft. 6 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 1 in.
Height, rail to trolley base	11 ft 6¾ in.
Body, wood, semi-steel, or all steel	Steel
Interior trim	Natural cherry
Headlining	Nevasplit
Roof, arch or monitor	Arch
Air brakes	Westinghouse Traction Br. Co.
Armature bearings	Sleeve
Axles	J. G. Brill
Car signal system	Consolidated Car Heating Co.
Car trimmings	Cincinnati Car Co., Bronze oxydized.
Center and side bearings	Symington
Conduits and junction boxes	Flexiduct
Control	General Electric K-35-G
Couplers	None
Curtain fixtures	Curtain Supply Co.
Curtain material	Fabrikoid
Designation signs	Keystone-Vestibule
Door operating mechanism	Cincinnati Car Co.
Fare boxes	None
Fenders or wheelguards	H. B. Life guards
Gears and pinions	General Electric, Grade M.
Hand brakes	Cincinnati Car Co., Drop handle.
Heater equipment	Consolidated Thermostat Control.
Headlights	Electric Service Supply, Golden Glow SR-95.
Journal bearings	Sleeve
Journal boxes	J. G. Brill
Lightning arresters	Westinghouse MP.
Motors, type and numbers	GE, 201-I, 65 hp., 2 per car.
Motors outside or inside hung	Outside hung
Paint, varnish or enamel	Vitralite enamel
Registers	Ohmer
Sanders	Ohio brass
Sash fixtures	O. M. Edwards
Seats	Hale & Kilbourn, 400-AWO
Seating material	Wood frame, rattan panel seat.
Slack adjuster	Anderson
Springs	J. G. Brill
Step treads	Cincinnati Car Co.
Trolley catchers or retrievers	Keystone
Trolley base	Trolley Supply Company
Trolley wheels or shoes	Wheels
Trucks	J. G. Brill, 39E1
Ventilators	Railway Utility Company
Wheels (type and size)	Cast iron, 33 and 22 in.

Track and Roadway

Ohio Valley Electric Railway, Huntington, W. Va., will replace approximately 5 miles of trolley line on the Huntington division this winter.

Tampico Electric Light, Power & Traction Company, Tampico, Mex., will double track its lines on the principal streets and make important extensions into new territory.

Dallas (Tex.) Railway may soon be called on to build a double-track concrete viaduct across the Trinity River bottoms for its lines serving Oak Cliff, the portion of the city on the west side of the river. The traction company at the time the new franchise was granted built a double-track concrete structure over the tracks of the steam railway lines, but from the point where the structure crossed the steam lines, the concrete work was stopped and a wooden trestle was built to connect the lines on the viaduct with the tracks on the earth embankment through the river bottoms. The viaduct, officials of the traction company say, will cost about $250,000 or $300,000 and that the company cannot raise funds at this time to build it.

Power Houses

Paducah (Ky.) Electric Company is considering plans for furnishing Southern Illinois with electric current for the operation of its factories and providing lighting facilities.

Georgia Railway & Power Company, Atlanta, Ga., has announced that work will be resumed immediately on the Tugalo dam and power house in north Georgia. Completion of this plant will increase the company's water power 43 per cent.

Trade Notes

Fred F. Stockwell, of the Barbour-Stockwell Company, a street railway supplies house, Cambridge, Mass., was elected secretary of the New England Foundrymen's Association, at the recent annual meeting held in the Exchange Club, Boston.

Ajax Metal Company, Philadelphia, Pa., has announced the appointment of Zeno D. Barns as manager of the Cleveland office to succeed Louis E. Punell, deceased. Mr. Barns has been connected with the Westinghouse Electric & Manufacturing Company and the Westinghouse Air Brake Company.

New Advertising Literature

Gould Manufacturing Company, Seneca Falls, N. Y., has issued Bulletin No. 123, describing and illustrating steam turbine-driven centrifugal pumps.

Delta-Star Electric Company, Chicago, Ill., is distributing bulletin 37, describing high-tension outdoor substations. This bulletin contains sixty-four pages and is complete with illustrations of substations for interurban railways and other work.

The Wagner Electric Manufacturing Company, St. Louis, Mo., is distributing a folder relative to shaft sizes used in its industrial motors. The company has also issued bulletin 129, which describes and illustrates other important features of Wagner Pow-R-full motors.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MACMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, January 28, 1922 — *Number* 4

What Forces Are Potent in Shaping Railroad Electrification Progress?

THE valuable paper on heavy electric traction in America, prepared by George Gibbs for the ninth congress of the International Railway Association, occupies eighty-four pages in the December, 1921, Bulletin of this association. It contains a wealth of timely data and should be studied carefully by all who wish to be informed on the subject. As is expected in a paper of this kind, Mr. Gibbs also expresses his opinion as to the future of heavy electric traction and as to the relative merits of competing designs of locomotive drives, motors, working conductors, etc. He concludes that, except for the recent setback incident to the war, electrification plans are proceeding normally. He concludes also that high voltage, with overhead contact, is essential in heavy traction, and he leans toward alternating current as superior to direct current, while keeping a mind open as to the possibility of the development of superiority in systems other than that which now seems to him to be best.

Mr. Gibbs expresses concern as to possible interference with the orderly progress of electrification by the operation of influences from outside the steam railroad field which are making themselves felt in this movement. He has in mind the danger that power, telephone, telegraph and manufacturing interests may unduly urge their ideas on the railroads, influencing the latter to adopt what may not be in their best interest. This point raised by Mr. Gibbs merits consideration and might as well be discussed fully and frankly at this time by all concerned. Some pertinent questions are these: Are these outside interests, as well as the general public, entitled to "butt in" on this matter at all? If they are, what form should their contentions take? Is there any way by which harmony, if not unanimity, of opinion may be insured? Here are a few thoughts by way of answer:

Railroad transportation is so fundamental a necessity that every person in the country is involved in its success. The cost of living and doing business is so dependent on it that if anything can be done to reduce the cost the people are for doing it, especially if their own comfort, safety and convenience are served at the same time. The railroads, also, are using up the country's fuel at such a rate as to alarm every one who is mentally responsive to data. Public sentiment is therefore going to have a powerful influence on the thinking of executives, because the public and the railroads are essentially one. The widespread and increasing popular and railroad interest in electrification indicates the trend of the times.

Again, assuming a reasonably prompt response to economic and popular demands on the part of railroad executives, it will be necessary for manufacturers of electrical equipment to be ready to supply such equipment, as the requirements arise, with celerity and certainty of satisfactory performance. They must therefore be alert and aggressive early in the game. Their side of the problem should be viewed sympathetically, in spite of the fact that they, like the railroads, are in business for profit. They cannot furnish what the railroads need, and so make the railroads more profitable, without co-operation.

As to the power supply companies, they will be expected to furnish cheap and reliable power for railroad operation. Hence they must be ready to do this, but they cannot do it without the help of the railroads. And the telephone and telegraph companies, of course, are on the lookout so that their circuits will not be interfered with unduly as the railroads take more and more electric power.

All of this points to the need for the various, and in a way conflicting, interests to get together, preferably under the auspices of the steam railroad organizations; another illustration of the good that could be done by an "American Committee on Electrification." This paper has already urged that the associations concerned get together to form such a committee.

The railroads of the country are so vast a proposition that it is not to be expected that so radical an innovation as electrification can be introduced wholesale. It will take a long time and much money to apply electric motive power even in those sections of railroads which logic and economics indicate to be ripe for electrification now. Progress should not be too fast; as Mr. Gibbs suggests, the "state of the art" does not warrant undue haste. All that can be done now is to prevent waste and lost motion in the operation of the powerful forces within and without the railroad organizations which are acting to bring electrification about.

Car Design Is Still in a Formative State

THE use of turnstiles on one-man cars in Syracuse and Utica, where seventy-five of these cars are in use, emphasizes the fact that car design is still in very much of a formative state. At several times since street cars have been in use it has been thought that car design was pretty well standardized. Then some radical improvement has thrown the whole subject open again. One instance, of course, was when the pay-as-you-enter principle was generally adopted some twelve years ago. After car design became standardized fairly well for this system of fare collection the adoption of pay-as-you-leave in many cities again upset previous standards. Then came the one-man idea to destroy other traditions.

The idea of using a turnstile on a car is not, of itself, an entirely new idea, though formerly the idea was to use it for registering the passengers as they entered a pay-as-you-enter car. In this case, however, the turnstile would have to be in a part of the car where room is very valuable. With pay-as-you-leave by the front platform, however, on a rebuilt double-end car, the rear platform can be used for a turnstile

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without loss of much valuable space, and in Syracuse and Utica it has been found that the same is true also if the turnstile is placed at the center door of a Peter Witt car.

Mr. Sweet's paper does not describe what will necessarily be a permanent feature of future double-truck one-man cars. It is an effort, like the other variations of the original one-man car design, toward improvement along certain lines. This desire for change is not an indication that the original one-man car design was defective. Rather, it proves that the one-man principle, as developed in Fort Worth and elsewhere, was so great a success that its field of application far exceeded the expectations of at least most of those who recognized its good features from the first. From the idea that it is applicable only to comparatively scant traffic and to a small car, it has been found that the principle is adapted to heavy traffic and large cars, so that it is not surprising that modifications should have been made in the original design. In fact, the greatest developments of the immediate future seem to be along the line of double-truck one-man cars and how best to secure passenger interchange in the minimum time.

It may be said that one-man car design is now centering around three different types of cars. One of these is the original Birney type. The second is the longer car with nine windows and either single or double trucks, with separate entrances and exits, either together, as in Baltimore or Chicago, or separated, as in the Syracuse and Utica cars. The third type is the still longer car having, say, ten to twelve windows and capable of operation by one man during light hours of traffic, but fitted so that it can be used also for two-man operation. Such a car could perhaps also carry multiple-unit equipment.

"Said the Next Mayor of Boston to the Mayor of New York—"

"I wish for the Mayor and his associates a most successful administration, and I trust it will be my opportunity and privilege to come here from time to time to secure direction and advice and help in the matter of the government of our smaller city from the government of the foremost city in the entire world." . . . *Excerpt from the speech of Mayor-elect James M. Curley of Boston at a recent meeting in New York, where Mayor Hylan and his associates were discussing transit matters.*

PRESUMABLY the Mayor-elect of Boston dropped in at this meeting of the New York Board of Estimate to get a few pointers on how to handle unruly traction magnates, and how to secure and preserve the sacred 5-cent fare for the people. In New York one still enjoys the privilege of paying the good old-fashioned nickel fare, but the degree of one's enjoyment is somewhat tempered when one finds that the privilege is repeated about every time one changes cars. For receivers and courts, with supreme indifference to the political speeches of Mayors and others, have turned back leased lines to original owners, and told them to go ahead and operate them on their own hook, and make a profit if they can, on a 5-cent fare. The result is that the free transfer is practically extinct in New York.

In Boston, on the contrary, where the people are mulcted (to use a word popular with our best politicians) 10 cents for a ride on the traction lines, they at least have the more substantial privilege of completing their ride to any part of the system in the metropolitan district for the one fare. And approximately 20 per cent of all the riders are getting the benefit of the local 5-cent fare for short rides in suburban districts.

But genial "Jim" Curley feels that the people are paying too much. At any rate, that is what he endeavored to make them believe in his recent whirlwind campaign which landed him the mayoralty of Boston against the opposition of practically all the newspapers and a combination of the Boston Republicans with most of the strongest Democrats in that stronghold of New England.

If Mr. Curley thinks he is going to improve the transit situation in Boston by getting it into anything like the present condition of New York's, then the car riders of Boston will soon be deserving of all the sympathy they can get.

Of course a 10-cent fare does look big! It probably seems like quite a hardship to some of the regular patrons among the working people who must ride two or more times daily. However, under the management of the present trustees, assisted by the executive officials of the Boston Elevated Railway, the Boston public is now receiving a high grade of service. Whoever is interested enough to take the trouble to investigate need have no difficulty in assuring himself that the revenues received from the riders are all being spent for the ultimate good of the car rider himself. Several millions of dollars annually are being spent for extraordinary maintenance and rehabilitation. Miles and miles of track have been rebuilt. Ancient cars have been scrapped literally by the hundred, and modern equipment has been substituted. The great system, which was starved to the very verge of dissolution on the old 5-cent fare, is being revitalized and placed in a condition to give the community the kind and degree of service which every large urban center should possess for its own welfare. Recent financial reports indicate that a substantial surplus is being earned, which it is said will be applied to repaying to the Commonwealth of Massachusetts, and the city of Boston and surrounding towns, the sums raised by taxation to support the road during the first year or two of trustee management before the property could be got on a self-supporting basis. Now it is self-supporting, while in New York, at least on the rapid transit system, taxes are higher in order to carry passengers at less than cost.

When the tax rate in Boston begins to show concrete evidence of abatement, as the result of the present methods of management of the Boston traction lines, it is not unlikely that the enthusiastic disciple of Hylan methods may find some lack of support among the followers if he tries to tear down the constructive program now in progress. The local 5-cent fare scheme has made a lot of friends in the short time it has been in effect, and the prospect of a reduction in the basic 10-cent rate seems not so remote but that it may occur to steal still further some of Mayor Curley's favorite thunder.

In view of recent developments, it would seem desirable for the railway interests in other communities where political hostility exists to make a pretty thorough study of the New York situation and the facts which are being brought to light by the various investigators. They might well undertake a little campaign of education to show their own political friends as well as enemies wherein they may be better off after all than the "foremost city in the entire world" in spite of its heralded adherence to the 5-cent fare.

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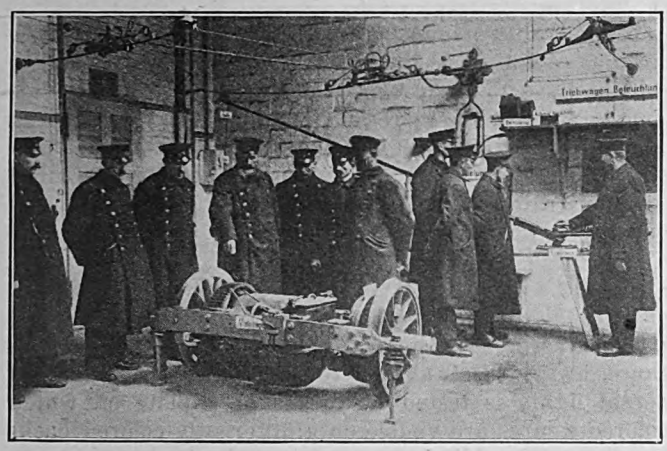
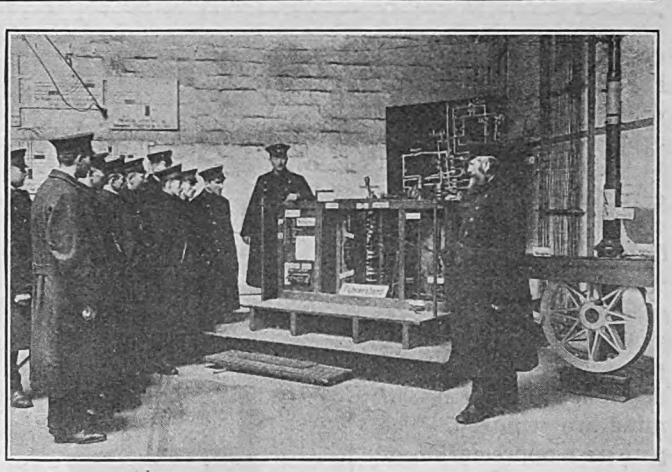




VIEW IN MOTORMEN'S SCHOOL IN BERLIN
At left, explaining the mechanical details of the car. At right, a lesson in controller connections

Psychological Tests for Motormen

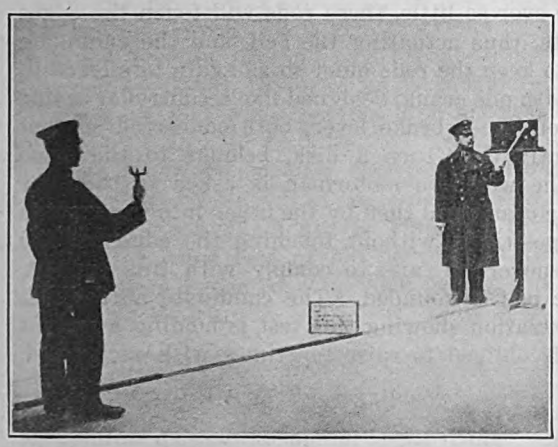
Candidates for the Position of Motorman in Berlin Have to Pass a Series of Physical and Psychological Tests Before Being Accepted—Important Savings Are Effected by Engaging Only Those Men Who Have Been Shown by These Tests to Be Well Suited to the Work

BY DR. ALFRED GRADENWITZ
Berlin, Germany

THERE is a growing tendency in Germany at present to increase the efficiency of workers in all walks of life by submitting every candidate for a profession or calling to elaborate psychological tests. This movement is especially marked in the case of lines of work such as airplane pilot, locomotive engineer, automobile driver and street-car motorman where property and human lives are jeopardized by unskillful operators.

The engineer-manager of the Berlin Street Railway, K. A. Tramm, has installed at the Lichtenberg depot a testing laboratory where all applicants for the position of motorman, previous to their entering the training school, undergo an exhaustive series of psychological tests. The apparatus used in these tests is exceedingly ingenious and was designed by Mr. Tramm.

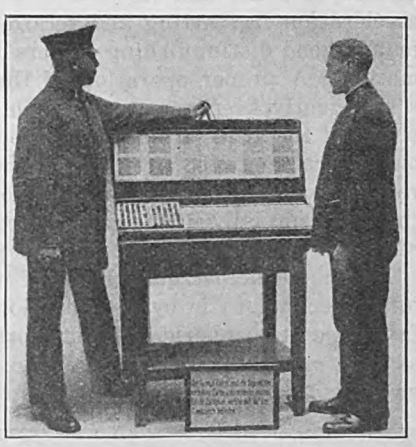
Obviously, one of the first requisites for the position

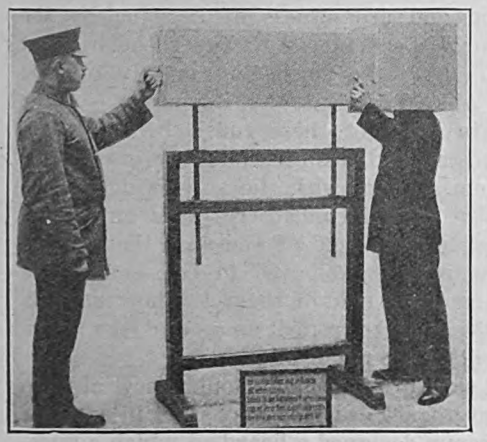


AT LEFT, TESTING FOR SIGHT
The candidate receives cast-iron letters and is asked to hold them in the same position as they appear on a board at some distance.

AT RIGHT, TESTING FOR COLOR BLINDNESS
This is done by a plate on which colored figures appear on different colored backgrounds.

THREE LOWER VIEWS
In the first test the candidate's ability to discern objects inside a case covering his head is ascertained. In the second test he has to hold two rods steady in slots in a metal plate; if not, a bell rings. The third test is somewhat similar to the second, except that disks fitted with handles to represent the controller and brake handles have to be turned steadily without being allowed to touch an outside plate.





TESTING THE CANDIDATE WITH A HOOD FOR "NIGHT BLINDNESS"

TESTING THE STEADINESS OF THE CANDIDATE'S HANDS

TESTING FOR SKILL IN STEADILY TURNING THE CONTROLLER AND BRAKE HANDLES

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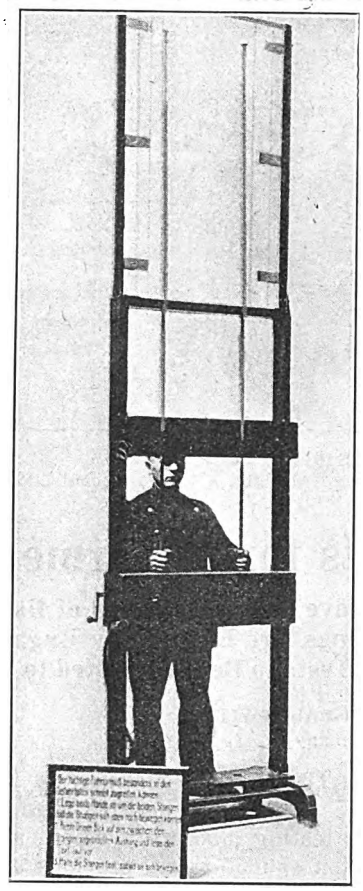
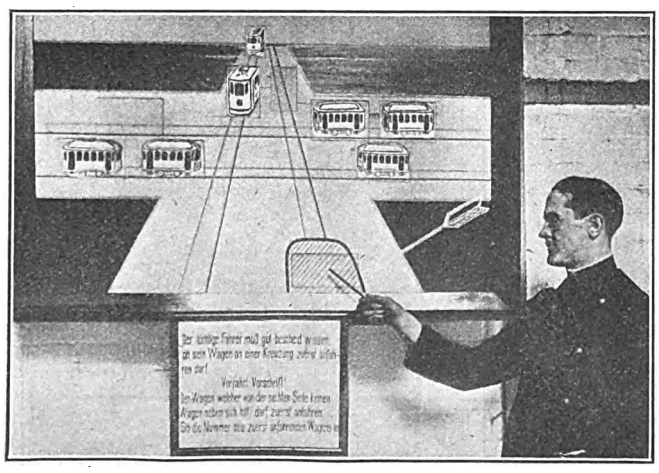
of motorman is a good eye and sufficiently keen sense of hearing. In order that any obstacle to traffic may be perceived in time, a sufficient concentration of attention is urgently required. To enable operations in case of danger to be carried out rapidly and properly, promptness of decision and presence of mind are required. The proper appreciation of distance, curvature and other factors of length necessitate a sense of dimensions. These facts should not only be perceived properly and promptly, but they should be permanently present in the motorman's mind so that, particularly in operating the controller and brake, he may be able beforehand to take account of local conditions of the track.



TESTING THE CANDIDATE'S PROMPTNESS OF ACTION
He must be ready to catch two vertical rods, when they begin to fall.

To understand instructions and signals requires a good memory. To gage the proper traveling conditions of a car and its acceleration in starting and retardation in braking demands good distinguishing powers for various kinds of motion. A proper operation of the controller requires a sufficiently keen sensitiveness in the joints to movements of the arm. Finally, the proper knowledge of the mechanical and electrical features of the rolling stock requires certain technical ability so that any defects in the car, especially in the case of trouble, may be recognized and remedied as promptly as possible.

All the principal qualities just mentioned should be influenced but little by the duration of the service, unfavorable atmospheric or other working conditions such as day or night service, prolonged intervals between meals, etc. In other words, the motorman should possess a considerable amount of bodily endurance and resistance, in addition to the mental and physical capacities which have already been enumerated. After this enumeration of the more important faculties required in a motorman, the methods of testing for them, as followed on the Berlin tramway system, will be described and illustrated.



TESTING MENTAL ALERTNESS AND UNDERSTANDING OF TRAFFIC RULES
On this artificial track there are suddenly lighted some of the model cars shown in the figure. The candidate then has promptly to state the car entitled to start first.

HOW THE TESTS ARE CONDUCTED

To test a candidate's visual powers, he is handed some cast-iron letters and asked to keep them in the same position as he sees them on a board installed some distance away. His ability to distinguish the various signal lights is tested by means of a plate on which colored figures are visible on a differently colored background. Color-blind persons are, of course, unable to read these figures. Finally, a good motorman should be able to find his way even in the dark. In other words, he must not be "night-blind." This question is ascertained by means of the following test: The candidate is directed to insert his head in an oblong casing closed on all sides, and after waiting for from one to two minutes, or just the time required to accommodate himself to the darkness, he is asked to state how the letters seen inside the casing are standing—upright, at an angle or upside down. A slide operated by the inspector in charge of the test at the front of the casing allows the darkness to be reduced or increased at will.

Another set of tests is intended to examine the steadiness of the hand. With one apparatus designed by Mr. Tramm, the would-be motorman is asked to seize the handles of two vertical rods which fit with a certain amount of play into slots in a metal plate. As long as he keeps his hands quiet, the circuit of an electric bell is interrupted. As soon, however, as his hands begin to tremble ever so little, these rods will touch the edges of the slots, thus actuating the bell, and the candidate must try to keep the rods quiet so as again to silence it.

A test with one crank, designed like a controller crank, and another like a brake lever, both connected so that independently they turn a disk, belongs to the same group. The would-be motorman is asked to turn the disk by one crank and then by the other into the various traveling positions, without touching the edges of the slot. Whenever he fails to comply with this request, an electric bell is sounded. The candidate at the left in the illustration showing this test is holding a weight which he is obliged to raise ten times with each hand.

TESTS FOR PRESENCE OF MIND

The tests which are intended to determine the presence of mind and promptness of decision of the applicant are likewise considered to be of the highest importance. An apparatus consisting mainly of two vertical rods is alike practical and ingenious. After placing himself in front of these rods, the candidate must put his hands around them without, however, actually touching them. Then, while he is looking at the objects in front of him, he must try, as soon as the rods start falling, to seize hold of and stop them. The farther down the rods are allowed to fall before the man succeeds in catching hold of them, the less may his promptness of decision be relied upon and the more unsatisfactory will be the result of the test.

Inasmuch as a skillful motorman should know at once whether his car at a track crossing may start in advance of others, Mr. Tramm designed a board on which a number of pictures of street cars are mounted and can be set so as to occupy various positions with regard to

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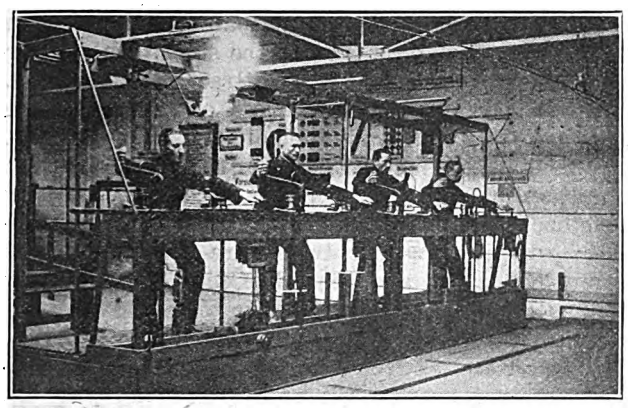
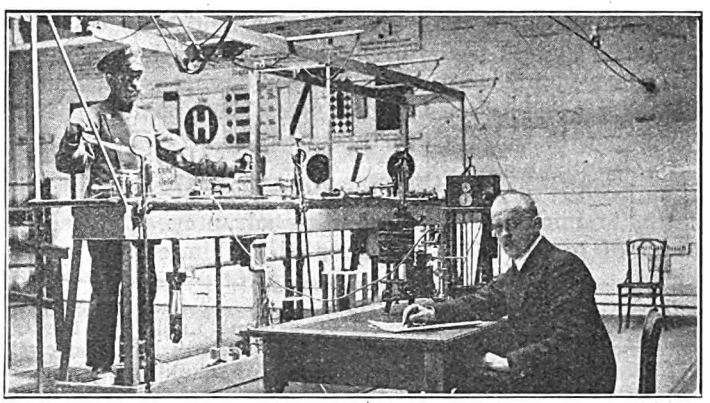




TESTING THE "NERVE" AND PRESENCE OF MIND OF WOULD-BE MOTORMEN

At left, the candidates are frightened by heavy electrical discharges and their behavior in the event of an accident is thus tested. At right, the man at the controller handle is suddenly to be startled in some way and his action observed. Mr. Tramm, who has charge of these tests, is seen at the table in the foreground.

one another. When the instructor actuates an electric switch, these cars can be lighted up in any desired combination. The candidate then should immediately state the number of the car entitled to start in advance, according to the traffic rules in force.

It is, of course, of the highest importance to ascertain how a candidate will behave in the event of a danger, whether he will lose his wits to the extent of letting go the controller handle and brake and passively stand by, or whether he will promptly take any measures required for the safety of his car and passengers. To determine this, the man is placed before a controller handle, and while he is practicing with it he is frightened by a sudden report, a short-circuit flash passing before his eyes or the floor yielding below his feet. If he loses his presence of mind in these circumstances, the company knows that he should not be intrusted with the care of a car. If, on the other hand, he promptly performs such manipulations as were recommended to him in the event of anything unforeseen happening before his eyes, he is considered to possess the presence of mind required for his responsible profession.

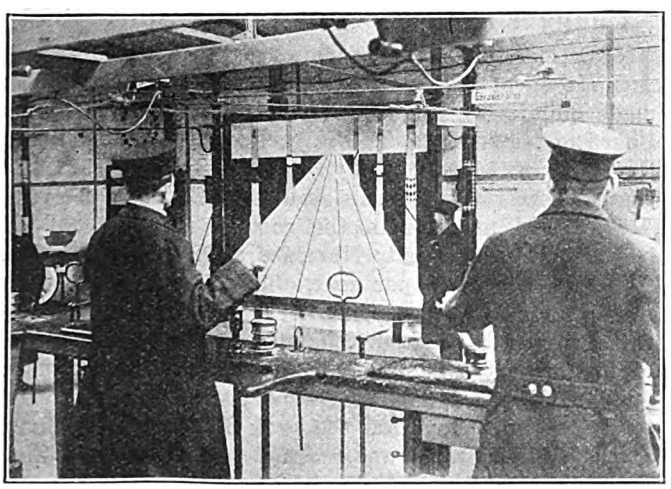
Two illustrations show this test. In one a fuse is glowing over the heads of three neophyte motormen. In the other, the candidate is standing at a controller ready for some test of his nerves, yet to be applied. Mr. Tramm is seated at a table in front of him, ready to record the results.

Another test of cool-bloodedness or "nerve" is provided by another board painted to represent a miniature track. Electrically lighted obstacles suddenly appear on the track, and the presence of mind of the prospective motorman is gaged by the rapidity with which he turns his dummy controller handle to the off position and applies the brakes.

Finally, tests of intelligence are made to ascertain the professional fitness of the would-be motorman. To make sure that he is capable of understanding certain technical facts, he examines under an instructor drawings of the machinery on a car illustrating the motor suspension with gearing, and is asked in which direction the car will travel in case the pinion and then the gear rotates in a given direction, whether the pinion or the gear has the greater number of revolutions per minute, in which direction the brake lever should be moved to stop the car, etc.

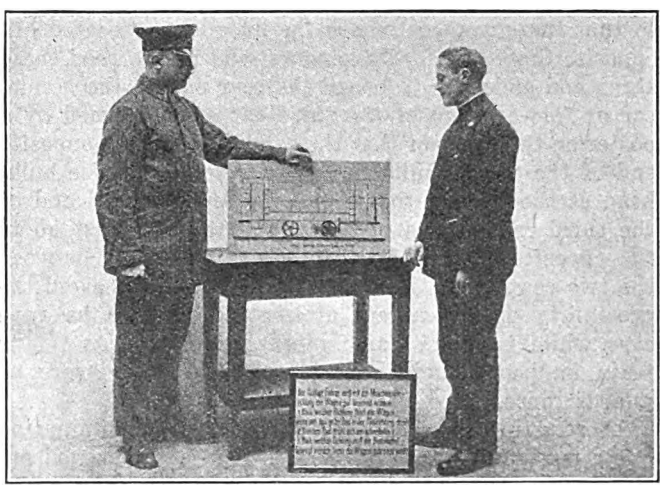
PSYCHOLOGICAL TESTS FOR CONDUCTORS

A similar testing laboratory is now being installed for would-be conductors. The management proposes in this laboratory, by means of specially designed apparatus, to test applicants for the position of conductor as to their memory of persons and streets, their ability simultaneously to give close attention to different events, the acuteness of their touch in judging the fineness of different thicknesses of paper, etc. Especial importance is attached to their rapidity of per-



TESTING PRESENCE OF MIND

This board represents a track on which electrically lighted obstacles suddenly appear. The candidate for motorman is at a dummy controller stand, and the rapidity with which he acts determines the degree of his mind.



TESTING THE MAN'S SENSE OF MECHANICS

He has to answer such questions as: "In which direction does the car go when the yellow wheel or pinion is turning in the direction of the arrow?" "In which direction should the brake handle be moved to brake the car?"

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ception, on which their skill in distinguishing coins depends. This is tested by allowing the shutter covering a hole in a black board to be open during a fraction of a second and asking him how many black points were to be seen through the aperture.

ADVANTAGES CLAIMED FOR THE TESTS

Mr. Tramm claims the following advantages for the series of tests devised and adopted by himself:

1. An increase in the safety of service;
2. A reduction in working expenses;
3. Avoidance of employment of persons unifit for the service and therefore either inefficient or actually dangerous;
4. Avoidance of any unnecessary loss of time in instructing persons unfit for the position of motorman;
5. A fair determination of the faculties of every candidate;
6. A possibility of producing conclusive evidence of care in selection of men in the case of negligence damage suits.

Two views are given at the head of this article of the Berlin school for motormen. All of the men shown in these views as engaged in learning about the equipment of a car have passed the tests for applicants for the position of motorman, already mentioned.

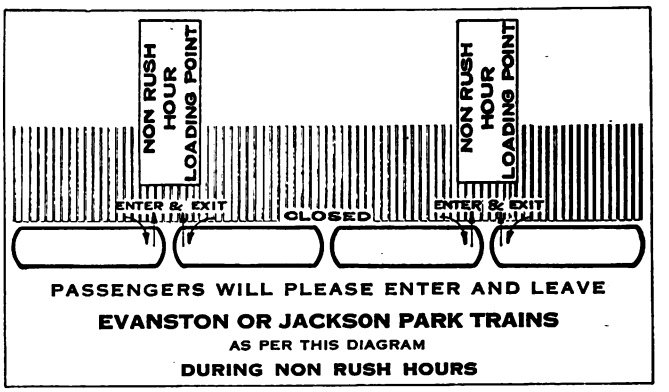
One Guard Omitted in Non-Rush

Chicago Elevated Railways Makes Saving by Operating Four-Car Train with but Two Guards—Public Was Fully Informed in Advance

ON OCT. 18 the Chicago Elevated Railways began operating four-car trains on the Evanston-Jackson Park line with only two guards between the hours of 9 a.m. and 4:30 p.m., two hours in the evening, and all day Sunday. Thus one guard is eliminated for each four-car train in service during these periods. While this economy measure was considered by some to be a radical step, B. J Fallon, general manager, stated on Nov. 11 that up to that time the company had received two letters and four telephone calls as the total public comment on the matter. This may be partly accounted for by the complete plans laid by the company to inform the people in advance of the change as to how they should enter and leave trains. On every platform two signs were erected and designated as Stop 1 and Stop 2 for use during non-rush hours. These indicated where passengers should stand to board the cars. As the two guards employed are used between the first two and between the last two cars, these stop signs were spaced two car lengths apart and trains are brought to a stop so that the entrances where the guards are located are opposite these signs. Passengers who fail to read these signs and endeavor to board the rear end of the second car or forward end of the third car are informed by a poster on the car door that they should go to the opposite end of the car. Similarly, a poster inside on the bulkhead at the rear of the second car and forward end of the third car notifies passengers that they must go to the opposite end to leave the car. The doors between the two center cars in the train are locked to avoid the possibility of passengers attempting to pass between cars while moving, which might be dangerous if the train happened to be on a curve and there were no guards there.

In studying out the possibility of thus eliminating one guard, the feasibility of the plan was reasoned out this way: The experience in the operation of the elevated trains in Chicago is that the first and last cars of all trains are always the heaviest loaded. This is because but one door of each of these cars is used and hence they are warmer in winter than those cars which have doors open at both ends at the stops. In summer the end cars are cooler and hence attract the passengers. Since these cars are loaded heaviest, and have only one door in use, they control the time of stop. Consequently, it was felt that the length of stop of the train would not be increased by using but one door on all cars. Closing up one door on all cars makes them all equally comfortable in winter. Two-car trains are always operated with but one guard and hence but one door per car is used, and so it was deemed feasible to couple two two-car trains together in the same manner.

The bell cord between the two center cars is connected together so that the rear guard can pass the signal through two cars to the forward guard. Incidentally, with the elimination of the one guard, it is necessary to relay the signal but once, and if one were



DRAWING HANDED TO ELEVATED PATRONS TO EXPLAIN METHOD OF BOARDING TRAINS DURING NON-RUSH HOURS

to figure close, it might be possible that the elimination of one passing of the signal might save a slight amount of time on the length of stop.

When the scheme was first put into effect special employees were stationed on every platform and on each train for two days to carefully watch how the scheme worked out, to note the attitude of the public and to report in detail their findings to the general manager. The card reproduced herewith was passed out to every passenger for two days and this undoubtedly also aided in avoiding confusion. The scheme went into effect without any difficulty and is considered a success.

Changes in the Cost of Living Since 1914

INFORMATION in the form of a report on changes in the cost of living in the United States has been made public by the National Industrial Conference Board of New York. This report, entitled "Changes in the Cost of Living: July, 1914–November, 1921," is the eleventh in the board's studies of the cost of living.

The total increase in the cost of living from the beginning of the war to November, 1921, the investigation shows, was 63 per cent. The rise in cost of the major items in the wage earner's family budget during this period is estimated to have been as follows: Food, 52 per cent; shelter, 69 per cent; clothing, 61 per cent; fuel and light, 79 per cent; sundries, 78 per cent.

The report shows that the peak of the cost of living in the United States was reached in July, 1920. Since then, the total cost of living has decreased 20.3 per cent. Food has decreased 31 per cent; clothing, 39 per cent; and sundries, 4 per cent; while shelter has increased 7 per cent, and fuel and light 8 per cent.

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Electric Traction on Heavy Traffic Lines

Railroad Electrification in America Is Covered in a Paper Prepared for the Ninth International Railway Congress by George Gibbs—He Says It Is Too Early to Standardize, but Believes that Alternating Current Equipment Is More Promising than Others in This Field

IN HIS report on heavy electric traction in America, prepared for the ninth congress of the International Railway Association, George Gibbs, consulting engineer, Pennsylvania Railroad, summarizes the situation and gives his opinion as to the present status and future prospects of heavy traction on this continent.* The following abstract brings out some of the high points of his paper:

The past six years have witnessed a condition of arrested development in electric traction, although between 1910 and 1920 the following increases occurred: In aggregate mileage equipped, from 411 to 1,527 of route, and from 873 to 3,370 of track; in number of electric locomotives, from 136 to 371, and in number of motor cars, from 613 to 1,508.

The working conductor, by means of which power is made available at the moving train, is perhaps the most important feature of an electric traction installation. Two kinds of working conductor are in use, the third rail, which is the type first used successfully for heavy traction, and the overhead working conductor, which promises to become standard for heavy electric traction. The advantages and disadvantages of each of these are given in Table I.

Why Overhead Working Conductor Is Preferred

On account of the objectionable features listed in Table I, third-rail traction may be considered obsolete in America for heavy railway electrification. The important features aimed at in the design of overhead working conductors are sparkless current collection, strength, durability and cheapness; also, it is especially important that the collector wire shall be free from hard spots at the suspension points, pulloffs, switches, etc. The device is essentially one for small currents.

At the present state of the art the 11,000-volt alternating-current system has been demonstrated to be well adapted for current collection from an overhead conductor under all conditions met with on American railways; it is reliable and economical in upkeep. The success of the 3,000-volt direct-current system, as regards current collection, seems less certain and remains to be demonstrated for some of the difficult conditions to be met.

Substations for the alternating-current system are relatively simple as they contain no moving apparatus and require only occasional inspection and attention. Direct-current systems require transformers, switching apparatus for the high-tension current rotary converting apparatus, etc. This combination is relatively costly and complicated and requires attendants at all times. It has been proposed to do away with constant attendance by installing automatic control, but it is too early yet to pass upon the results obtained by automatic substations or to assign a definite field for their use. They may be used on important traction installations on steam railways, but as an adjunct only, to assist and simplify the work of the regular attendants in emergencies.

*The full text of Mr. Gibbs' paper will be found in the Association's Bulletin for December, 1921. The paper contains an extended compilation of data on heavy electric traction in America.

No approximation to a standard electric locomotive design has been arrived at. The problems awaiting solution at present are mechanical rather than electrical. A suitable design for a heavy modern steam locomotive has been evolved after years of development, and it is not a simple matter to produce an equivalent combination of elements in an electric locomotive, especially for one which will equal the powerful tractive effort of a modern steam locomotive.

Table I—Advantages and Disadvantages of Third Rail and Overhead Working Conductors

Third Rail

Advantages	Disadvantages
a. It permits the conduction and collection of very large volume currents.	a. It does not provide continuous contact through complicated track switches and crossings.
b. It is located conveniently for inspection, repair and replacement.	b. It obstructs the track structure and interferes to some extent with maintenance of permanent way and track. It obstructs the spaces between tracks in yards and thus menaces the safety of employees in shunting work.
	c. It cannot be entirely inclosed and involves risk of contact by employees and others, the serious consequences of which increase rapidly as the voltage in the conductor is raised.
	d. Power to the train is subject to interruption when snow or sleet collects on the conductor.

Overhead Working Conductor

Advantages	Disadvantages
a. It provides continuous contact at the train in places of complicated track layouts.	a. It is difficult to collect large currents from it.
b. It does not interfere with the maintenance of permanent way and track, and it may be employed safely with very high voltages.	b. There is difficulty and delay in making repairs to the contact system where traffic is heavy.
c. Uninterrupted service during sleet storms is assured from it to a greater extent than is the case with third rail.	c. It is difficult to install in cases of limited clearances at bridges, tunnels, etc.

In producing the modern economy in railway operation a factor has been the increase in weight allowed on each driving axle of a locomotive, which was a necessity because the number of driving axles for steam locomotives cannot be indefinitely increased. In the opinion of many (of whom Mr. Gibbs is one) axle weight has been carried too far, track conditions considered. In adopting electric traction there is a possibility of returning to moderate wheel weights for locomotives without disturbing present operating methods; it can be done by bringing together locomotive units to make one compound structure singly controlled. This idea has not been carried into effect chiefly because the high first cost

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of such an electric locomotive has deterred designers from proposing it.

Generally speaking, there are three different types of drive in use on American locomotives, with many different types of wheel grouping. As to the driving mechanism, the following classification applies: (1) Drive by gearing motors directly to the axles; (2) gearless drive by mounting motors on or around axles; (3) geared or gearless drive by means of cranks and rods.

Geared drive has been used extensively, especially for light work. Thus out of 390 locomotives in use on American railways 223 have some form of geared drive with or without flexible connections.

Gearless direct drive is found in two forms: (a) The New York Central type, in which the motor armature is rigidly mounted on the axle and is free to revolve between bipolar fields carried on the locomotive truck frame; (b) the quill drive, as used on the New Haven

In the geared form of rod drive, as used on the Norfolk & Western, each drive element of the locomotive has two motors mounted on the truck frame. The armatures carry pinions which mesh into a gear on each end of a jackshaft, and the latter is placed between the motors with its axis in the horizontal plane of the driving-wheel axles. This jackshaft drives the wheels by means of rods and pins. A further application of this arrangement is used on a locomotive built for the projected mountain-grade electrification of the Pennsylvania.

All forms of geared-motor rod drive permit of great tractive capacity and give fairly high center of gravity, both for the heavy masses and for the locomotive as a whole.

The latest heavy high-speed passenger locomotives of the New York Central are of the gearless type, with motors mounted rigidly on the axles and with a wheel

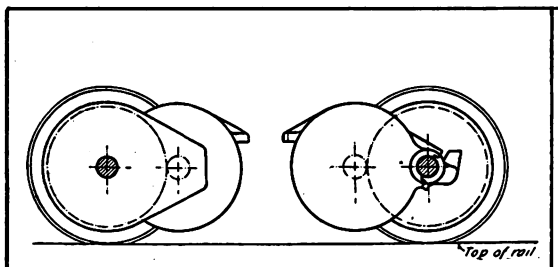

FIG. 1

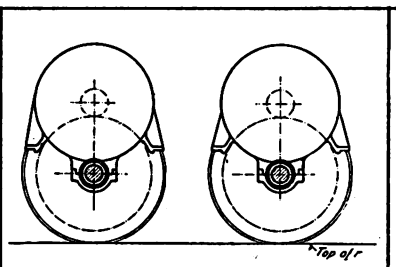

FIG. 2

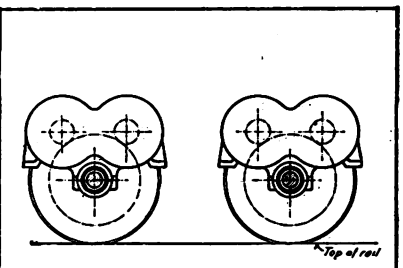

FIG. 3

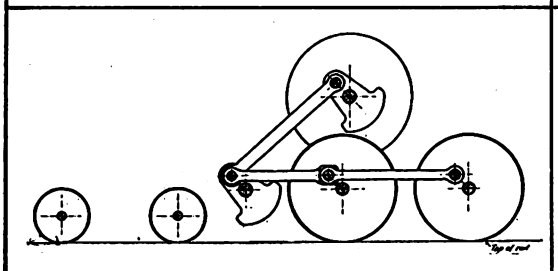
FIG. 4

Fig. 1—Direct axle-geared drive.

Fig. 2—Single motor gear and quill drive.

Fig. 3—Twin motor gear and quill drive.

Fig. 4—Rod drive with gearless motor (Pennsylvania passenger locomotives).

Fig. 5—Gear and side-rod drive (Norfolk & Western locomotives).

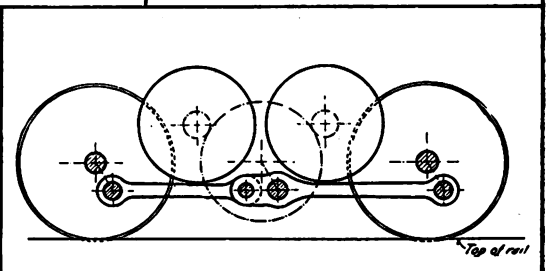

FIG. 5

Railroad, in which the motor is mounted on a quill around the axle and is carried by the spring-supported frame of the locomotive. The first of these types has been used for high-speed passenger locomotives, with direct-current motors, on the New York Central and Milwaukee Railroads. The center of gravity of the motor masses is low, but the type is not suitable for slow-speed work because of the low output per pound weight of the motors. With the quill drive a large motor is permissible and its weight is wholly spring-supported. The center of gravity is low, but not so low as in the New York Central type.

Several designs of geared or gearless rod drive are in use in Europe, but the type has been adopted for only two important electrifications in America. These are the Pennsylvania Railroad Terminal at New York City and the Norfolk & Western Railway electrification in the Allegheny Mountains.

The Pennsylvania locomotive has a single large motor mounted on top of the frames in the cab and connected by rods to quartered cranks on a jackshaft journaled in the frame and in the horizonal plane of the driving-rod axles. From the jackshaft, rods drive the wheels. Thirty-three of these locomotives have been in use for eleven years and have made an aggregate mileage of 11,000,000. The locomotives have shown themselves to be reliable in service and of excellent tracking qualities.

arrangement of 0-4-4 + 4-4-0. There is a single cab structure carried by center plates on an articulated subframe. The running gear consists of four bogie trucks with all axles equipped with motors. The intermediate bogies are rigid in respect to the subframes, and the forward and rear bogies swivel on the subframes. These bogies are provided at the inner end with an extended arm which couples to the frame of the middle bogies and restrains the motion of the swiveling bogies by means of an adjustable slide.

The Chicago, Milwaukee & St. Paul uses three different types of locomotives as follows: (1) The freight locomotive having a wheel arrangement of 4-4-4 + 4-4-4, with motors axle-mounted and geared, each axle being equipped with a motor. (2) A type of high-speed passenger locomotive with a wheel arrangement of 2-4-8 + 8-4-2 and with a running-gear composed of four trucks, the two end trucks having two axles and the center trucks four axles each. The trucks are coupled by ball-and-socket drawbars. Excessive lateral oscillation is restrained by an unsymmetrical mounting of the body, also by sliding side bearings. The superstructure is in three sections, the end sections containing control apparatus and providing a housing for the motorman, the central section carrying the train-heating equipment. (3) A passenger locomotive with a 4-6-2 + 2-6-4 wheel arrangement and with a single cab mounted on sub-

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frames by center and spring side bearings. The running gear consists of two frames set back to back and connected by a swiveling drawbar, each half comprising the same wheel grouping as a Pacific type steam locomotive, *i.e.*, a four-wheel guiding truck, three driving axles and a two-wheel trailing truck. The motor arrangement involves twin instead of single motors and a geared quill drive direct to the axles.

The latest heavy, high-speed passenger locomotives of the New York, New Haven & Hartford Railroad have a 2-6-2 + 2-6-2 wheel arrangement, with six twin motors geared to a quill drive. A single cab structure is carried on an articulated substructure by center plate and side friction bearers. Each unit of substructure, or truck, has three driving axles and two radial single-axle trucks. The same railroad has in service three passenger locomotives of lighter capacity, with wheel type 2-4 + 4-2. The cab is carried by two six-wheel articulated subframes. Each of these consists of two driving

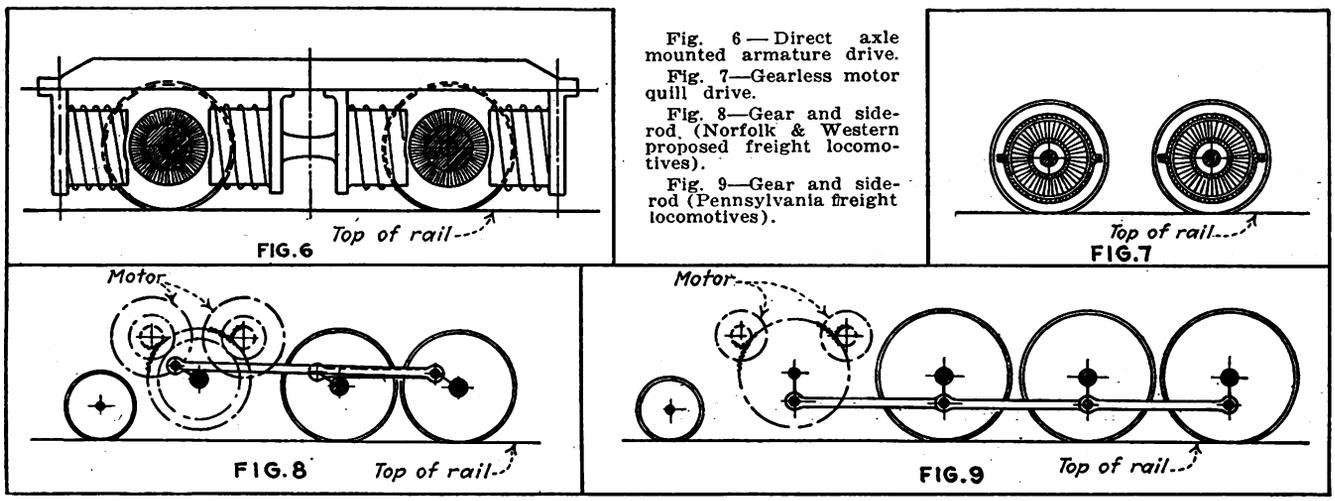

Fig. 6 — Direct axle mounted armature drive.
Fig. 7—Gearless motor quill drive.
Fig. 8—Gear and side-rod. (Norfolk & Western proposed freight locomotives).
Fig. 9—Gear and side-rod (Pennsylvania freight locomotives).

axles with twin motors geared to a quill drive, and one single-axle radial truck.

In 1915 the Norfolk & Western Railway placed in service twelve locomotives with a wheel arrangement of 2-4-4-2 + 2-4-4-2, which are in reality complete double-unit locomotives permanently connected by a drawbar. Each unit has a cab carried on two three-axle trucks connected at their inner ends. Each truck has two driving axles and a radial leading axle. The cab is supported on the trucks by spring cushion friction plates. No weight is carried on the center pins, which serve merely to keep the cab in its proper position on the trucks. Each driving mechanism has two induction motors geared to a jackshaft set between two pairs of driving wheels. The mechanical effort is transmitted from the jackshaft gear to the driving wheels by means of parallel rods.

For a proposed extension to service on the Norfolk & Western a more powerful locomotive has been designed but not yet contracted for. The wheel arrangement is 2-8-2 + 2-8-2, and the cab is mounted on the frame of each half-unit running gear, which consists of four driving axles in one rigid wheelbase of 16 ft. 6 in., and a radial single axle at each end. The motors are of the induction type and are placed outside instead of between the driving axles. Each pair of motors drives two pairs of wheels from one jackshaft. There is no connection between the driving couples.

The Pennsylvania has built a very powerful freight locomotive in anticipation of an extensive electrification of its main line over the Allegheny Mountains. The wheel type here is 2-6 + 6-2. Structurally the locomotive has a single cab mounted on two trucks, forming an articulated wheelbase. Each truck consists of three coupled driving axles and a forward radial single axle. Three-point suspension is secured by equalizing the driving axles, the centrally supported leading truck forming the third point. The cab is supported between the first and second pairs of driving wheels and has two side spring supports. Motors are carried outside the drivers, one pair for each truck. They are of the induction type, each pair meshing into one jackshaft gear. This gear drives the wheels by means of rods.

It is difficult to give precise indication of the probable future trend of American practice in electric locomotive design. The writer's general conclusions, however, are as follows:

The type of drive in which the motors are direct geared to the axles is suitable only for slow-speed locomotives, such as those for shunting or freight service. For the heaviest requirements of freight haulage, however, it is doubtful if this type is the best, because it is difficult to apply the drive to produce a stable wheel grouping; also because the heavy motor masses have a very low center of gravity and the weights which are not spring-borne are considerable. Large motors produce severe side shocks in curving and with track in poor surface, and hub-liner wear is apt to be great.

The quill-driven geared motors should produce better results, but only in degree. A quill drive has not been entirely satisfactory for very heavy service, because mechanically it is difficult to find space for conservatively designed springs. If the quill is not maintained normally concentric with the axle, severe bending stresses are set up in the springs at each revolution of the wheels, whereas a helical spring should be subjected to torsional stresses only.

The type of drive in which the motors are mounted rigidly on the axle requires many axles for heavy traction and a wheel arrangement which is somewhat complicated and unfavorable for tracking. It has been used for high-speed work, however, in cases where the track construction is of the heaviest character and its maintenance is of the highest order. Its field is limited to high-speed service because of the low output of the motors at low speeds.

The type of drive in which gearless motors are

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flexibly suspended around the axles may be used for high-speed passenger locomotives, with either alternating-current or direct-current traction, but it is not an economical type as regards first cost of motors and it has a low center of gravity of the running gear. It is, furthermore, subject to the difficulty of securing durable spring driving mechanism.

Gearless motors with rod drive are suitable for high-speed passenger work and allow the most desirable wheel arrangement and weight distribution for perfect tracking qualities of the locomotive. The motors, however, are large and costly, because of their low speed, and their capacity is limited. The type is not suitable for low-speed service.

Geared motors and rod drive offer the most flexible and promising solution for passenger and freight locomotive construction because of the allowable variation in wheel arrangement and in motor mounting and capacity. This type of drive permits perfect tracking qualities for a great variety of designs and running speeds.

Side rods connecting the various driving wheels are desirable in all types to prevent slipping of independent axles and thus to obtain maximum traction, especially with direct-current motors having series-parallel control.

A combination of driving and carrying axles is desirable, also an unsymmetrical wheel distribution, to assist in proper tracking.

For Suburban Passenger Service 50-Ton, 70-Ft. Motor Car Recommended

The greater number of steam railroad electrifications involve passenger service, frequently of the short-haul, commuter variety. Considerations of obtaining adequate power to maintain exacting schedules and a reduction of idle locomotive movements have led to a desire in America to electrify all suburban services in order to permit the use of motor car trains. The maximum flexibility and relief under this kind of operation is obtained by making each car of the train a motor car, and general practice is tending toward so doing. Best economy in equipment and maintenance cost is obtained by using two motors only and mounting them on one truck.

A modern car of steel construction and about 70 ft. long over all will satisfy these conditions. It will weigh, without electrical equipment but including full passenger seated load, 50 tons. Two motors will give a capacity of about 500 hp. total for the car. With this capacity the most exacting local service schedules can be performed, if all of the cars of the train are equipped with motors.

Such services are now given with alternating current and with direct current up to 1,500 volts. Motor-car equipments for 3,000 volts, d.c., have not yet been under practical trial on any steam railroad in America.

As to trend of practice in American electrification of steam railroads, it is not possible to draw any definite conclusions, except that the field is narrowing to the use of two systems. These appear, in the present state of the art, to be best adapted for heavy and for long-distance railway operation. They are the 3,000-volt direct-current system and the 11,000-volt alternating-current system.

It is too early to fix upon a standardization to an important degree for any system, much less to exclude any promising system, for the following reasons:

1. Data are not yet available to permit a conclusion as to the relative advantages and disadvantages of alternating and direct current.

2. It is too early to determine and fix the features of any one system to the extent required for useful standardization, without restricting the future and desirable development of the system selected.

3. Neither system, as now developed and applied to a typical general case, shows an advantage in first and operating costs.

4. There is danger, in endeavoring now to arrive at one standard system, of being unduly influenced in favor of one which is now enjoying the greatest use, and which may have been the only one available at the time of installation.

It would appear that the development of electric systems is proceeding along normal and logical lines. However, there is some reason to feel that this orderly consideration of the subject may not continue, because of the views which are being expressed by those who are not engaged in operating the railways, but are connected with other industries, including manufacturing, telegraph and telephone service and power generation. While these interests have decided views and are expressing them, the railroads, which must use the apparatus, have not considered it necessary actively to advocate any particular electric system.

The writer wishes not to be understood to advocate any one system to the exclusion of another, but he considers the high-tension alternating current to have at present the greater number of demonstrated advantages for general railway use and to hold out the most promise for the future. Therefore, if it is thought necessary to standardize now, it appears illogical to select the high-voltage, direct-current system, which appears difficult of application to operating conditions.

A Word as to Electrification Economics

As to installation and operating costs, the following may be said: The conversion of steam railways for electric operation remains an expensive proceeding, as it involves a complicated chain of apparatus to replace steam locomotives. The replacement costs can be saved in cases where a new railway is to be built, but in general this is not the problem. No definite statement can be made as to when it will pay to electrify; it will certainly not pay to do so for all trackage of all American railways. The indirect as well as the direct economies may, however, be large in many special cases. In terminals in large cities, on heavy gradients, for suburban passenger services and in certain cases for long-haul services electric traction has been a good investment.

In cost of installation and operation there are no great differences between direct and alternating current. The writer has found, however, that such differences as do exist are in favor of the alternating current.

Ship and Trolley Car in Collision

THE first recorded collision between a ship and a trolley car is reported from Dublin, Ireland. The vessel, a three-masted sailing ship, the *Cymric*, was about to enter the Ringstead Dock and was waiting for the trolley car to cross the drawbridge at the dock entrance, but swaying with the tide her bowsprit projected over the bridge and rammed the car, smashing the windows and terrifying the passengers, without, however, injuring anybody. The trolley car retained its balance and successfully crossed the bridge.

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Why Electrify the Chilean State Railways?

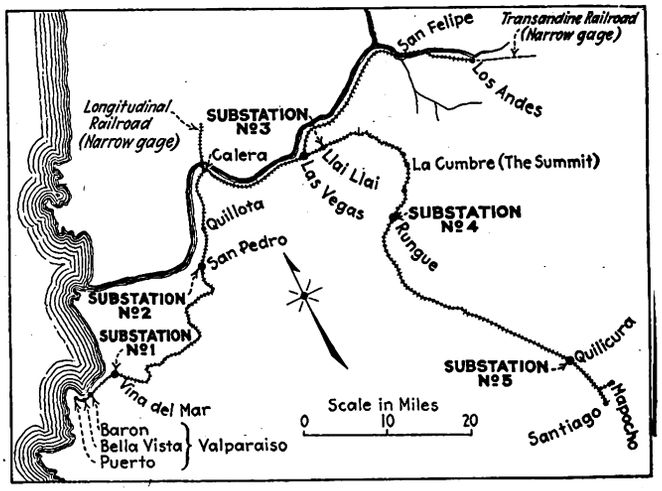
Recommendations of Special Commission Influenced Government to Plan for Extensive Substitution of Electricity for Steam to Save Fuel and Increase Track Capacity—Valparaiso-Santiago Section Selected for Immediate Transformation

THE decision of the Chilean government to electrify at once the State Railways in what is known as Zone 1, surrounding Valparaiso and Santiago, was the result of the work of a commission which reported its findings in 1918 after elaborate study. While the commission was engaged in its work, the congestion in Zone 1, which had become severe on account of the traffic due to the World War, was in part relieved by the purchase of Mikado-type steam locomotives. Traffic demands had reached such a point, however, that a considerable laying of new track was inevitable unless the tonnage over the existing track could be increased. The commission found that electrification was the solution to the problem, particularly in view of the fuel situation, Chile being dependent to a considerable extent on foreign countries for fuel.

In the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 3, 1921, page 991, the general features of this electrification project, involving 144 track miles, were given and illustrated, the statement being made that the initial order for equipment involved an expenditure of $7,000,000. This order was placed with the Westinghouse International Company. The present article elaborates some of the detail suggested there, particularly with reference to track and traffic conditions.

GRADES ARE SEVERE IN ZONE 1

The road is double-tracked between Valparaiso and Limache, a distance of 27 miles; between Ocoa and Llai Llai, 8 miles, and between Yungai and Mapocho Station, a distance of 1½ miles, making a total distance of 36½ miles of double-track line. The track is 5 ft. 6 in. gage, laid on Chilean oak ties and rock-ballasted practically the entire length of the line in the first zone. Eighty-five-pound rails are used between Llai Llai and La Cumbre and between Calera and Ocoa. The rest of the line between Valparaiso and Santiago is laid with 80-lb. rails, while the branch to Los Andes is laid with 75-lb. rails.

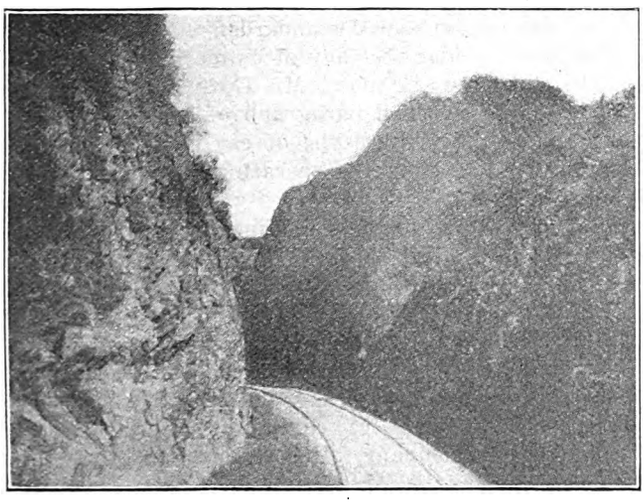


ZONE 1 OF CHILEAN STATE RAILWAYS, SHOWING TRACK TO BE ELECTRIFIED AT ONCE

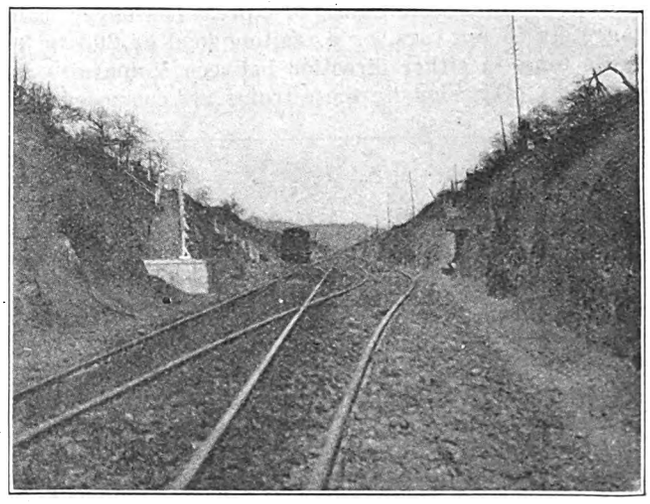
The curvature of the line as a whole may be considered as of medium severity. The maximum curves are 10 deg. and are located near Los Loros. On the eastern slope the maximum curve is 9.5 deg., located near San Ramon. The line between Batuco and Quilicura is practically level, tangent track.

The largest bridge, known as the Las Cucharas Bridge, is that over the Vina del Mar River near Valparaiso. This is a steel structure of the cantilever type, 440 ft. long, carrying two tracks. There are a number of girder-type bridges, up to 250 ft. in length.

The six tunnels on the main line are known as Los Maquis, Los Loros, Centinela, San Pedro and the two Paso Hondo tunnels, the latter being located on the double-track section. The longest is San Pedro, 1,600 ft. in length. The first three tunnels are located on the Tabon or maximum grade section between Llai Llai and La Cumbre. All the tunnels are dry except San Pedro, so that the problem of corrosion of overhead line material is not serious. The clearances from rail to roof are not such as seriously to interfere with the



DEEP ROCK CUT ON THE EAST SLOPE, NEAR SAN RAMON



AT LA CUMBRE (THE SUMMIT)

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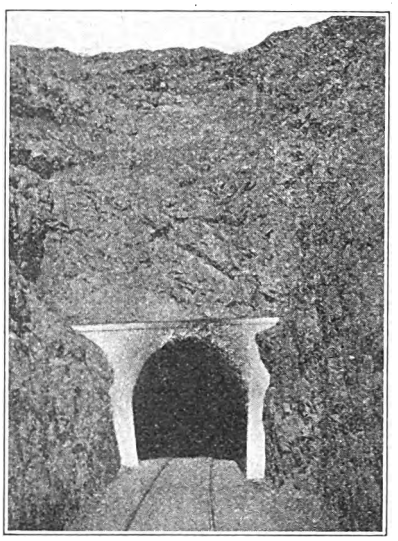
design of the overhead material or the locomotives. The grade conditions have always been an obstacle in the way of moving the traffic in the first zone advantageously. It has been necessary to maintain several helper sections to handle the freight traffic, while practically all passenger trains require helpers ascending the Tabon grade between Llai Llai and La Cumbre. With electric operation all helper service will be eliminated, except in connection with the freight trains ascending the Tabon grade. This maximum grade is 2.25 per cent, and the summit has an elevation of 2,600 ft. above the level of the sea. The maximum grade on the eastern slope is 1.81 per cent and is located near San Ramon. The elevation of Santiago is 1,800 ft. above sea level.



WEST PORTAL OF THE LOS MAQUIS TUNNEL, LOCATED ON THE TABON GRADE BETWEEN LLAI LLAI AND LA CUMBRE

The freight tonnage southbound from Valparaiso averages approximately 3,600 gross tons daily, while that passing Las Vegas in the same direction is 3,900 tons. The northbound traffic is only slightly less than that of the southbound.

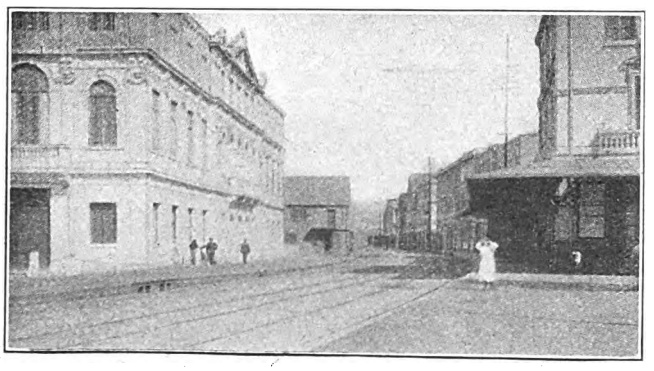
At present the freight trains going toward Santiago are made up of twenty to thirty cars each, an average trailing load of 550 tons. These trains are hauled by Mikado-type steam locomotives assisted by a Borsig Consolidation between El Salto and Pena Blanca and on the Tabon grade. In the opposite direction a helper locomotive is used between Til Til and Rungue.

With electric locomotives, 770-ton trailing loads will be hauled by one locomotive in either direction, except that in ascending the Tabon grade a second engine will be used. The trailing weights will be increased 40 per cent and the number of trains reduced approximately 28 per cent. Through freight trains that now make the one trip in ten to twelve hours will go through in six to seven hours.

Under normal conditions the express passenger trains carry six to ten cars, or a trailing load of 200 to 300 gross tons, in either direction between Valparaiso and Santiago. Occasionally these trains are composed of as many as sixteen cars, and helper engines are used on the Tabon grade. The express passenger trains are for the accommodation of first and second class passenger traffic and are the fastest trains in the service, making only a few stops in the 116-mile run. The omnibus trains, which make all stops between Valparaiso and Santiago, are always the most heavily loaded passenger trains in the service and carry cars for the accommodation of first, second and third class passengers. The electric locomotives for this service will be capable of hauling the 300-ton trains in either direction without the aid of helper engines on any section of the line.

Local passenger trains are operated between Valparaiso and Llai Llai and intermediate points. At present many of these trains carry ten cars between Valparaiso and Vina del Mar, while the engine ratings provide for a maximum of twelve cars per train. These trains are composed of first, second and third class cars, usually hauled by one locomotive, as this section of the line does not have the most severe grade conditions. The electric locomotives for this service will be required to haul trains of 260 to 350 tons on the local runs, including the 300-ton trains of the Los Andes branch.

With electric operation it is proposed to reduce the running time of the fastest passenger trains between Valparaiso and Santiago from three hours and forty minutes to three hours and fifteen minutes.



PUERTO STATION IN VALPARAISO, STATION BUILDING ON THE RIGHT

Letters to the Editors

Baltimore Officials Like the Two-Door One-Man Cars

THE UNITED RAILWAYS & ELECTRIC COMPANY
BALTIMORE, MD., Jan. 24, 1922.

To the Editors:

I have just read W. G. Gove's criticism of an article by L. H. Palmer, president of the American Electric Railway Transportation & Traffic Association, and am particularly interested in Mr. Gove's statement concerning the question of standardization.

I believe that standards are of great value; in fact, the street railway industry without standards could not make proper progress, and I do not believe, by any means, that the standard Birney car is the last word in safety car construction. Many of its details have not been carefully worked out, and certainly these faults should not be considered standards.

I do not consider that any of us mechanics are qualified to make the statement Mr. Gove does in the first two lines of the third paragraph of his letter, as the selection of the proper type of car is a decision that should be made from the operating standpoint by the operating man.

A. T. CLARK,
Superintendent Rolling Stock and Shops.

THE UNITED RAILWAYS & ELECTRIC COMPANY
BALTIMORE, MD., Jan. 24, 1922.

To the Editors:

I wish to reply to the letter dated Jan. 14, 1922, published in your Jan. 21 issue, on page 114, by W. G. Gove, superintendent of equipment of the Brooklyn Rapid Transit Company. It is evident that the subject is not yet clear in Mr. Gove's mind, and this is the reason I am commenting further.

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His statement made in the third paragraph of his letter, as follows, "The Birney standard car is without question applicable for any service in any city or any community;" cannot be substantiated nor defended. Much as we believe that the one-man car with separate exit and entrance, as in use in Baltimore and other places, is a distinct improvement over the so-called Standard Birney car, we would not by any stretch of the imagination be rash enough to apply it to the clause I have just quoted.

We are not against standardization in Baltimore, and I feel sure this applies to Chicago, but we are against standardization when it means forcing something down the throat of the industry, which is not as adequate or efficient as another design, and that apparently is what is in Mr. Gove's mind.

"The proof of the pudding is chewing the string" according to an old adage, and we cordially invite any one interested in the purchase of additional one-man cars to come to Baltimore and see the two types in operation. I am sure that one-half an hour spent in watching the operation during any rush hour period will convince any practical operating man of the justification of our position. I say this with full confidence, because several "doubting Thomases" have already been convinced by this method. Here and now, I extend an urgent invitation to my good friend Gove to jump on a train for Baltimore and come down and be convinced.

Far from blocking the wheels of progress, we are trying to improve conditions, and we suggest to our friends in the industry, if they are still doubtful about this question, that they come down and let us show them. It would be a great pleasure for any of us to take enough time thoroughly to demonstrate to Mr. Gove and any one else, just why the newer design is so superior to the old one.

L. H. PALMER,
Assistant to President.

Transfers Show Point of Origin

BIRMINGHAM RAILWAY, LIGHT & POWER COMPANY
BIRMINGHAM, ALA., Jan. 15, 1922.

To the Editors:

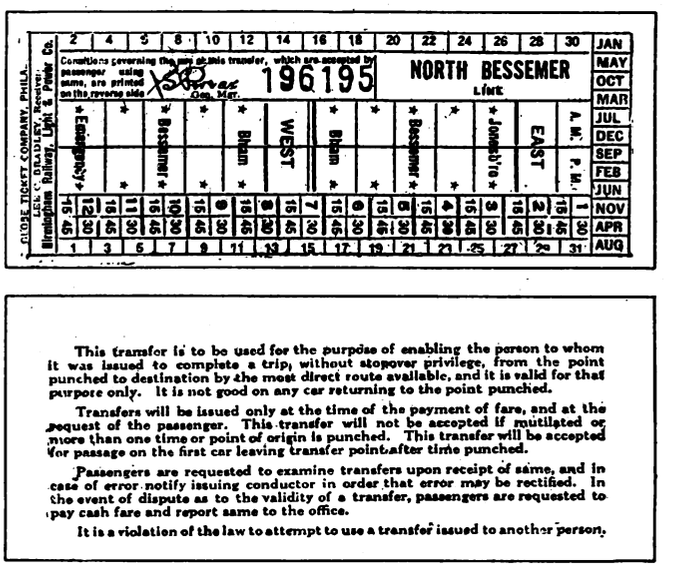
I read with interest the editorial appearing in your issue of Dec. 31 relative to the issuance and use of transfers, and I suppose your conclusion regarding railway properties is that each is quite similar to a mother with her children. Each one thinks that her own are paragons of excellence, so I cannot refrain from calling your attention to the transfer in use on this company's property.

The prevailing idea that seems to exist with railway properties is to restrict a passenger to a specific line and at a specific point when a transfer is made, with the result that transfers as a rule are so complicated in showing on the face on just what line they are valid that the conductors themselves get confused, make numerous errors and provoke unfavorable criticism of the whole transfer system.

Our policy in Birmingham is that we are not particularly interested in just what line a man uses a transfer on, so he does not make a round trip for one fare. We have therefore adopted a transfer which indicates on the face of it the point at which, or points between which, the passenger boards the car. The transfer is then punched fifteen minutes after the arriving time of the car at its terminal, which is usually the central business district, and the transfer is then good up to and including the first car passing a transfer point after the time punched, provided it does not take the passenger back in the direction from which he came.

The station master punches the month with a triangular punch when the transfer is issued. The conductor then punches the date, the time and the point of origin on the transfer.

By the use of this transfer, conductors on regular runs are usually familiar with the approximate number of passengers they will receive requesting transfers at



FRONT AND BACK OF BIRMINGHAM TRANSFER

principal loading points, and at their leisure in approaching these points they are able to punch the point of origin and the time, so that there is no confusion and less opportunity for errors than in attempting to punch a dozen different destinations on a transfer when passengers are boarding in large numbers and each passenger is asking for a different destination.

We have a charge of 2 cents for a transfer, and this necessarily reduces the number issued to the passengers who actually desire to continue their journey on another car, and the misuse and abuse of transfers is minimized materially, as there is very little disposition on the part of passengers to purchase transfers and give them away or exchange them. For instance: During November, 1920, this company lifted 938,711 transfers. During November, 1921, we sold 542,486 transfers, which indicates the disinclination of passengers to obtain transfers unless they actually desire to use them.

I am inclosing a sample of the transfer mentioned, thinking that it might prove interesting, since the subject has been discussed.

No doubt local conditions govern to a large extent the character of transfer used, but wherever it is possible, local conditions permitting, to use a transfer such as is in use here, I believe errors by issuing conductors and misuse of transfers would be reduced materially.

We use a different color of transfer for each line, and with the month and date being punched out by the station master and the conductor, we are enabled to effect a very considerable saving over the practice of printing the date in large figures on the face of the transfer.

T. G. BRABSTON,
Superintendent of Transportation.

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New York State Men Wide Awake

Discussion at New York City Meeting on Jan. 24 Showed Keen Interest in Reducing Platform Labor Cost, Insuring Reasonable Conditions in Regard to Compensation Claims and Promoting Relations of Mutual Value Between Cities and Railways

AT THE twenty-fifth midwinter meeting of the New York Electric Railway Association, held at the Astor Hotel on Jan. 24, three principal subjects were discussed: One-man car operation with double-truck cars; workmen's compensation claims as a continuing and increasing liability to railway companies, and one year's experience with the cost-of-service plan in the city of Rochester, N. Y. These topics were carried in papers prepared respectively by H. S. Sweet, engineer of equipment New York State Railways, Syracuse; Martin E. Burke, assistant general attorney Interborough Rapid Transit, New York City, and Charles R. Barnes, Commissioner of Railways, city of Rochester. Abstracts of the three papers appear elsewhere in this issue.

President W. O. Wood, New York & Queens County Railway, presided at the morning and afternoon sessions and at an informal dinner in the evening. About 200 men were in attendance.

One-Man Double-Truck Car with Turnstile

The program opened with Mr. Sweet's paper, which he read. He then showed lantern slides made from photographs and drawings to illustrate the paper. This discussion was opened by W. H. Collins, Gloversville, who reported using a few one-man, double-truck cars. He considered the turnstile plan described by Mr. Sweet to be promising. W. J. Harvie, Auburn, stated that his company operates one-man cars satisfactorily with entrance and exit at the front. He asked as to the saving in duration of stop which results from the turnstile plan, and called attention to the effect of bad weather. Mr. Sweet replied that with light traffic and seated load there is little saving, but in rush-hour and other heavy traffic the stop is reduced from 20 to 25 per cent. Stating that in Auburn the boarding and alighting accidents with one-man cars are negligible, Mr. Harvie asked regarding this feature with the new cars, and especially as to the effect of two doors being open at once. Mr. Sweet replied that careful investigation had shown the turnstile cars to be slightly safer than others. He attributed the smaller number of collisions with vehicles to the fact that the car is at rest when fares are being collected. There was no trouble due to the opening of the front and rear doors simultaneously.

President Wood suggested that the new plan has been in use but a few months. It will require a year's experience before a definite conclusion regarding it can be reached. Mr. Sweet pointed out, however, that the turnstile cars had come through the Christmas rush successfully, in Syracuse and Utica, with a satisfactory accident record. Further, as to schedules, the timetable department finds these to be well maintained. B. E. Tilton, Syracuse, said that after three months, one-man operation had reduced boarding accidents 65 per cent and alighting accidents 45 per cent. Records were made on a car-mile basis, although passengers handled might be a better basis.

The Turnstile Car an Evidence of Salesmanship

In reply to a number of questions Mr. Sweet stated first that there is no trouble in fare collection, the inspection plate in the fare box being brightly illuminated. Again, the turnstile normally permits only entrance but can be unlatched to let passengers out in emergency. Finally, the public likes the turnstile plan.

A. J. Manson, Westinghouse Electric & Manufacturing Company, expressed appreciation of the new car plan as an evidence of transportation salesmanship. This device improves service and suggests that in "doing something different" the railways advertise their service.

C. H. Beck, Westinghouse Traction Brake Company, said it is interesting to hear the one-man car referred to in the past tense, which indicates the progress made recently. As to the double truck, one-man cars, the proponents of the Birney car had no idea of flooding the country with single-truck cars to the exclusion of the larger ones. The railways must operate these large cars, but the Birneys must be credited with establishing the practice of one-man operation. Once established, this practice can now be extended until practically all cars are so operated.

Single-Truck Has Wide Field

Mr. Beck called attention to the general characteristics of city travel which are favorable to the small car and which involve picking up a load and delivering it at different points, although the operation of some lines involves loading and unloading simultaneously. In Baltimore there is a "crescent" cross-connecting line of this sort on which the safety car has stood the "acid test."

H. W. Blake, ELECTRIC RAILWAY JOURNAL, asked Mr. Sweet these questions: (1) What would be the effect of the new plan on short-haul passengers, due to their having to force their way through the car? (2) How does the turnstile car compare with the two-door safety car? Mr. Sweet replied that with any near-side car the front is crowded in rush hours. The short-haul rider like others has difficulty in boarding. This is more serious than his being forced to crowd his way from rear to front.

Asked by Mr. Wood as to the sacrifice of seating capacity due to the turnstile, Mr. Sweet said that while some seating capacity is lost with the Peter Witt cars, the standing capacity is increased. With the rear-entrance cars some standing room is used but with other one-man cars the rear platforms are not usually filled anyway. He also answered F. A. Stratton, Mount Vernon, who asked as to odd-coin fares in relation to the new plan, by saying that there is no trouble in collecting the 6-cent fare in Syracuse and the 8-cent fare in Utica. Locked boxes are used.

One-Man Cars in Brooklyn

C. E. Morgan, Brooklyn, said that the Brooklyn Rapid Transit Company operates 256 one-man cars of which 206 are standard Birneys. The others are double-truck cars with safety features. Experience with these has taught the importance of fitting the type of car to the service. There is a limit beyond which the single-truck car cannot go, and a larger car is demanded. Further, it may be necessary to employ two men in the rush hour on cars otherwise one-man operated.

In all of this the type of car whatever it is must first be "sold" to the employees and through them to the public if it is to be applied successfully.

Overlapping Zones with One-Man Operation

A. V. Louer, Albany, started the discussion on a new tack by asking about the collection of fares on one-man cars in overlapping zones. His company is equipping double-truck cars for one-man operation, but finds little information on this phase. He makes two collections and finds that 80 per cent of the traffic originates in the overlap. It is necessary to identify passengers as they board.

Mr. Collins said that he has a somewhat similar problem on a line running in two adjoining cities, where an 8-cent fare is collected in one city and a 12-cent fare in the overlap. The two fares are collected at entrance, and a double register is used. At first a surrender slip was used but it was found to be unnecessary as the operator could check his load at the edge of the first zone.

Mr. Beck cited an overlap zone situation in Philadelphia, in which

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identification checks were passed out as the car entered the second zone. Mr. Stratton said that on his property the car is stopped at the edge of the zone for the collection of fares. Mr. Wood said that his case is similar to those mentioned but with the additional legal complication that the fare be all collected at one time.

One-Man Cars in New York

R. E. McDougall, New York City, next reported as to the use of one-man double-truck cars on the New York & Harlem Railroad traction lines. In July, 1920, one-man operation was started on the 86th Street Crosstown line, 1.1 miles long. Thirty-five-foot cars are used, eighteen being required in rush hours, ten at other times. The operation is satisfactory and the passengers and men like it. After a year the plan was extended to the Madison Avenue line and is now used for night service and for partial Sunday and holiday service. What is needed next is a turnstile type of double-end car. This, Mr. Sweet said, will be put out soon on the New York State Railways lines.

J. W. Welsh, American Electric Railway Association, pointed out that there are three passageways on the standard type of double-truck car. Does the new car, he asked, cut out one of these? Mr. Wood said that passengers do not always use all of the passageways available to them; and Mr. Sweet added that the front doorway on the turnstile cars can be used for entrance if necessary.

Asked as to why three-quarters of a minute per mile is added to the schedule with one-man operation B. E. Tilton said that this (which is an average and not a maximum allowance) is not allowed on all lines and may later be cut out. It was largely put in by the company because of the newness of the service.

Afternoon Session

After a buffet luncheon, which was served in an adjoining room of the hotel for those in attendance, the discussion on the use of double-truck cars for one-man operation was continued.

J. K. Punderford, vice-president and general manager the Connecticut Company, told of its operation of cars by one man. The company's present service includes 132 Birney cars and forty-five converted one-man cars. In addition to these, all the double-truck cars in Bridgeport are now operated with one man. As the time afforded for changing to one-man operation was very short, these cars were not equipped with full safety devices. Mr. Punderford also told about a method of collecting fares on a four-zone one-man bus line operated by a company between New Haven and Devon. The fare per zone is 10 cents. The first two zones are operated pay-enter and pay-leave. Passengers entering the bus in the third zone receive a blue check and those leaving the bus in the third zone must deposit in the fare box either a blue check and 10 cents or 20 cents in cash. Those that enter the bus in the fourth zone receive a red check and those that leave the bus in the fourth zone must deposit either a red check and 10 cents or a blue check and 20 cents or 30 cents in cash. Mr. Punderford also commented on the turnstile arrangement as described by Mr. Sweet and suggested that a pair of flappers might be used which would permit entrance but prevent passage in the opposite direction, and on double-end cars these could be hooked back when not in use so as to give a free passage.

A. E. Reynolds, general manager United Traction Company, Albany, N. Y., described the use of one-man cars on his road. The big problem which they have had to solve since the strike has been the breaking in and training of green men. The use of one-man operation has resulted in a slowing up of service to some extent, and the length of lay-over at the end of the lines has been extended in order to permit the men to make out their reports, which require extra time.

Ernest Murphy, assistant general manager United Traction Company, Albany, N. Y., told of the work of the mechanical department necessary for the converting of the company's cars to one-man operation. This work was also made somewhat difficult due to the use of men who were unfamiliar with car equipment. At present they are operating eleven safety cars and eighty-eight remodeled cars. Of this latter number thirty-seven are single-truck cars and the remainder double-truck cars. A new feature is the use of the rear door, which is controlled by the operator at the front end. This control is effected at the air brake valve in a similar manner to that used on Birney cars, and in order to provide for individual operation of the rear door or the front door or a combined operation of the two doors a selector valve has been added to the equipment. This valve is placed in the rear door position when operation of the rear door is necessary, and then the control is effected from the air brake valve in the usual manner. Where it is necessary to operate the front door, the selector valve is placed in the front door position and operation of this is controlled from the air brake valve. When both doors are to be operated, the selector valve is placed in the central position and operation is effected in a similar manner.

Workingmen's Compensation Claims

The discussion on this subject was initiated by a paper by Martin E. Burke, assistant general attorney Interborough Rapid Transit Company, New York. An abstract of this paper will be found elsewhere in this issue.

The first delegate to discuss this paper was R. J. Messenger, claim agent Rochester & Syracuse Railroad, who said that company followed the principle of self-insurance. Through an accident-prevention campaign which had been conducted the seriousness of the accidents had been decreased, though strictly speaking the number had increased because now reports are made on every accident, no matter how slight, in the shops.

Charles R. Morrison, vice-president and general manager Utilities Mutual Insurance Company, New York, said that the cost of insurance compensation was increasing, as New York had the most burdensome compensation law in the country, but it was having the effect of making employers more careful. He believed that all companies should organize and get the public to organize to reduce accidents. While self-insurance could safely be used by large companies, a number of large companies had joined his insurance organization, so as to assist in giving it stability and to make it more desirable for the smaller companies. An advantage in mutual insurance was that it brought to each member the experience of all of the companies in accident reduction.

B. E. Tilton, vice-president and general manager New York State Railways, Syracuse, said he was a strong believer in safety campaigns.

W. H. Collins, general manager Fonda, Johnstown & Gloversville Railway, said that company carried part of its own liability insurance and also carried part in the Utilities Mutual, and had got great help from the inspectors of that company. He mentioned a case where a trainman had made a claim for a dislocated knee. After about nine months, during which the company had paid between $800 and $900 for this injury, it had been discovered that the trouble complained of had been experienced by the trainman several times before and while on the invalid list similar trouble developed in the other knee. The conclusion reached was that the trouble was due to a disease and compensation was stopped, but the writer was uncertain whether the company had any redress.

R. R. Hadsell, superintendent of transportation of city lines, Rochester, said that company had inaugurated on Jan. 1, 1922, a safety campaign in which a feature was a campaign to reduce carelessness by automobile drivers. Committees were organized among the trainmen and violations of rules of the road observed on the part of automobilists were reported to a central officer, who either communicated the information to the city officials or sometimes, if the offender was a truck driver, made a direct complaint to the owner of the truck. The method had proved most efficacious, not only in reducing such acts of carelessness, but in interesting the railway trainmen in accident reduction.

Discussion on Mr. Barnes' Paper

In the discussion on service at cost in Rochester J. K. Choate commented on the valuable work done by Mr. Barnes while with the Public Service Commission of New York and said that he considered that Rochester was particularly fortunate in having the services of such

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an efficient man in helping to solve its transportation problems.

THE BANQUET

One hundred and sixty-eight railway and supply men attended the dinner in the evening. The speakers were Fred S. Purnell, Congressman from Indiana, and Edward J. Rice of New York. Mr. Purnell's subject was "The Turn of the Tide in American Problems Today." Mr. Rice's subject was "What the World Needs—More Humor." In this particular instance the usual order was reversed in that the serious speaker came from Indiana while the fun was furnished by the gentleman from New York.

Mr. Purnell did lighten up his talk with well-chosen humorous illustrations, but for the most part his plea was that the only "isms" which should be tolerated in America were Americanism and patriotism. His introduction to the diners by Toastmaster William O. Wood was with one exception the shortest in his career, Mr. Purnell said.

The speaker asked that the diners try occasionally to picture themselves in the place of their representatives in Washington. Recently one of Mr. Purnell's constituents had written him asking him to try to reduce taxes, increase wages, lower the tariff and find a loophole in prohibition. Many different interpretations were put on the same thing in different parts of the country. Thus he learned on a recent tour of investigation that to the farmer of Maryland the corn crop there meant something entirely different from the 200 gallons to the acre interpretation of the Kentucky farmer. Mr. Purnell thought that the problems of reconstruction were infinitely greater than those of the war. A rebellious spirit was rampant in the country. This spirit was dormant in some, but outspoken in others. He said that two things were needed at this time: First, a definite program for looking after the needs of the workingman. Second, a plan to help every workingman to own his own home.

Mr. Rice told one good story after another. A story of his especially pleasing to the railway men was one about a Jewish crew, recently hired and assigned to a dull run on the Spring Street line where the receipts were only a few dollars for the first day; they got disgusted the second day out and ran the car on Broadway, with returns so large as to attract the superintendent's attention.

One-Man Car Operation with Double-Truck Cars*

Seventy-Five Cars Have Been Equipped with a Turnstile to Admit Passengers Who Pay as They Leave

BY H. S. SWEET
Engineer of Equipment, New York State Railways

IN THE spring of 1921 it was decided to try one-man car operation on several of our heavy carrying lines in the city of Utica. Our previous experiences with hand-brake, single-truck, one-man cars on a couple of shuttle lines and in the cities of Rome and Oneida had made us anxious to extend this type of service.

During the greater part of the day the schedule on the lines in Utica on which we contemplated trying out the one-man cars had as short a headway as was practical with the existing single track and location of switches. This made it desirable to use a one-man car as large as those which we were already operating with two men. The cars which were running on these lines were of two types: the double-truck Peter Witt cars, weighing 32,000 lb., and a few of the rear-entrance front-exit older pay-as-you-enter cars, weighing approximately 45,000 lb. The only changes made were to move the fare box and relocate some stanchions. The results obtained from these cars with one man showed that it was perfectly feasible to operate a double-truck car with one man and that the thing to decide in the future extension of our one-man car operation was the ultimate economic difference between buying the so-called safety cars or using our existing double-truck equipment.

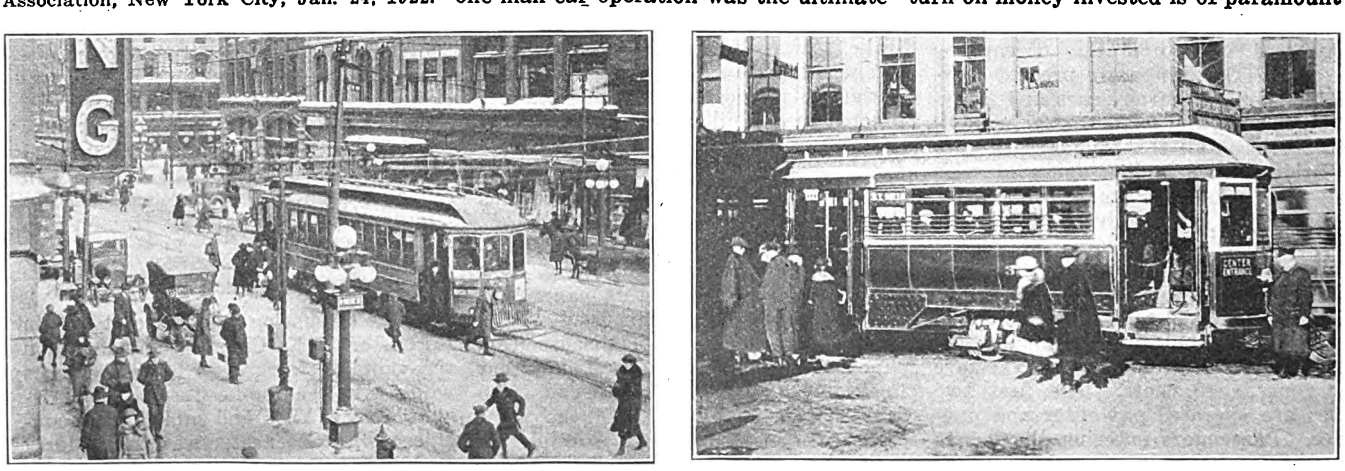
"There is much to be said on both sides," to use the old-time expression, and the decision must depend on the relative weights given to the advantages and disadvantages of the different kinds of equipment. The relative weights will vary greatly according to the conditions under which the cars are to be operated, and which will hold in one city will not necessarily be true in another. In fact, while some lines might indicate advantages by use of one-man double-truck cars, other lines in the same city could be operated more economically with single-truck one-man cars.

In this problem, the maintenance per car-mile and the power consumption per car-mile should receive proper relative value, as a car seating thirty-two passengers and carrying fifty-five to sixty during rush hours should not be compared on a direct car-mile basis with a car seating forty-five to fifty-four passengers and carrying from 115 to 125 during rush hours. As it is necessary for any company to have enough car carrying space to handle the peaks of traffic, the lower power consumption and supposedly lower maintenance per car-mile of the single-truck car is offset, if not overshadowed, in the total maintenance account by the fact that if larger cars are used, fewer are required to handle the traffic.

The question of the maximum number of cars it is necessary to operate is a very important factor as it has a direct bearing not only on maintenance, size of shops, accidents and power consumption, but also on platform time, money invested and congestion in the streets. It should also be remembered that to give the same riding qualities, the single-truck car requires a much higher degree of track maintenance than the double-truck car, which means that some track might require the expenditure of a considerable sum before it would be suitable for single-truck cars.

In making a survey of the advisability of either single-truck or double-truck one-man operation, one must not lose sight of the fact that the net return on money invested is of paramount

*Abstract of paper read at midwinter meeting of the New York Electric Railway Association, New York City, Jan. 24, 1922.



TURNSTILES APPLIED TO TWO TYPES OF ONE-MAN CARS IN SYRACUSE

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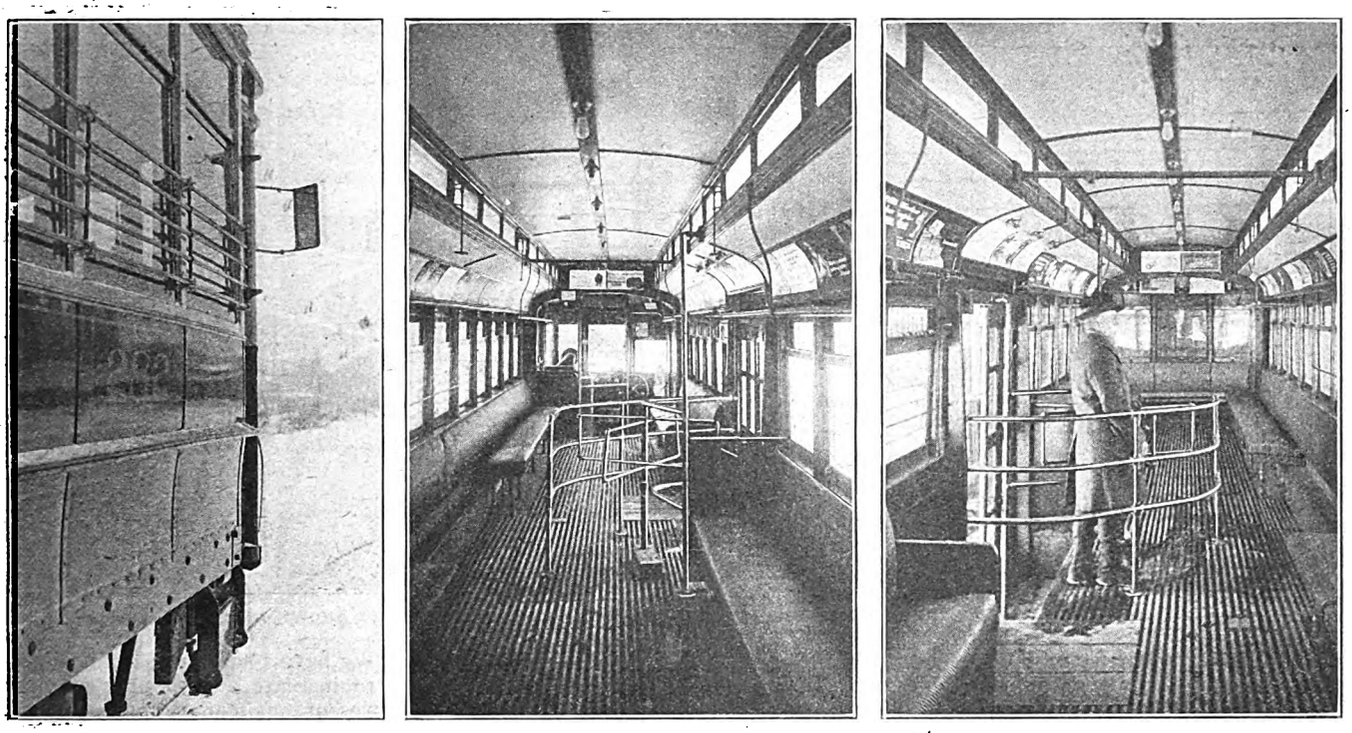


VIEW AT THE LEFT SHOWS THE MOTORMAN'S MIRROR. VIEWS IN CENTER AND AT RIGHT SHOW TURNSTILE APPLIED TO PETER WITT CAR

importance and the comparative cost of operating, maintaining, etc., different types of cars on the system is only secondary and, when taken separately, should have no real weight in the decision. Of course, if the company has not enough equipment and has to purchase some extra cars, a balancing of these various factors might show that it would be advisable to get the single-truck car under some operating conditions.

As we intended to try out one-man operation in Syracuse and extend this type of service in Utica, we investigated the single-truck and double-truck car one-man operation from the angles mentioned above and others, not forgetting the possibilities of increased riding which would result from any increase of service that it would be possible to give with the single-truck car.

As a result we decided to use the double-truck cars. It was practically mandatory in Syracuse, as the speed of cars during rush hours is considerably slowed down by the number of cars and other vehicles on the street, and to have used a sufficient number of single-truck cars to handle this rush-hour traffic would have increased the congestion materially. Even if we had been able to disregard the question of congestion we would have reached this same decision on account of the greater economic benefit to be derived from double-truck operation.

TURNSTILES REDUCE CONGESTION AT FRONT END

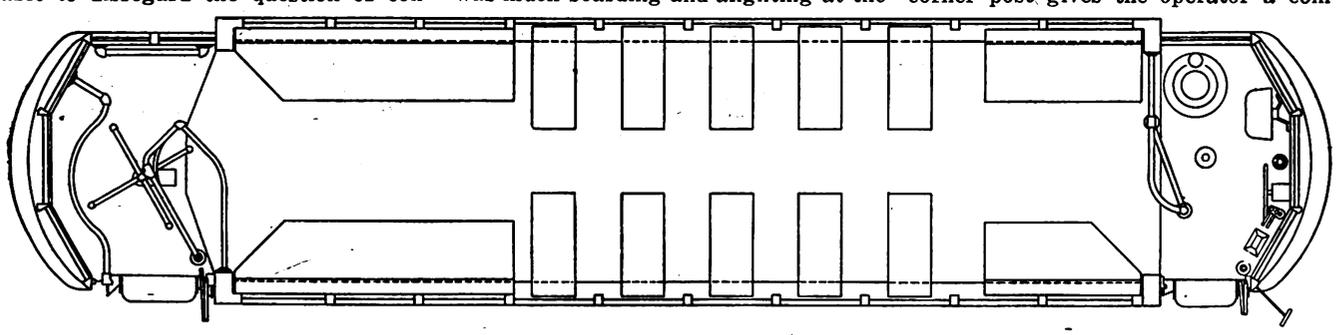
With the extensive introduction of one-man double-truck cars we found what we had already anticipated to a certain extent, namely, that the congestion of boarding and alighting passengers who were forced to use the same door for both entrance and exit slowed down the service. This, of course, is true on the single-truck Birney car, only to a lesser degree, as the car does not carry as many people. One cannot but notice this upon looking at some of the photographs which advertise the Birney car.

From the previous experience that the railroads have had with the near-side car, this congestion and unwillingness of passengers after entering to go to the rear was to be expected, for either double or single-truck one-man cars which have entrance and exit on the same end are fundamentally near-side cars.

On cars with narrow front vestibules, which operated on a line where there was much boarding and alighting at the same time, this delay was a serious matter both to the schedule and the convenience of the public, especially during inclement weather. On cars with a wide front vestibule and double doors, the delay was considerably less but it was still a source of much annoyance. To remedy this trouble we tried remodeling different types of cars.

On the lines which operated cars with large front door openings and not many points where simultaneous boarding and alighting occurred, the rear or the center doors, as the case may be, were put under the control of the operator so that he could use them during rush-hour periods at points where an inspector was stationed. This helped considerably, and we are operating more than eighty cars thus equipped.

On the crosstown lines where single-end cars with narrow front vestibules are operated and where there was considerable simultaneous boarding and alighting, we operated the car on the pay-as-you-leave principle with the rear door, which was placed under control of the operator, used for entrance of all passengers. A turnstile was located at the rear entrance to allow passage in the entrance direction only. A mirror projecting from the front vestibule corner post gives the operator a com-



PLAN SHOWING TURNSTILE APPLIED TO END ENTRANCE AND EXIT CAR

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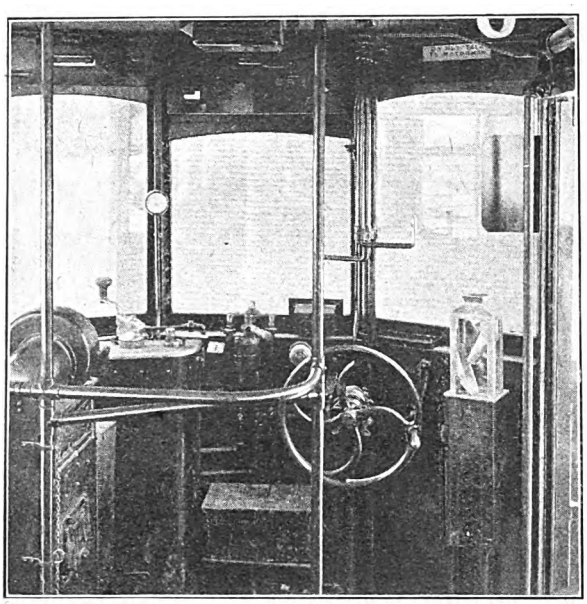
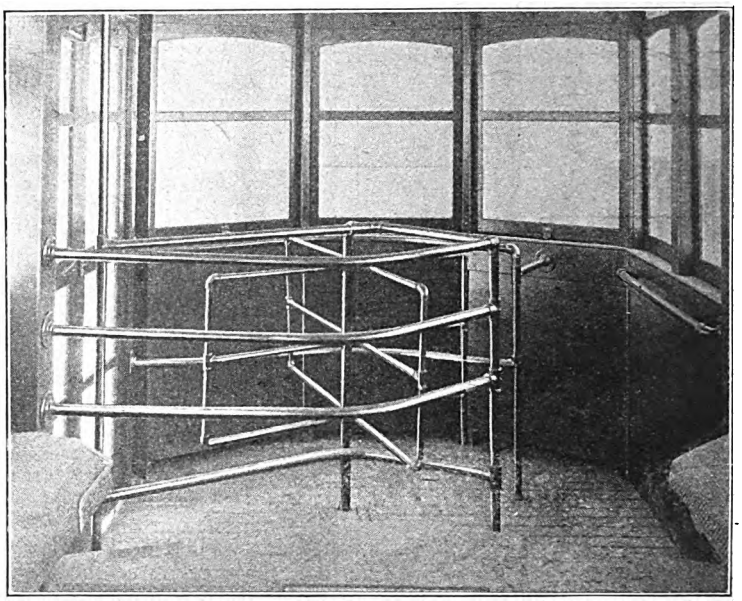




FRONT AND REAR ENDS OF DOUBLE-END CAR—REAR DOORS ARE OPERATED BY HANDLES SHOWN IN FIRST VIEW

plete view of the outside of the car and rear step both day and night, for at night a bank of lamps placed over the rear step is arranged to light automatically with the opening of the rear door. After considerable experimenting as to the exact location and design of the turnstile, arrangement of the mirror, etc., we completely equipped one crosstown line in Syracuse in August, 1921.

At any time, but particularly during the rush hours, it is almost impossible to induce passengers to fill up the rear of the front entrance and exit type of car. The turnstile rear-entrance type automatically took care of this load distribution as the passengers knew that they would have to leave by the front door and therefore moved forward. It was soon apparent that this type of car could carry the public with less congestion at the doors and far better distribution of load than our other one-man cars.

We then rapidly increased our one-man turnstile cars until today we are operating with this type three lines, or about forty-five cars in Syracuse and all the crosstown lines (or thirty cars) in Utica. We are also experimenting with equipping the Peter Witt and double-end cars with turnstiles and have had such good success with the Peter Witt cars equipped with turnstile at the center door that we are going to equip many more in the near future. The double-end car does not as readily lend itself to the turnstile and we have not yet operated any thus equipped.

If the operating company decides to use safety features, the double-truck one-man car lends itself readily to any type of safety feature used in single-truck cars.

In fact, we are operating in Syracuse on some of our one-man cars the so-called "dead-man" control and other safety features, somewhat similar to the standard Birney car only they give more protection in various ways. On the turnstile type of car the turnstile is freed automatically during an application of emergency brakes, thus allowing the rear or center door to be used as an exit.

DOUBLE-TRUCK ONE-MAN CARS SATISFACTORY

From our experience in double-truck one-man operation, we believe that in its present form it opens up great possibilities for economies in the operation of cars in large cities and heavy traffic, and that any railroad company which contemplates one-man car operation should make a careful investigation before deciding whether it is going to operate with single or double-truck equipment. If a company must purchase new equipment, it should be sure to get the proper kind of car for the service desired, and in many cases the double-truck one-man car will prove to be the most economical when everything is considered at its proper value.

In conclusion, I might say something regarding the difference in running time with one man or two men operating the same general size of double-truck car. We have found it was only necessary to increase our running time on our present one-man car a maximum of three-quarters of a minute a mile over two-man operation, and this increase is during rush hours only and not on all lines. It should also be remembered that double-truck one-man operation is in its infancy and that with further education of the public and development of change and transfer-issuing machines, the car will undoubtedly be as fast, if not faster, than the older cars of the two-man pay-as-you-enter type.

Service-at-Cost in Rochester*

Advantages of Continuous Over Intermittent Supervision—One Year's Experience with Plan Successful

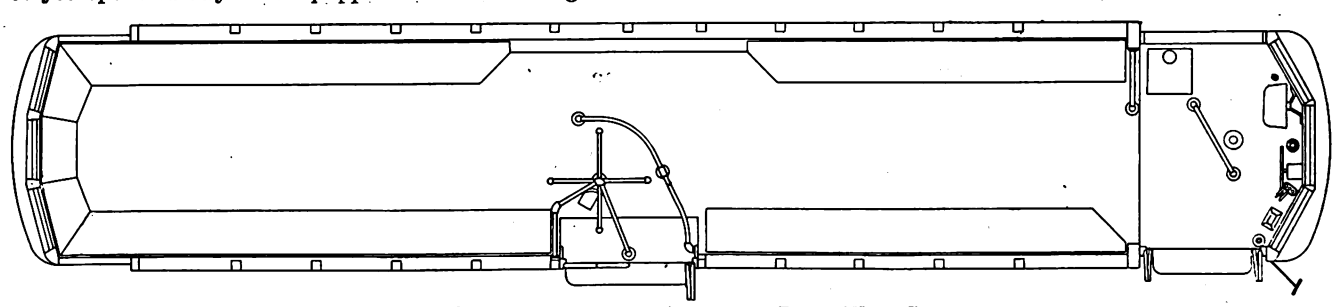
BY C. R. BARNES

Commissioner of Railways in City of Rochester and formerly head of electric railway division, Public Service Commission, State of New York, Second District.

"HEY, BILL! We must be sure and flag the steam crossing today, as there is a public service commissioner in town."

This instructive information was given by a conductor from the tail end to his motorman on the front end of a car on which I was the only passenger. At the time I was chief of the electric railway division of the Public Service Commission. Upon my arrival in the city, an hour before this took place, I

*Paper presented at midwinter meeting of New York Electric Railway Association, New York, Jan. 24, 1922.



PLAN SHOWING TURNSTILE APPLIED TO PETER WITT CAR

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had called up the general manager and told him I had come to make an inspection of his road. This information had evidently filtered through to the car crews.

"Train 1004 was three minutes late last night, causing a hole of six minutes, resulting in two packed cars on the Park Avenue line. What was the cause and what will be done to prevent a recurrence?"

These remarks were made by the Commissioner of Railways to a representative of the operating department of the New York State Railways in the commissioner's office at one of the conferences which are held daily with the operating department for the purpose of analyzing the service of the day before. The basis of the remarks was the check of the service which is made daily during the morning and evening rush hours on all of the lines in the city of Rochester.

These two typify the practical results of intermittent and periodical state regulation of service on electric railways, as compared with the detailed, thorough and continuous supervision of service made possible under service-at-cost operation. Under the latter, the amount and character of the service are subjects of every day observation and control by the commissioner and his assistant. Under the former, it is not practicable for the State to employ the number of people necessary continuously to check service on all of the electric railways in the State. My experience, covering a period of twenty-five years, in this work stresses the fact that the railway manager is human and is governed by the same instincts which cause the district school teacher to dress up the school for the visit of the trustees.

For this reason, no matter how serious the complaint against service may be, on inspection by the public service commission, in some cases it is found to be adequate and satisfactory. Under service-at-cost operation the manager is deprived of this prerogative and must be on the level at all times as his service is under continuous scrutiny.

Results of Franchise and Causes for Its Adoption

In Rochester the New York State Railways' lines, city and suburban, have been operated since August, 1920, under a service-at-cost contract, the terms of which have been given wide publicity. They include a varying rate of cash fare from 3 to 10 cents, with a reduced ticket fare in each case. The fare to be charged is contingent upon the net revenue, the company receiving a return based upon physical valuation and inversely affected by the rate of fare. The operation up to the present has been under a 7-cent cash and a 6½-cent ticket fare. The return to the company at this rate of fare is 6 per cent. The gross revenue for the year ended July 21, 1921, was $5,009,295.91. After deductions provided for in the contract, which includes the return to the company on the appraised value of the property, there was a deficit of $133,998.48 for the year. Operations since Aug. 1, 1921, indicate that the present year will show an improved financial condition.

Rochester is known in street railway circles as the home of the "Quinby Case." In this case the courts held the limiting 5-cent clause in the franchise to be valid. These court decisions were reached after a legal battle between the city and the company extending over several years. The natural outcome of this controversy was an extended public sentiment against the corporation. This was aggravated by the fact that under a 5-cent fare the company was obliged to curtail its service beyond the requirements of comfort and convenience.

The service-at-cost contract was the result of a "get together" effort on the part of the city and the company. The success of this plan of operation in the city of Rochester can be judged by the fact that prior to the execution of this contract the press of Rochester, both editorially and locally, contained daily criticism of the company and the service furnished by it. The files of the Public Service Commission also were filled with complaints in regard to it. As indicating a change in public sentiment, when the contract became effective, the increase in fare from 5 to 7 cents was accepted without general protest. That operation under the contract is satisfactory to the people of the city generally is shown by favorable newspaper comment, by expressions of city officials, numerous private citizens and civic associations.

A year and a half of operation has convinced me that the service-at-cost plan, as applied to the city of Rochester, is beneficial and equitable, both to the riders and the company. It is especially beneficial to the company during periods of business depression, guaranteeing it a stated return on investment. It is of advantage to the riders during times of normal business and boom conditions, as during these periods it prevents the company from exploiting to the limit a fruitful field of revenue. In other words, it stabilizes the amount street car riders shall pay and the amount the company shall receive. Further, it insures to car patrons the service for which they pay.

I feel that the service-at-cost contract in the city of Rochester has been a complete success and has fulfilled every anticipation of the people, the city and the company. This has been largely due to the splendid co-operation that has existed between the railway commissioner and the company, which has resulted in a service unequaled in any city with which I am familiar.

Workmen's Compensation Claims*

Considered as a Continuing and Increasing Liability to Electric Railway Companies—The Greatest Care Should Be Exercised in the Selection of New Employees.

By M. E. Burke
Assistant General Attorney,
Interborough Rapid Transit Company, New York

WORKMEN'S compensation was investigated by a commission of the American Federation of Labor, the National Civic Federation, and by many other commissions and persons in this country and abroad. The workmen's compensation law of 1914 in New York State was drafted from scientific information gained from such investigations. It was and is the most liberal and humane law of its kind in the world. It would be supposed that a law enacted under such circumstances would stand until time and conditions required a change to be made. But we find that each and every year the law has been attacked, not by experts who understand its relation to industry and the principles upon which compensation is founded, but by solons who go to Albany for the first time and who believe they see in the compensation law a means of gaining favor with some petty labor organization. Their attack consists in increasing each and every burden imposed by the law.

The principle upon which industrial accidents were to be charged to the costs of production was that the burden on the community would be less than it was when adequate provision was made through public and private charity for taking care of injured workmen and their dependents. In theory the law was to do away with the necessity of extending charity by the community to those unable to work because of an accidental injury. The basis for the compensation was the charity that was generally extended in such cases. On such a basis, workmen would not extend their disability voluntarily. This theory, which was considered necessary to make the principle workable, no longer governs our Legislature. The one purpose now seems to be to increase the compensation to a point where the employee will get the same sum whether he works or remains idle; to do away with the waiting period so that weekly vacations can be taken with pay; to give to the employee his own doctor so that there will be no check by the employer when he does remain away.

The difficulty with the present theory is that all men are not honest; that most men work because they need the money; if they can get it without working, they ask, why work? If it were not for the wiser heads in the Legislature, who do their greatest work in

*Abstract of paper read at midwinter meeting of the New York Electric Railway Association, New York City, Jan. 24, 1922.

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killing vicious bills, organized labor would retire on compensation, or industry would become bankrupt. Although the law is perfectly understood at present because of the decisions rendered in the last seven years, and although it stands supreme in the bestowing of benefits, yet, this year, we find the same bills with the same purpose in view. The schedules are increased about 30 per cent. The awards under the schedules are no longer exclusive. Double compensation for the disability period is allowed, which means generally $40 per week. The deaf are to be compensated, which opens the door to stupendous frauds in this catarrhal climate. Many other changes are suggested, but it is unlikely that they will ever become the law in the present Legislature. It is hard to understand why supposedly intelligent men should think that compensation costs should be increased, when wages and all other commodities are on the decline, unless we decide that it is done for political advantage.

The theory that industrial accidents should be charged to the cost of production does not work well when applied to common carriers who have their rates fixed by bodies over which they have no control, particularly when such bodies insist on keeping the rate at 5 cents regardless of the actual cost of transportation.

The constitutionality of workmen's compensation has been settled by the highest court. The law is here to stay. There is only one way to avoid all the burdens of compensation and that is to avoid the accident in the first instance. Consider the question in a twofold sense, compensation and prevention.

The New York act permits the burden of compensation to be carried in four different ways; the best is self-insurance. Under self-insurance you pay exactly what accidents cost under the law. The avoidance of accidents will relieve you from payments.

Accident Prevention Work Needed

Accident prevention of every kind brings its reward, not only in reducing human suffering but in decreasing costs for the carrier. The nearer perfection the equipment of the plant for the avoidance of accidents is, the less will be the cost of compensation. A strict compliance with the law regulating shops and factories will obviate accidents from antiquated and unguarded machinery.

Accident prevention is not an experiment. Practically every one knows today of the common methods used to prevent accidents. But, because they are known, they should not be discarded on the principle that familiarity breeds contempt. The placards containing the numerous "Don'ts," "Safety First," cards, lectures, inspectors who inspect, welfare workers, all have their place in this crusade. After the accident the first-aid man with the first-aid kit in readiness, the company doctors, company nurses, proper hospital arrangements, are all necessary.

Granting that all this is done there is still something of vital importance which should receive attention. If it has ever been your experience to attend at one of the several hearing rooms in New York, where compensation awards are made, you must have been impressed with the low degree of intelligence possessed by the applicants for compensation. It would seem to demonstrate that employees who injure themselves are of a low degree of mentality. They frequently not only injure themselves but also other employees of intelligence. Is it not a fact that sufficient attention is not given in the selection of the man to fit the job?

More Care Needed in Engaging Employees

Employers do not give to their employing agencies sufficient thought. The man who is delegated to interview and employ applicants for positions should be of a high order of intelligence, knowing human nature and the requirements of the positions to be filled—such a man as could fill the position of general manager and whose qualifications would justify a commensurate salary. Such an employing agency would fill positions with men who would comprehend the dangers and necessities of their work with the result that there would be fewer accidents, greater efficiency in production, and less compensation to be paid.

In conjunction with such an employing agency we should have a qualified surgeon to examine applicants and pass upon their physical fitness to perform the work required; to learn if they are suffering from any occupational diseases with which the compensation act is now burdened, also to learn if they are suffering from any disabilities which the work they are required to do might aggravate, as the commission and courts hold that the employer must pay if such aggravation occurs.

When we have secured the ideal force, the superintendents and foremen should receive attention as a matter of prime importance. The foreman of today should be something more than a mere "driver." He should have intelligence, human instincts, and a perfect knowledge of the work to be done, so that inspiration and guidance will follow from his supervision. With such a foreman and force the known systems for the prevention of accidents would be effective, as the men would be sufficiently intelligent to understand and appreciate their merit.

It is true that in this country it is difficult to find men who will settle down and strive to become expert in their various lines. This difficulty, I believe, is due in a large measure to the union card which permits the slovenly and inefficient to fill the positions and receive the pay of the careful and skilled mechanic. When organized labor gives the same thought to the vices within its institution that it does to increasing its powers and perquisites by legislation, a new era will have arrived which will see the improvement of the laboring man. Until such time every effort should be made to select only the best.

The Utilities and the Public*

Best Interests of Both Are Common—The Pertinent Aspects of Public Regulation Are Set Forth with Impressive Clarity

By Arthur W. Brady
President Union Traction Company of Indiana, Anderson, Ind.

THAT which distinguishes public utility businesses from other businesses is their relations to the public. The manufacturer or the merchant, the farmer or the laborer, can pick his customers at will. He can, generally speaking, deal with one and refuse to deal with another. He can charge one customer one price and another a lower or a higher price, or no price at all. The amount and the quality of his product are determined not by rule of law, but by his own wishes, ability and business sagacity.

Not so with a public utility. Its every step is compelled by legal requirements or limited by legal restrictions. It has no option in the selection of customers, but must deal with all that offer, provided they fall within such reasonable classifications as may be established. It can make no differences between customers of the same class, but must treat all alike in matters of price and service. It cannot, as a rule, give its service or commodity away. It cannot even exchange that service or commodity for the services or commodities of others, but must sell for money, the universal standard of value. Its charges must be reasonable and just. It may not itself determine the amount and character of service and commodity which it shall furnish, but must conform to legal standards of adequacy and quality. As the Indiana utility commission act puts it:

> Every public utility is required to furnish reasonably adequate service and facilities. The charge made by any public utility for any service rendered or to be rendered either directly or in connection therewith shall be reasonable and just, and every unjust or unreasonable charge for such service is prohibited and declared unlawful.

Among the public utilities, using that term in its common acceptance and not in the restricted sense of the Indiana statutes, are comprehended the great transportation systems of the country, the street and interurban railways, the telephone and telegraph companies, the concerns which generate and distribute electric current for light and power, the gas and water companies and a number of other callings of a quasi-public

*Abstract of paper presented before Indiana Public Utilities Association, Bloomington, Ind., Jan. 14, 1922.

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nature. It would be difficult to exaggerate the importance of these agencies in modern life. Of those which deal with the intercommunication of men, Macaulay has spoken in often quoted words:

> Of all inventions, the alphabet and the printing press alone excepted, those inventions which abridge distance have done most for the civilization of our species. Every improvement of the means of locomotion benefits mankind morally and intellectually as well as materially, and not only facilitates the interchange of the various productions of nature and art, but tends to remove national and provincial antipathies, and to bind together all the branches of the great human family.

Invested in the utilities are many hundreds of millions of dollars, representing a large part of the accumulated wealth of the country. Their securities constitute a great share of the reserves of the savings institutions, the insurance companies, the trust companies and the banks of the United States. An illustration is found in the fact that according to the Comptroller of the Currency 70 per cent of the capital of the national banks was represented two or three years ago by such securities. Furthermore, so interwoven with our industrial and social system have these utilities become that their failure to keep pace in expansion of their facilities with the growth of population and industry would seriously retard and handicap the development of the country. Expansion, however, requires new capital in huge amounts, and capital cannot be obtained unless assured reasonable safety and fair treatment.

The facts thus briefly reviewed indicate the closeness and the importance of the relations between the public utilities and the public. So closely interknit are they that unless these relations be just and harmonious both the utility and the public will suffer.

In order to insure the proper performance by the utilities of their duties to the public, systems of governmental regulation have been established on a large scale. Originally regulation was administered by charter or municipal franchise provisions, or by legislative enactment. As the country grew and prospered, the magnitude and intricacy of the problems involved became such that during the past half century, and especially during the past twenty years, the system of regulation through a commission, authorized by the Legislature and appointed by the chief Executive, has become practically universal throughout the United States. These commissions are invested with extensive authority, the legislatures having as a rule delegated to them practically all their powers with respect to the establishment of rates, the requirement of adequate service and facilities, and the prevention of discriminations.

Objection is heard from time to time that these commissions, which represent the state as a whole and not separate communities, invade the right of local self-government, and threats of abolishment are made. It is worthy of remark that the development over a long period has been in the contrary direction. So great are the public advantages derived from the commission form of control that no state having once adopted it has returned to the former system of regulation by act of the legislature or by municipal control, or by a combination of the two. It may be accepted as an established fact that the commission form of public utility regulation will never be permanently superseded by a system the deficiencies of which created the demand for present methods.

In Indiana, commission regulation began with the enactment in 1905 of legislation creating a railroad commission. That commission at first had jurisdiction only over steam railroads, but in 1907 its jurisdiction was extended to interurban railways. In 1913 the Shively-Spencer utility commission act was passed, and a new commission called the Public Service Commission of Indiana was created. The jurisdiction of the new commission embraces the steam railroads under the railroad commission act (which remains in force), the street and interurban railways, the telephone and telegraph companies, the heat, light, power, gas and water companies, and elevator and warehouse companies. Interurban railways enjoy the doubtful distinction of being regulated under either or both the railroad commission and utility commission acts.

Among the powers conferred on the Public Service Commission of Indiana by the Shively-Spencer act is that of controlling the sales, consolidations and other transfers to the utilities, their stock and bond and other security issues, and the creation of mortgage and other liens upon utility property. Control in such vital matters as these means that the property and financial affairs of every utility must be administered as the state, acting through its commission, commands.

THREE OBJECTS SOUGHT

The fact is sometimes overlooked that the elaborate regulatory machinery which the state has thus erected, with all its provisions for control of property and finances and for utility valuations, when judged from the public standpoint, has three objects, and only three, namely:

1. To insure reasonable and just charges by the utilities.
2. To require the furnishing of reasonably adequate service and facilities by the utilities.
3. To prevent unjust and unreasonable discriminations by the utilities.

When these objects are attained, the public needs are satisfied and the public rights are protected; but this is not all there is to utility regulation. A utility, also, has rights which must be respected and enforced. It has the right to demand that regulation shall not deprive it of the opportunity to earn a reasonable return on the fair value of its property. This right is not given by the legislature or even referred to in the commission acts. It is conferred by federal and state constitutions.

The mere observance and protection of this right is not, however, enough to meet public or corporate needs. If adequate service is given, if improvements are to be made, if a utility is to grow and develop, it must be accorded such treatment with respect to rates and practices that it may compete for capital in the money markets of the country on an equality with other businesses subject to like risks. Otherwise, capital cannot be procured and development is impossible. Investors cannot be driven to pour their funds into unprofitable channels.

The line between good regulation and bad regulation, whether judged from the public standpoint or the utility standpoint, is not the line between confiscation and non-confiscation; it is the line between the policy which stunts utility improvement and growth and the policy which encourages and promotes utility improvement and growth. In that growth and improvement the interest of public and utility are one. High public authority has declared that the eventual success or failure of any system of regulation depends on whether that regulation is such as to check or to induce the flow of capital into the utilities. The only finished utility is a dead utility, and a dead utility means a dead community. Every live utility is growing, or struggling to grow. The Massachusetts commission has presented the fact in these forcible words:

> It should never be forgotten that our public companies are not finished. They are in process; they are constantly calling for new capital, and of recent years in increasing amounts. They must be kept on good trading terms with the investing public or the whole experiment of private ownership and public regulation of these public utilities companies will fail. It is as necessary to attract capital into the public service as it is to prevent the mismanagement of these companies or extortion by them. If regulation is to limit (as it should) the profits of stockholders to a moderate return, not greatly in excess of an investment rate, regulation must also protect, so far as it reasonably may, all investments honestly and prudently made and properly managed in the public service; otherwise there will be no such investments. It is entirely clear that in the long run the rate-paying public as well as the investing public will be best served if regulation makes as its fundamental guiding principle an attempt to protect investments honestly and prudently made and wisely managed. Any other theory involves essential injustice, tends to make the development of our public utility companies a speculation and not an investment, operates as a premium upon various kinds of fraud; invites into the public service undesirable manipulators instead of sound, level-headed business managers; makes every rate case an almost indeterminable and labyrinthine inquiry into values with endless conflicts between so-called experts.

The facts which I have thus presented are mere commonplaces to utility managers and to all students of the relations between utility and public. They must, however, be constantly borne in mind if any discussion of those relations be worth while. Good regulation benefits both public and utility. Poor regulation harms both. Good regulation depends not merely on the wisdom, knowledge, intentions and courage of the regulatory commission; it depends also upon the relations between the public and the utilities. If those relations are pleasant and harmonious, the pathway to good regula-

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tion has been smoothed and made easy. If strained and unhappy relations exist, the road of community, commission and utility will be rough and the stumbling places many. The greatest of all harmonizers is understanding. Says Solomon:

> Wisdom is the principal thing; therefore get wisdom, and with all thy getting, get understanding.

Utilities as a class are fair. They want only reasonable and just rates and want to furnish good service. The public wants to be fair, at least it does not want to be unfair, yet public and utility frequently clash because neither understands the position of the other.

In recent years we utility men have done much to present our problems and difficulties to the public, yet we have not done enough. Through the same period the public has learned much of our real situation, but it has not learned enough. It was once the common belief that every public utility was a source of great wealth, and many of the utility difficulties are due to that belief. Public knowledge of the true facts concerning railroad earnings, expenses and profits was gained only at the immense cost attendant upon governmental operation, a cost that the country will long continue to pay.

Let us see that the facts concerning the utilities are put fairly and fully before the public. There is nothing we are afraid to disclose. Full reports of our operations are, and for years have been, on file with the public Service Commission of Indiana, and in the case of some of us with the Interstate Commerce Commission also. Our records and properties have been examined and rejorted on time and again by expert public officials. The facts demonstrate the smallness of the margin upon which public utility business is done. Let the facts be known to the people, and let us convince the public that we are trying to do the best we can with the means at our disposal to furnish good service. There will then be little ground for complaint of the relations between the utilities and the public.

Budapest for the Next Convention

PRESIDENT SPANGLER of the Internationales Strassen und Kleinbahnverein has issued a notice that the second convention of that association will be held in Budapest in 1923. Meetings are held only every two years, and the last convention was held in Vienna, May 29 to June 8, 1921. The meeting in Budapest, it is hoped, will be held under somewhat better auspices as a longer time will be available for the preparation of reports. Members are requested to forward suggestions of questions they wish to be considered to the president, who is general manager of the Vienna Municipal Tramways.

The next meeting of the executive committee of the association will be held in Stuttgart, at the time of the meeting of the German Street Railway Association, when it is expected that a preliminary program will be drafted. The membership of the association now consists of 355 members, made up as follows: (a) regular company members (owning 371 roads), 254; (b) regular individual members, 43; (c) special company members, 37; (d) special individual members, 21.

New England Street Railway Club

THE February meeting of the New England Street Railway Club will be held Feb. 2 at the Copley Plaza Hotel, Boston, Mass. There will be no afternoon meeting. At the evening meeting there will be a report of the committee on the development of one-man car, motor bus and trackless trolley.

Dinner will be served at 6 p.m. Tickets are $2.50 each. The hotel management must be notified of reservations not later than Tuesday, Jan. 31.

American Institute of Electrical Engineers

THE midwinter convention of the American Institute of Electrical Engineers will be held in New York, Feb. 15-17. This is the first convention to be held under the new ruling of the board of directors which prescribes that four general technical meetings of the Institute be held each year. Technical sessions are arranged for Wednesday afternoon and evening, Thursday morning and afternoon, and Friday morning. On Thursday evening the Edison medal will be presented to C. C. Chesney, and Friday evening there will be the usual dinner dance.

Suggests Commissioner-General of Transportation

IN A RECENT report rendered to the Chamber of Commerce of the United States, its committee on railroads recommends that the Chamber of Commerce urge Congress to enact appropriate legislation authorizing the appointment of a special administrative officer with the title of commissioner-general of transportation, to hold office subject to the will of the president and at a compensation prescribed by the president.

The committee goes on to make several detailed recommendations with reference to the duties of this commissioner. Fundamentally, these resolve themselves into the suggestion that the commissioner should be selected because of his expertness, familiarity and experience in transportation conditions, that he should study and report to the president, that he should assist the Interstate Commerce Commission and should be entitled to be heard at all hearings before any board, commission, bureau or other governmental agency in all cases involving transportation rates, fares, regulation of terminal charges, wages, working conditions, or other subject matter affecting interstate transportation, and that he should be authorized to call on any department of the government for any information as to interstate transportation matters.

Most important, however, is the recommendation that "he should be authorized to grant federal charters to corporations proposing to engage in interstate transportation by land, water, or air, and upon application therefor, to convert state corporations so engaged into federal corporations, so that by such conversion the existing corporation shall not close or interrupt its business as a common carrier."

This report will be considered by the National Council of the Chamber of Commerce at its meeting to be held in Washington, D. C., on Feb. 8 and 9.

The committee on railroads, making this recommendation, consists of George A. Post, chairman; Walter S. Dickey, F. C. Dillard, Emory R. Johnson, Charles E. Lee, Thomas C. Powell, Wilmer W. Salmon, George W. Simmons, Alexander W. Smith, Harry A. Wheeler.

Electric Railways Help Realty Values

IN AN address delivered by Guy W. Wolf, Research Department, California Real Estate Association, before the annual meeting of that association Jan. 19, he showed that property values are dependent largely on transportation facilities. He pointed out that realty men had a direct interest in the maintenance of good transportation facilities and urged them to exercise their influence to help produce a reasonable attitude toward the traction companies.

American Association News

1922 Convention Committee Appointed

PRESIDENT TODD has named the committee members listed below as the committee on exhibit and location of the 1922 convention of the association. This committee plans to make a preliminary survey to determine the consensus of opinion regarding exhibit and also location. It plans to report to the executive committee at Indianapolis on Monday, Feb. 27, and will probably hold a meeting on Sunday, Feb. 26, at Indianapolis.

Those who have ideas as to the nature of the convention which should be held—exhibit or no exhibit—and as to the best place should communicate their ideas to the chairman, J. J. Stanley.

The names of the committee follow: J. J. Stanley, Cleveland Railway, Cleveland, Ohio, chairman; H. H. Adams, Chicago Surface Lines, Chicago, Ill.; George O. A. Barnes, Galena Signal Oil Company, New York, N. Y.; Luke Bradley, Stone & Webster, Inc.,

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Houston, Tex.; F. G. Buffe, Kansas City Railway, Kansas City, Mo.; T. W. Casey, National Pneumatic Company, New York, N. Y.; R. E. Danforth, Public Service Railway, Newark, N. J.; F. H. Gale, General Electric Company, Schenectady, N. Y.; Edward M. Graham, Bangor Railway & Electric Company, Bangor, Maine; W. F. Ham, Washington Railway & Electric Company, Washington, D. C.; H. Kenfield, *Electric Traction*, Chicago, Ill.; George R. Lyman, William Wharton, Jr., & Company, New York, N. Y.; J. C. McQuiston, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.; J. E. Morgan, Brooklyn City Railroad, Brooklyn, N. Y.; E. B. Meissner, St. Louis Car Company, St. Louis, Mo.; H. H. Norris, ELECTRIC RAILWAY JOURNAL, New York, N. Y.; D. E. Parsons, East St. Louis and Suburban Railway, East St. Louis, Mo.; A. M. Robinson, J. G. Brill Company, Philadelphia, Pa.; J. S. Thompson, American Brake Shoe & Foundry Company, New York, N. Y.; B. E. Tilton, New York State Railways, Syracuse, N. Y.; William Von Phul, Market Street Railway, San Francisco, Cal.

Resolutions on the Death of W. Caryl Ely and Henry J. Davies

AT THE meeting of the executive committee of the American Association on Jan. 20 the following resolutions were unanimously adopted:

RESOLUTION ON THE DEATH OF W. CARYL ELY

Whereas, W. Caryl Ely from 1903 to 1906 was president of what is now the American Electric Railway Association, and during those years took the leading part in reorganizing the association and laying the foundation for the present organization, and gave unstintingly of his time to the preparation of an enduring constitution and in securing for it the support of the members at large; and

Whereas, not only while president, but at all other times since he has been connected with the association, he has taken a great interest in its affairs and has always been ready with his wise counsel and his broad legal knowledge to assist the organization in its many ways; and

Whereas, through his personal charm, lovable nature and sterling character he has both endeared himself to a very wide circle in the electric railway business and won their highest respect; now, therefore be it

Resolved, That the officers and the executive committee of the American Electric Railway Association place on record the great loss to the electric railway industry and to the association and to the members of the association individually caused by the death of Mr. Ely; and, be it further

Resolved, That they take this means of testifying to the great regard, affection and esteem in which he was held in the electric railway industry, in which he spent so considerable part of his life, and, be it further

Resolved, That these resolutions be spread upon the minutes of the committee and a copy be sent to his immediate family.

RESOLUTION ON THE DEATH OF HENRY J. DAVIES

Resolved, That the executive committee of the American Electric Railway Association by this minute records its profound sorrow at the death of Henry J. Davies. To Mr. Davies was largely due the inception, organization and continuing usefulness of the American Electric Railway Accountants' Association. The industry is indebted to him for valuable and far-seeing efforts in the perfection and stabilization of electric railway accounting methods. As a member of many of the association's committees, he performed marked service for the industry and for this organization. A clear thinker, a patient student, a wise counsellor, a sterling gentleman, a faithful friend, in the death of Henry J. Davies the industry loses an able executive, the association a valued member, while his co-workers in the field mourn a trusted and beloved companion.

The secretary is instructed to spread this resolution upon the minutes of the committee and to convey a copy thereof to the family of the deceased.

Executive Committee Recommends Individual Membership Modification

AT THE regular monthly meeting of the executive committee of the American Association, held in New York City, on Jan. 20, it was recommended to the membership that the following clause, in section IV, paragraph (c), relating to individual members, as adopted at the October, 1921, convention of the association and which reads as follows, shall be stricken out:

"Except that those eligible to election as defined in paragraph (b) and officers and employees of non-member companies shall not be eligible to election as individual members."

The committee had found that restrictions not anticipated by the original wording of that clause were keeping several useful individual members from retaining their place in the association's ranks. It was thought that the rest of the clause, which gave the executive committee the duty of admitting only those individual members who, in the committee's mind, would be useful members of the association, was a sufficient protection.

The proposed constitutional change will be voted on at the midyear meeting at Indianapolis on Feb. 28. If adopted, the executive committee will probably adopt a method of procedure which would make the committee on individual and company section membership practically a board of examiners for the applications for individual membership in the organization.

OTHER MATTERS CONSIDERED

The subjects and meetings committee reported the program for the Indianapolis meeting as being complete. In addition to the program as printed in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 31, page 1152, Chairman Emmons announced that Mrs. Antoinette Funk, lawyer and public speaker of Washington, D. C., would give an address at the midyear conference on "A Woman's Viewpoint of Electric Railway Service."

The committee on publicity reported as to the amount of newspaper space which had been devoted nationally to electric railway problems during the past month and also as to addresses by Labert St. Clair, director of the Department of Advertising, Bureau of Information and Service, at the Providence, R. I., section meeting, and at the Indiana Utilities Association meeting at Bloomington, Ind.

The membership committee reported a net increase of 559 to 564, with the following additions: Associate members—Republic Railway & Light Company, Republic Engineers, Inc., Electric Bond & Share Company, Illinois Traction Company; new operating member—Indiana, Columbus & Eastern Traction Company. There were also six new individual members.

Resolutions on the death of W. Caryl Ely and H. J. Davies were adopted as recommended by the respective committees.

On recommendation of the executive secretary, Mr. Welsh, and the president of the Engineering Association, Mr. Kimball, and of the finance committee, the executive committee authorized the executive secretary to add a special engineer to the staff. This is not so much an addition to the staff as it is the replacement of Mr. Welsh himself in his former position of special engineer.

On recommendation of the representatives on the joint committee of National Utility Associations, the executive committee authorized a contribution of $2,000 toward its expenses to continue the work under way.

President Todd announced the appointment of the exhibit and location committee for the annual convention in 1922. This committee is named elsewhere in these columns.

The next meeting of the executive committee will be held Feb. 27 at Indianapolis, the day preceding the midyear conference.

Those present at the meeting on Jan. 20 were: President R. I. Todd; Vice-Presidents B. I. Budd, C. D. Emmons and J. N. Shannahan; presidents of affiliated associations, C. S. Kimball and L. H. Palmer; operating members at large, H. E. Chubbuck, H. G. Bradlee and R. P. Stevens; manufacturer member, George Tontrup; Past-Presidents, A. N. Brady and L. S. Storrs and Executive Secretary J. W. Welsh.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Service Being Restored

Strike at Richmond Enters Second Week—Company Building New Personnel

The second week of the strike on the railway lines of the Virginia Railway & Power Company finds the company gradually restoring service with new men and with all efforts of the authorities to find a basis of arbitration so far unsuccessful.

General Manager Harvell said that there were forty-two cars in operation in Richmond on Jan. 24, while eighty-two were in operation in Norfolk. The men in Petersburg refused to go out. As the situation stands therefore service is normal in Petersburg, is approaching normal in Norfolk and is about forty per cent normal in Richmond. As for Portsmouth, no effort has as yet been made to resume service there. Service on the Richmond-Petersburg Interurban line has been partly resumed.

The strikers continue their orderly attitude and have given the police little trouble. Many of the old men are running jitneys and others are acting as jitney starters at important corners, assisting passengers into motor cars and seeing that they are properly directed.

Company Rebuilding for Future

About 300 jitneys are in operation and hundreds of private cars which make no regular charge and going up and down the streets with placards inviting people to ride free rather than patronize the street cars.

Pressure is being brought on the company by the municipal authorities of both Richmond and Norfolk to arbitrate. President Wheelwright has several times agreed to arbitrate wages provided the same arbitrators were empowered to arbitrate fares, thus settling the problems of the income and the outgo. Without some provision made to raise the money, Mr. Wheelwright has declined to enter into an arbitration on the question of wages alone. In Norfolk it is proposed to make the small one-branch Council the arbitrators. Richmond still has the old-fashioned two-branch Council of thirty-two members.

The Richmond City Council has in fact adopted resolutions demanding arbitration. It holds over the head of the company the threat that if it does not consent to arbitration, the Council will revoke the 6-cent fare privilege granted more than a year ago, and require the company to revert to the fares named in the franchise—six tickets for a quarter and two tickets for 5 cents before 7 a.m. Since the company has complained of a large falling off in the number of persons riding in the last year, while the population of the city has increased, a number of councilmen hold to the belief that the company would in the long run be better off with a 5-cent fare than with the present 6-cent fare. The company asked forty-eight hours in which to reply to the ultimatum of the City Council.

On Jan. 22 fifty men were brought to Richmond through a labor agency from the North. The company avoided employing the term strike-breakers in its statement regarding its use of these men, but it is admitted that they are experienced men. On Monday these men refused to work unless allowed to operate in pairs. General Manager Harvell insisted that all of the imported men go out as motormen, each with a conductor who was a local man and knew the run and the city. The men refused to work under these conditions, and after some palaver were summarily discharged.

No further efforts, it was stated on Jan. 24, would be made to obtain strike breakers, but every day the company is taking on men, many of whom have in past years had street car experience here or elsewhere, though it is admitted that there have been few if any desertions from the union ranks. Each day an additional number of cars is in operation and the company promised for Jan. 25 a service on all lines at least 50 per cent normal, with the reopening of several suburban lines which have been without service since the strike began.

The company will have nothing further to do with the strikers. It says that they have now been discharged. If there is to be any arbitration or change in the wage scale, the company officials assert it will be by agreement with the men now working—not with those who quit their posts to go on strike and who have since been formally discharged. The unionizing of the system, the company asserts, it will not consent to under any circumstances.

The company on the night of Jan. 25 again declined the demand of the City Council of Richmond for arbitration of the issues involved in the strike. As stated previously the Council on Jan. 23 threatened that unless the company consented to arbitrate the city would force a return to the 5-cent fare. With this in mind both branches of the Council met on Jan. 25. The Common Council promptly adopted a repeal of the present 6-cent fare but the Board of Aldermen later refused to suspend its rules to consider the matter and then referred the question to committee.

The Council also failed to adopt an ordinance reducing the jitney license so as to open the streets to motor cars operated by strikers in competition with street cars.

$5,500,000 Valuation Fixed

Grand Rapids Valuation Decision Ends Long Dispute—Franchise Election Next September

A valuation of $5,500,000 has been agreed upon between officials of the Grand Rapids (Mich.) Railway and the City Commission for the property of the railway. The company will receive a thirty-year franchise, with a return of 8 per cent on the new valuation. A revaluation will be made after five years, the 8 per cent return remaining in effect. Until the election on the franchise on Sept. 12 the company will operate under the new agreement. The commission is now drafting the franchise to be presented to the voters. It is to be based on the service-at-cost plan.

The resolution on the railway valuation presented to the City Commission by the special committee is as follows:

> The offer of the company, file No. 12762, of a valuation of $5,650,000, coupled with a thirty-year franchise without revaluation, was not considered favorably by your committee, and the counter offer of $5,500,000 subject to revaluation at the end of each five-year period at the request of either party, was finally agreed to by the committee.
>
> As a result we recommend that the value of the property used and useful in connection with the utility, as included in the appraisal of Oct. 31, 1920, plus additions to the property subsequent to that date, be fixed at the sum of $5,500,000 as of this date. This value, however, to be subject to revaluation at the end of each five-year period at the instance of either party.
>
> We feel that we have done all we can in the premises and that this is the lowest valuation that will be given consideration by the company, and we believe that the people are entitled to have a franchise submitted to them.

Negotiations between company officials and the City Commission have been carried on for more than a year. The city at first placed the valuation at $5,076,000, while the company insisted on a figure of $6,500,000. This amount it later reduced to $6,270,000. In August L. J. DeLamarter, manager of the railway, stated that a valuation of $7,000,000 with an 8½ per cent return was the best valuation for all concerned. When negotiations were started, a committee of engineers representing both the city and the company had agreed upon a historic valuation without depreciation of $4,468,360, to which was added material and supplies account of $131,812 and a working capital of $107,040. The five-year valuation, from 1915 to 1919, without depreciation, was placed at $6,718,463. With material and supplies and working capital the total was $7,509,992. The reproduction valuation inclusive was set at $10,591,414.

In previous issues of the Electric Railway Journal in which the Grand Rapids dispute has been discussed it has been pointed out that the franchise there expired on April 23, 1921.

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Commission Defends Decision

California Body Declares Return Provided Pacific Electric Is Less Than Fair Rate—Defends Its Decision Against Public Attack

Since the California State Railroad Commission of Dec. 24, 1921, granted an increase in passenger rates on Pacific Electric Lines, effective Jan. 1, 1922, certain communities have opposed the increases by attacking the Railroad Commission through the press and community mass meetings. Claims were made that the commission's report on the affairs of the company did not take into account alleged extravagance and enormous salaries paid to its officials by the railway, nor did the reports fully consider the company's financial condition.

A REHEARING was set for Jan. 24 in Los Angeles as asked by the Hollywood Chamber of Commerce and other communities. The Hollywood Chamber of Commerce has engaged Paul Ost, assistant engineer of the San Francisco Municipal Street Railway lines, to prepare a report on the commission's costs of operating the Pacific Electric Lines. Mr. Ost is attempting to compare service at cost of the San Francisco Municipal Lines against the figures of the commission. The commission on Jan. 17 denied the other communities permission to extend the date of the hearing, but stated it is probable that the Hollywood protest will be extended.

The commission in defending its decision against the public attack issued a statement on Jan. 17 justifying the increase in passenger fares on the Pacific Electric lines and pleading for the public to get a real understanding of all matters pertaining to the case.

The commission's statement is in part as follows:

The underlying principles of rate making are simple enough, and so far as we know are denied by nobody. Certain misconceptions regarding them are very prevalent, however. One is that the commission allows for whatever expenses are actually incurred in operating, regardless of extravagance or economy. The exact reverse is the case. The other is that the commission "guarantees," or at least undertakes to assure, dividends on stock, "watered" or otherwise. The fact is that in rate making capitalization is not a factor. If a fair return, figured not on the capitalization but on the actual property used and useful in the business, will pay interest and dividends these may of course be paid, but if the financial structure is such that this cannot be done, the commission does not understake to meet this condition. Even a fair return on the property itself is not guaranteed, and in many cases cannot be obtained. In this case, for instance, the return provided is less than a fair return on the valuation of the property and will not make possible, and is not intended to make possible, any dividends whatever to the stockholders.

The continuance of the service of the Pacific Electric Railway and its extension and improvement are vital to the prosperity of Southern California. The Pacific Electric carries 274,088 passengers each day and is the third largest freight carrier in California, being outranked only by the Southern Pacific and the Santa Fé. There is no substitute for this service. For it to stop suddenly or decline gradually would be a calamity quite as disastrous to the people as to the owners. Not only its patrons but the whole business of Los Angeles would suffer.

It is a common but dangerous error to assume that the continuance of this service is a matter of course. It is not. No public service, whether privately or publicly owned whether under governmental regulation or unrestrained private initiative, can continue permanently to spend money which it does not from some source receive, nor can it invest money which it has no means of obtaining. Under public ownership, to be sure, deficits can be taken from the people compulsorily in taxes which they decline to pay voluntarily in rates, but under private ownership a company rendering service has no source of income except the ratepayers and no source of capital except the investing public. Under either system the necessary cost of the service is paid by the people or the service ceases to be rendered. Unless the commission is to prevent the companies under its jurisdiction from rendering service and securing capital, it must fix rates which will provide three things: Income to pay operating expenses or the service cannot operate; a depreciation fund or the property will disappear, and a return on the investment, or investments will not be made. The problem of the commission is to ascertain what rates will meet these conditions, if reasonable rates will do so, and to determine a just distribution of these rates among the groups of ratepayers.

In this case, since June, 1920, a corps of expert engineers has been at work upon the valuation, the accounting, the financing and the service conditions of the company. The first-hand ascertainment of facts was exhaustive and the check of the company's figures searching.

The reports of these engineers, covering many thousands of pages, have been critically analyzed and cross-examined at many and long continued hearings, at which the company, the cities and the commission were represented. Any statement of fact which was questioned or challenged has been critically re-examined, with its supporting data, and no conclusion of fact has been reached which did not meet all these tasks. The statements here given are, therefore, not to be met by superficial and uncertain generalizations from a few imperfectly known facts. They are based on exact and exhaustive knowledge.

Commission Knows It Knows

The commission knows exactly what the present service costs, where every dollar paid by the company goes, whether for labor, material, power, taxes or other charges. It knows exactly that in 1920 the company had an income of $15,346,346. It knows that not only was all of this money spent in the operations of the company in that year, but that the Southern Pacific Company (owners of the Pacific Electric Railway), in addition, assumed a deficit of $1,158,045. We estimate, not by guesswork but by methods of long-tested soundness, that the rates fixed and the service ordered in the recent decision will produce an annual income of slightly over $17,000,000. And we know, with reasonable certainty, what use will be made of this income in 1922 and following years. More than 60 per cent of the operating expenses will go for wages. The salaries of all the general officers aggregate $38,992.

The cost of electric power amounts to more than 10 per cent of operating expenses, while repairs cost normally about $3,000 000 and taxes will be from $700,000 to $800.000. These operating costs amount altogether to about $13,000,000 which does not include interest on bonds or borrowed money, expense for extensions and improvements or for unforeseen losses.

In fixing rates the commission was guided by certain fundamental considerations. No change was made in freight rates, and hence this discussion is confined to passenger service. The Pacific Electric gives two distinct kinds of passenger service—interurban and local street car service.

The rate-fixing principles guiding the commission may be summarized as follows:

1. A distinct local service should earn at least the bare cost of operation, disregarding profit entirely.
2. The distance of the ride has a bearing on its cost.

As to the first principle, it was established without a question of doubt that the company's street car service practically everywhere was operated at a loss and that the tendency was to place the loss upon the interurban passengers. It follows that unless local systems can be placed on a self-sustaining basis they must be abandoned. Secondly, as to distance, the commission found that in Los Angeles the loss was caused mainly by the great distance the average passenger has to be carried. Obviously, to carry a passenger 10 miles costs more than to carry him a mile. This is the reason for the zone system. The question here, of course, was where to draw the line. It would be neither practical nor good public policy to charge a different fare for each additional mile. In determining the zone discretion and common sense had to be used.

In all zoning there is bound to be a fringe district of apparent unfairness. But the proper test of the reasonableness of the fare is the average distance of travel within the zone. After giving full consideration to these circumstances the zones were established in Los Angeles with regard for the needs and convenience of the public. Even with the zone rates the Los Angeles service barely justifies continuance.

In conclusion the commission states that while automobiles, private and public, have cut the passenger revenue, the automobile has not yet, if it ever will, become a substitute for electric local and interurban railways. The decision of the commission, the statement points out, calls for three big things: The improvement of the Pacific Electric system and service, equality of cities based on geographical position and progress toward the inauguration of a universal transfer system.

Full Statement of Detroit Matters to Be Made at Annual Meeting

A. J. Ferguson, vice-president of the Detroit (Mich.) United Railway, was interviewed by the Montreal *Gazette* on his return to that city on Jan. 17 about the affairs of the railway. Mr. Ferguson, who represents the Canadian interests in the company, stated that the telegraphed reports of the events that had surrounded the meeting in Detroit had been misleading and apparently made with only a superficial knowledge of the situation. After quoting Mr. Ferguson with respect to the history of the early negotiations at Detroit the *Gazette* said:

The recent reports, Mr. Ferguson stated, were misleading in another important particular, in that it was erroneously stated that Mayor Couzens had offered $20,000,000 for the property; neither was it true that the property for which this offer was supposed to have been made included all the property, of which the electors by their vote in 1919 declined to sanction the purchase for $31,500,000.

Mr. Ferguson went on to state that the shareholders of the company were being circularized in the above connection and that they will have placed before them a full and complete explanation of the situation at the forthcoming annual meeting, which takes place on Feb. 7. Mr. Ferguson declined to discuss the reasons for the failure of the company and the city to come together in the recent negotiations, but stated that when they were known at the time of the annual meeting, the whole matter would be cleared up.

Published statements of the company's trackage make it clear that after the company has disposed of its city lines, which amount to about 300 miles of track, it will still operate some 600 miles of suburban roads which radiate around Detroit, connecting with 100 towns and villages and passing through 160 different municipalities.

It is generally stated, too, that the company's net earning capacity has greatly improved during recent months by reductions in labor, coal and other costs. The company's power is steam generated and it is understood that the cut in coal prices since the time prices were at their peak now amounts to a saving of about $5 000 a day.

A cut in wages was made some time ago and there is already talk of another reduction in this connection.

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Trackless Trolley Franchise Is Sought in Milwaukee, Wis.

An ordinance was introduced in Council on Jan. 9 granting the Milwaukee Electric Railway & Light Company the right to install and operate as a part of its railway system trackless trolley busses on Lincoln Avenue from Clinton Street to Twenty-seventh Avenue. The company is authorized to extend its existing street railway system by extending its trolley wires in a manner suitable for the operation of "electric trolley street cars operated without rails directly on the surface of the street for the carrying of passengers," with all necessary or convenient poles for the support of trolley span wires.

The ordinance provides that the company shall not be subject to the obligation to pave or repair the paving on the street on which it is proposed to render the trackless trolley bus service. This section may arouse the opposition of certain city officials, though the ordinance was introduced as a result of favorable action by a number of civic organizations which favor the operation of the trackless trolley service.

As reported in ELECTRIC RAILWAY JOURNAL of Jan. 7, 1922, page 57, the company has taken the position that if permission is granted for the operation of the service, it will undertake to furnish it as a substitute for rail service which the high costs and lack of assurance of sufficient traffic to support a rail line have made it unable to render.

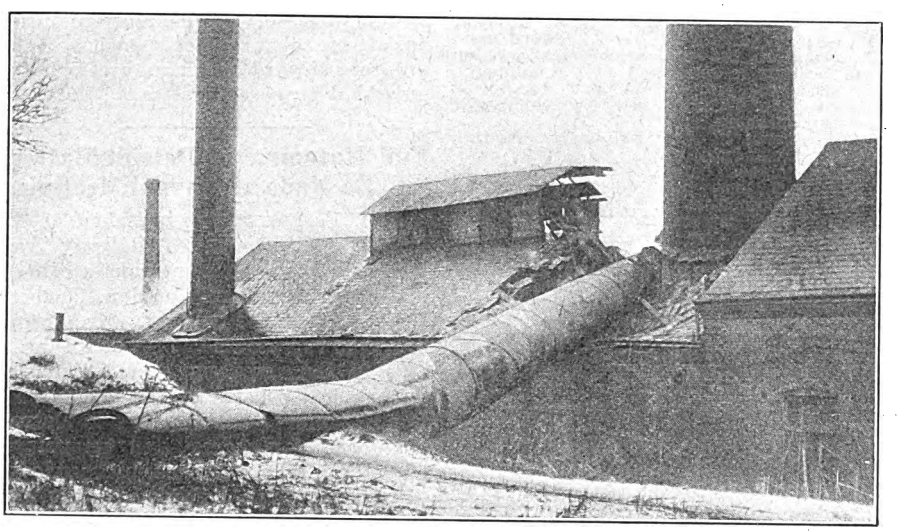
Proposed Electric Interurban Being Fostered

Promotion of an electric interurban line along the Texas-Mexican border from Brownsville, near the mouth of the Rio Grande, to Del Rio, about 300 miles up the river, is being undertaken by Northern and Eastern capitalists. Large land owners who would be benefited are back of the project and it is reported that they are willing to undertake the greater part of the financing.

The line would follow the course of the Rio Grande for the greater part of the way, and engineers who have made preliminary surveys, say that water power developed on the river would be adequate for the operation of the line, and would also generate power for whatever development might follow in the agricultural and industrial centers thus created.

Storm Cuts Down Steel Stack

During the heavy wind and snow storm of Jan. 11 the 125-ft. steel stack on the Lincoln Avenue power plant of the Trenton & Mercer County Traction Corporation, Trenton, N. J., was blown down. It crashed through the boiler room, breaking connections with the main feed lines. This caused a suspension of the traffic on all the city and suburban lines of the company for some time, and the corporation had to borrow power from the Public Service Railway lines. A new stack is now being built. The New Jersey & Pennsylvania Traction Company and the public Service Railway also suffered delays by falling wires and poles.



STEEL STACK IN TRENTON BLOWN DOWN DURING STORM

Seattle Wage Dispute Adjusted

The tangle in adjusting the salaries of trainmen of the Seattle (Wash.) Municipal Railway, resulting from changing the rate of pay to a monthly basis, has finally been worked out by the City Council and the new scale announced. The railway trainmen had heretofore been grouped in three classes, and under the new salary ordinance are grouped in four classes, thus causing new confusion.

A resolution was finally adopted providing that all trainmen entering the railway service on or after Jan. 1, 1922, shall receive $135 a month; those who received $4.75 before Jan. 1, 1922, shall receive $145 a month; while the $5 and $5.25 a day men shall receive $150 and $155 a month respectively. Time and a half for overtime will continue to be paid the trainmen.

Report Presented on $5,655,000 Project

Extension of the Dorchester tunnel beyond Andrew Square and the electrification of the Shawmut branch of the New York, New Haven & Hartford Railroad, for the purpose of creating a rapid transit system in the Dorchester district, near Boston, at an estimated cost of $5,665,000, is planned in detail in a report filed in the Legislature by the Public Utilities Commission and the Boston Transit Commission, acting jointly. These two bodies were directed to study the proposition, which was first suggested by Charles A. Ufford of Dorchester, and report back to the General Court, under an act passed at the last session.

The plan, in brief, provides for taking over the Shawmut branch of the New York, New Haven & Hartford Railroad, running the present Dorchester tunnel trains along the Shawmut branch roadbed to Fields Corner and using high-speed trolleys on the Shawmut branch tracks beyond Mattapan Square. Under this plan passengers would transfer from the tunnel trains to the surface cars at Fields Corner station of the Shawmut branch. The station would be rebuilt and extensively enlarged.

The trustees of the Boston Elevated Railway, the report continues, are ready to proceed with the plan, while the New Haven Railroad officials have said they are willing to co-operate to the best of their ability. Concluding, the report says:

> The plan has been extensively studied, and it is felt that it will coördinate with any future extensions which we can foresee and that it itself is worthy of immediate adoption, if financially practicable, as a large step forward in the right direction. Further extension of this or similar plans may well await the results of accumulated experience

The plan for carrying out the project depends, of course, on the ability to secure the funds necessary to finance the undertaking.

Railway to Care for Disabled

A plan to provide for all employees who, because of age or disability, may be unable to continue in active work has just been announced by the Georgia Railway & Power Company, Atlanta, Ga. The plan is effective from Jan. 1, 1922, being divided into four separate classes as to beneficiaries as follows:

Class A—All employees in the service of the company for thirty consecutive years will be permanently retired upon reaching the age of 60, receiving annually from the company a sum equivalent to 30 per cent of their earnings the twelve-month period previous to retirement.

Class B—Employees in service twenty-five consecutive years retired on reaching 60 and receive a sum equal to 27½ per cent of earnings last year before retirement.

Class C—Employees in service twenty consecutive years retired on reaching 60 and receive a sum equal to 25 per cent of earnings last year before retirement.

Class D—All employees in the service of the company for fifteen consecutive years who become totally disabled for any reason, other than self-inflicted, or by injury arising in the course of their employment, shall be retired by the company and receive a yearly sum equal to 25 per cent of their earnings the twelve-month period before retirement.

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Changes in New York State Taxes Urged

A joint legislative committee in New York, which has been studying the taxation of utilities for some time, made its report to the Legislature on Jan. 26. It says, in part:

The present system of taxing these corporations in the State is a chaos of intricacy and complexity. The staff of the committee has reduced these complicated taxes to a basis which makes possible a comparison with the taxes paid by other business interests. The grossest inequalities come to light. Many of the companies, particularly some of the electric railway companies which are bound by a fixed low rate of fare have been literally taxed into bankruptcy. Based on net income, the business taxes on electric railways are nearly four times as great as the corresponding taxes on manufacturing corporations. If local real estate taxes are taken into account, electric railways pay over 38 per cent of their net income in taxes. This is nearly five times the tax paid altogether by manufacturing companies, for example.

Not all the public utilities are so unfavorably situated, because some have been more successful in their efforts to shift their burdens to the consumer through increased rates. Every class of public utility, however, pays heavier taxes than either manufacturing or financial institutions.

As an immediate means of improvement, the committee recommends that the entire series of complicated State taxes on public utilities be at once abandoned, with the exception of the special franchise tax which cannot be immediately abandoned for the reason stated above; and that in substitution therefore a "gross net" tax be established, against which special franchise taxes, pending the passage of the constitutional amendment, may be used as an offset. It is contemplated that the real estate of public utility corporations, closely defined, shall continue to be taxed locally.

A more extended abstract of this report will be published next week.

Parallel Case Noted in San Francisco on Eve of Seattle Suit

On the eve of their suit to prevent the city of Seattle, Wash., from using general tax funds for the operation of the Municipal Street Railway, the "fourteen taxpayers" scored another victory, when the Circuit Court of Appeals at San Francisco denied the Puget Sound Power & Light Company a rehearing of its suit to prevent the taxpayers from proceeding with the other action in the Superior Court of King County. Thus, the last barrier against the progress of the suit was removed, and it has been docketed for trial Jan. 17.

The refusal to grant a rehearing of the power company's injunction proceedings followed a decision in the Circuit Court of Appeals of San Francisco on Dec. 5, in which the jurisdiction of the Superior Court of King County, questioned by the Stone & Webster interests, was upheld. The traction company maintained that jurisdiction lay in the federal and not the state tribunals. After that decision was given by the Circuit Court, the traction company sought a rehearing of the case, which was refused.

Attorneys for the "fourteen taxpayers" declare that the recent decision confirms the position taken by the taxpayers that the traction company was not a party to the action. James B. Howe, attorney for the traction company announces that an application for appeal from the decision of the Circuit Court will be made to the Supreme Court of the United States. This, however, will not delay the case, for which trial is set for Jan. 17.

Boosts Oregon Development Plans

Development plans of the Portland Railway, Light & Power Company, Portland, Ore., are told in a three-quarter page display in the New Year's edition of the *Morning Oregonian*. The proposed construction is called the Three Links project and will extend over a period of approximately three years. The company has worked out the preliminary plans for the extensive building whereby the water flowing into the Clackamas River can be utilize The work will be done in four units. The preliminary step is the building of a road for the carrying of materials required in the actual construction of a diversion dam about 4 miles above the mouth of Oak Grove fork; the building of the 8½ mile conduit; a twenty-seven 500-hp. water wheel, and the building of a transmission line.

The remaining steps consist of the construction of a 70-ft. dam on the Oak Grove fork, the construction of tunnel through Oak Grove butte to convey the water to the fork and of a low diversion dam. The final step in the plan is the replacement of the low diversion dam mentioned above with a 130-ft. earth-fill dam to form a reservoir. This reservoir would be 3½ miles in length.

The article is well illustrated with four cuts showing the development of the Clackamas River.

Railroad Legislation Opposed in Present Form

The Chamber of Commerce of the United States is preparing to oppose vigorously any movement that may be made in the coming session of Congress to repeal provisions of the transportation act which authorizes the Interstate Commerce Commission to make rates to provide adequate revenue for the railroads and to regulate intrastate rates. The position of the national chamber is that these provisions of the act should not be repealed until they have had a fair test.

In a communication sent out recently to the constituents of the chember Joseph H. Defrees, president, said that enactment of the proposed legislation would repeal those sections of the transportation act by which the Interstate Commerce Commission is directed to establish rates that are reasonably adequate to the railways and just to the public. According to Mr. Defrees, rate regulation will return to the chaotic condition which existed for many years because of the conflict of authority between the Interstate Commerce Commission and the forty-eight state commissions if the Interstate Commerce Commission is deprived of all authority to regulate intrastate rates as proposed in the Capper bill.

News Notes

Inspectors of Safety Appliances Notes.—The United States Civil Service Commission has announced open competitive examinations for inspection of safety appliances and inspector of hours of service. The examination will be held on March 22 and 23.

99 Per Cent of Year's Trips on Time.—Of 509,658 trips made by cars of the Spokane & Eastern Railway & Power Company, Spokane, Wash., during 1921, more than 99 per cent were made on time. More than half of the belated and lost trips were due to causes which were not under control of the company. Parades, the greatest single cause, and breakdowns of trucks and automobiles contributed to delays.

$570,162 Voted for Transit Needs.—An appropriation of $570,162 was recently voted by the Board of Estimate of New York City, N. Y., for the use of the Transit Commission. Of this amount $500,000 will be used for the requirements of 1922 and the remainder will meet the payroll expenses for the last two weeks in December, 1921. The appropriation was made following the decision of the Court of Appeals upholding the law under which the new Transit Commission in New York is now functioning.

Wants to Lease Lines.—The Mobile Light & Railway Company, Mobile, Ala., offered on Jan. 13 to rent its five branch lines for $1 a year, lessee to operate them steadily, give service equal to that now being furnished by the company, and also to furnish a substantial bond. Higher rates have been asked by the company of the Alabama Public Service Commission, the company claiming its monthly deficit approximates $7,000. The present fare is 7 cents. The offer to lease the lines was advertised by the company in the daily papers of Mobile.

Wants Interurban Line Established.—To prevent the scrapping of the Gainesville-Midland Railway in north Georgia an effort is being made by civic organizations of various cities and towns along the line to have the Georgia Railway & Power Company establish an interurban line between Athens, Ga., and Tallulah Falls, where the power company is preparing to carry out extensive water power development projects during the next few years. Purchase of the Tallulah Railway, owned by the Southern Railway, is advocated in order to complete the system. Committees representing the civic associations of the north Georgia cities and towns interested in the project will be appointed shortly to confer with officials of the power company in Atlanta.

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Financial and Corporate

$1,079,726 Ordered Restored

Court Increases Judgment Allowed at Columbus Under Ruling of Special Master

A judgment of $1,079,726 in favor of the Columbus Railway, Power & Light Company, Columbus, Ohio, against E. W. Clark & Company, Philadelphia, former operating manager of the Columbus company, was rendered on Jan. 21 by Judge E. B. Kinkead of the Franklin County Common Pleas Court. The judgment far exceeds in scope the recommendations of Master Commissioner George B. Okey and goes almost the entire length of the complaint entered by the present home management of the company against the former managers, sustaining in all save one count the contentions of the complainants.

ITEMS INCLUDED IN JUDGMENT

A list of the items in the judgment against the Clarks showing amounts to be returned by the Clark Company is as follows:

1.	Amount to be returned under management contracts.....	$224,716
2.	Amount to be returned under construction contracts and fees	49,828
3.	Amount to be returned as profits on notes and bonds under McMeen contract	82,557
4.	Amount to be returned as profits on $1,000,000 of bonds without knowledge of directors.	14,862
5.	Amount to be returned as profits on notes without knowledge of directors	20,423

Amounts to be returned by the Clarks, expended by them:

6.	By E. K. Stewart, general manager of the Columbus company, as its agent.....	386,202
7.	By E. K. Stewart, general manager, from moneys known as the "John Scott Anderson" fund, as its agent	179,408
8.	By E. K. Stewart, general manager, to C. C. Philbrick, ostensibly for advertising in the *Week*	54,995
9.	In attempting to surrender the Columbus company's franchise, as directed by E. W. Clark & Company	66,734
	Total	$1,079,726

The master commissioner's report embodied recommendation that judgment be made against the Clarks in the amount of $224,476, but the court saw fit to go further than was urged by the commissioner.

COLUMBUS UTILITY BADLY CRIPPLED

The judgment is entered on two outstanding propositions of law: First, that the directors of Ohio corporations are without authority to delegate their duties to others by means of "management contracts"; second, that directors occupy the position of trustees with relation to the stocholders, which position compels them to account minutely for their acts and administration of the company's affairs.

After reviewing the history of the Slaymaker case, in which the company appears as a cross-petitioner, the court first disposes of the objection raised by the Clark interests upon the ground that the case before the court was one concurrently of law and equity and hence the statutory limitation for such suits was four years, a point which, if sustained, would have left the Columbus utility badly crippled in its attempts to retrieve its losses, the court held that the case was one of equity, involving a ten-year statutory limitation.

In commenting on the management contracts phase of the company's affairs, Judge Kinkead says:

> It is the settled law of this State that directors of a corporation must themselves manage the corporate business of the corporate body with the view solely to the common interest of the stockholders and that they cannot directly or indirectly transfer such management and control to others.

The court then traces the history of the Clarks' connection with the company from 1892, when they began assisting in the formation of the company until the severance of connections in 1918. The Clarks began to take an interest in electric street railways in 1889. The first management contract was entered into with the utility in 1912, the Clarks to assume the management of the company and to receive 1½ per cent of the gross receipts in return. It was under this contract that Samuel G. McMeen was brought to Columbus by the Clarks, his salary being paid by them. Clarence M. Clark was named vice-president, E. K. Stewart being retained as vice-president, treasurer and general manager.

The court avers that the purpose of the Clark plan was to

> Control the action of the president and the board of directors, the paramount object being to secure all of the business of the railway within the scope of its business—the financial business, the engineering business and the auditing of the books; the latter, of course, is closely related to the financial business.

Later the court said:

> The final general results of the affairs of the company, after years of exploitation for personal gain by Clark & Company, furnishes the strongest evidence that could be secured. The company lost its financial standing, lost its good will, which meant everything; came nearly losing its franchise rights by attempted surrender, and came near the verge of general liquidation —all under the selfish management of persons whose sole desire was to invest the funds of the Clark banking house and to aid the bank to carry out its purposes and business.
>
> E. W. Clark & Company could have had no other purpose but to further the interests of the bank. Individual representation in the official positions obtained in the railway was for the sole purpose of personal gain for E. W. Clark & Company, so that its individual representatives could not fairly legally or equitably represent the stockholders of the railway in their dual capacity as trustees.

Counsel for the Clarks at Columbus said that the decision by Judge Kinkead would without a doubt be carried to the Court of Appeals.

Ohio Interurban Fails

Railway Operating 209 Miles of Line Passes Into Hands of President Wilson as Receiver

The Cleveland, Southwestern & Columbus Railway, operating 209 miles of track in Ohio, is now being operated under a receivership. Frank H. Wilson, who became president of the company last May, is acting as the receiver. The Cleveland, Southwestern & Columbus Railway is the second large Ohio interurban line to go into the hands of a receiver within the last twelve months. The Ohio Electric Railway is the other road so quoted. The receivership for the Cleveland, Southwestern & Columbus Railway became effective on Jan. 20, when the company admitted insolvency in the federal Court.

Mr. Wilson was named receiver by Federal Judge Westenhaver, after the filing by the General Electric Company of a petition alleging insolvency and requesting receivership. The General Electric Company alleged that the interurban company owed it $6,565 for equipment and also set forth that there are other creditors with claims totaling $200,000. The company has more than $7,000,000, par value, of bonds outstanding. Its authorized capitalization is $10,000,000, of which $6,648,000 is outstanding.

According to Attorney Frank H. Ginn of Tolles, Hogsett, Ginn & Morley, counsel for the company, the receivership was acceded to by the company to save the system from disintegration through individual creditor proceedings in lower courts. Mr. Ginn said that the receivership offers an opportunity to formulate and adopt some plan which will be fair to all interests, including the stockholders.

In addition to furnishing interurban service out of Cleveland to such cities and towns as Galion, Bucyrus, Ashland, Mansfield, Wooster, Elyria, Oberlin, Norwalk, Lorain, Berea, Medina, Amherst, Grafton, Wellington, West Salem, Lodi and Crestline, the company also sold large quantities of power in the territory tapped by its lines.

An official statement regarding the receivership made by counsel for the company follows:

> Mr. Wilson (the receiver) is an old steam railroad man. He became president of the Southwestern in May, 1921. Under his direction important economies and betterments were made but the extreme loss in gross operating revenues due to unfavorable economic and industrial conditions prior to his management so decreased the net revenues that the company has been unable to provide funds for the payment of bond interest.
>
> Many creditors have been persistent in forcing claims for payment and recently two banks of deposit, located outside Cleveland, applied the company's balance to obligations. Under these circumstances it was impossible for the company longer to operate under corporate management.
>
> The holders of some of the junior securities of the consolidated system have realized for some time that a reorganization would ultimately be required in view of the maturity in 1922 and 1923 of a number of underlying bond issues.
>
> A master will soon be appointed to pass on the outstanding accounts payable for supplies heretofore used in operation and it is hoped that the creditors holding such claims will not be inconvenienced for any great length of time.

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$2,340,000 Saving Expected

Prospects Bright that Interborough Will Be Able to Cut Six Months' Costs This Sum—Brooklyn Receiver to Pay $4,000,000 of Certificates

Frank Hedley, president of the Interborough Rapid Transit Company, New York, N. Y., filed in the Federal court on Jan. 20 an answer to the suit of Clarence H. Venner for the appointment of a receiver because of failure to pay interest on a small amount of notes owned by Mr. Venner and the Continental Securities Company. Mr. Hedley said that he has opened negotiations with the Manhattan (Elevated) Railway looking to an immediate substantial reduction in the annual rental now required to be paid for the use of the elevated lines. This rental is 7 per cent on a valuation of $60,000,000, and the fact that the Interborough has spent about $50,000,000 in laying third tracks and extending the elevated lines, which lose money each year, has presented one of its difficult problems.

WHAT effect a separation of the subway and elevated system would have was described in the answer as follows:

An abrogation of the Manhattan Railway lease, as urged by the plaintiff, would inflict untold hardship upon the general public (the discontinuance of transfers at 149th Street and Third Avenue would inconvenience about 80,000 passengers daily), and the inevitable litigation over claims and counter-claims between the companies would result in substantial loss to the security holders of the defendant.

It was said that even if there should be no reduction in the net Manhattan rent and that otherwise the situation remained unchanged, the Interborough's net corporate income would be sufficient to meet capital requirements for at least three years, providing the creditors continued their forebearance.

The expected decrease in operating expenses for the six months ending June 30, 1922, was given as follows:

Decrease in wages by reason of the multiple-door control as now installed	$550,000
Decrease in wages by reason of the installation of station turnstiles	125,000
Decrease in wages by reason of the 10 per cent reduction in wages, July, 1921	1,250,000
Decrease in cost of coal at approximately $1.25 per ton	415,000
Total decrease in operating expenses compared with said period previous year	$2 340,000

These figures were given to show the gradual decrease of deficit for the last six months to a surplus of more than $19,000 in December:

Month	Net Corporate Deficit.
July, 1921	$738,967
August	605,789
September	398,203
October	126,456
November	87,465
December	*19,317

*Surplus.

Mr. Hedley also said that the company expected adequate funds for the immediate future, although no plan of financing had been devised.

The answer stated that the semi-annual interest on the first and second mortgage bonds of the Manhattan Company have been paid, along with the quarterly instalment of the dividend rental due the stockholders on Oct. 1 last; that the floating debt of the Interborough now outstanding consisted wholly of bills for materials and supplies amounting to $1,650,000 on Jan. 1, and that its credit for similar material was not impaired. On Jan. 19 the defendant, it was stated, had $2,190,000 in its treasury for current needs, and in all probability this amount would be increased to $2,500,000 by Feb. 1.

Concerning the assertion in the complaint that a receiver should be appointed for the purpose of bringing actions against certain directors because of payments of dividends, the answer stated that from the commencement of the actual railroad operations of the company in 1903 to Dec. 31, 1918, "this defendant's net corporate income from all sources amounted in the aggregate to $80,215,181, while for the same period the dividends declared and paid upon its capital stock amounted in the aggregate to $65,625,000, showing a margin of income over dividends of more than $14,000,000," and that the plaintiff accepted his share of the dividend declared on Jan. 2, 1919.

It was said that "estimates for the five-year period ending June 30, 1926, indicate that the results from operation of the subway and elevated lines will be such that, even without any reductions in the existing rental paid to the Manhattan Railway, there will accrue to this defendant a net corporate income for the period over and above all charges of approximately $6,000,000."

After a discussion of the investments of the company in its trolley lines the answer referred to the proposed plan of the Transit Commission and said:

The Transit Commission has publicly stated that it is about to issue its statutory plan for the readjustment of all New York City street railroads, including those operated by this defendant; that such plan when promulgated ought so to affect the status of this defendant as to make its position even better than as hereinbefore shown; that deponent believes that any action taken at this time looking to the appointment of such a receiver will be inimical to the public interest.

Deponent further shows that if the plan of the Transit Commission shall not be ready and in effect by Sept. 1, 1922, when the extended three-year notes of defendant mature, it is to be assumed, in view of the action of the note-holders to date, that those three-year notes will again be extended for a reasonable period, provided that in the meantime they shall not have been funded; that negotiations are under way for a plan to fund the notes, in connection with the readjustment of the rental to be paid under the Manhattan lease, and that in deponent's opinion a denial of the motion for the appointment of a receiver herein will be of great benefit to the progress of those negotiations and will be in the interest of all concerned in the affairs of this defendant.

On the same day that the Interborough matter was before the court Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, presented his application to Judge Mayer for authority to pay off and purchase $4,000,000 of receiver's certificates out of a total of $18,000,000 now outstanding and for authority to extend the remaining $14,000,000 to Feb. 1, 1923. In presenting the matter to the court the receiver pointed out that the proceeds of the certificates had been used for capital purposes in the construction and equipment of the subways under Contract No. 4 with the city of New York.

The receiver stated that due to economies in operation, to the reduced cost of materials and supplies, to a reduction in wages and to improved efficiency, the net earnings of the rapid transit lines and of the Brooklyn Rapid Transit Company had shown material improvement as a result of which the receiver was in position by payment and purchase to retire $4,000,000 of the certificates now in the hands of the public.

Mr. Garrison indicated that if net earnings continue at the present rate he expected to be able to meet future requirements in connection with subway construction out of earnings and to retire during the next year a further substantial amount of receiver's certificates. The receiver also took occasion to comment upon the splendid co-operation which he was receiving from all of the employees and the earnest efforts being made by all of them to effect economies and to render good and effective service. The receiver also pointed out that the economies in operation had been brought out without in any way lessening the service rendered to the public.

Receiver and Counsel Awarded Allowance

J. D. O'Keefe, receiver of the New Orleans Railway & Light Company, New Orleans, La., and Generes Dufour, general counsel, have been awarded $50,000 for their services rendered the insolvent during the three years of the receivership. This allowance is exclusive of $1,000 a month and $750 a month which are being paid to the receiver and general counsel since the property passed into receiver's hands.

Judge Rufus E. Foster, who made the award, explained further that the receivership of the New Orleans Railway & Light Company was a case in equity and not in bankruptcy and hence under the law governing such proceedings both the receiver and counsel are entitled to a commission as well as a salary. Compensation is a matter, Judge Foster said, entirely in the discretion of the court. The amount of further compensation is to be hereafter determined by the court and the allowance already prescribed is only a partial allowance of the court order.

The legal services performed in connection with the receivership do not include charges for the defense of damage suits, as these were handled by other law firms.

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Stock Increase Approved

The plan calling for an increase in the capital stock of the Federal Light & Traction Company, New York, N. Y., from $11,000,000 to $21,000,000 has been ratified by stockholders at a special meeting called for that purpose. The additional stock is in the form of 8 per cent cumulative preferred. The issue of 55,000 shares of common stock of no par value was also authorized to be exchanged share for share for the present outstanding common.

Authority was also given to increase from 5 to not exceeding 7½ per cent per annum the interest paid on all or any part of bonds heretofore or hereafter to be issued under the terms of the thirty-year first lien 5 per cent sinking fund mortgage securing the issue. Subsidiary companies will be permitted to issue preferred stock without subjecting them to the lien of the mortgage.

When consummated the plan will provide a medium for the payment of accumulated dividends on preferred stocks. The last payment was made on Sept. 1, 1914. Several plans have been proposed for meeting the back dividends, but no decision has thus far been reached.

City Lines to Be Segregated

The Spokane (Wash.) City Railway has been organized to take over the city lines of the Spokane & Eastern Railway & Power Company. The new corporation has been formed with a view to enabling the company to segregate property which would be pooled with the Washington Water Power Company's railway lines, in the event of a consolidation.

F. E. Connors, vice-president and general manager of the Spokane & Eastern, has denied that the new corporation was organized to represent the two operating companies. He said:

> This is a move we have had in mind for some time. It permits us to divide our properties, and we know now just what we have to consolidate.

M. W. Birkett, acting general manager of the Washington Water Power Company, denied, too, that his company was interested in the new corporation.

The corporation is capitalized for $1,500,000. It was pointed out that the capital stock would have to be increased materially if the Washington Water Power Company's properties are pooled with the traction company's properties in the new corporation, since the valuation of the joint properties would total more than $5,000,000.

Incorporators of the Spokane City Railway are F. E. Connors, Waldo G. Paine, traffic manager of the Spokane & Eastern; Elmo Edwards, auditor; J. F. Gannaway, superintendent of the Inland interurban lines; J. W. Hone, claim agent; Louis C. Ream, an accountant for the company, and J. W. Hungate, superintendent of power.

Interurban Road Ordered to Be Sold

Supreme Court Justice Leonard C. Crouch has ordered a public auction of all assets of the Syracuse & Suburban Railroad, Syracuse, N. Y., to satisfy a judgment of foreclosure for $458,722 held by the Fidelity Trust Company, Philadelphia, Pa., trustee for the holders of $400,000 of bonds of the company.

The Syracuse & Suburban Railroad was one of the first interurban roads constructed in central New York. It was built in 1899. It operated successfully for a number of years serving Fayetteville, Manlius, Orville and Jamesville. State road and automobiles caused the downfall of the company, which was forced to curtail service several years ago to meet competition and advancing costs.

The Richey Conspectus of Indexes

With this issue the monthly publication is begun in this paper of the Conspectus of Indexes, prepared by Albert S. Richey, consulting engineer, Worcester, Mass. These figures have been arranged and mailed to a limited number of electric railway officials each month during the past year, and the limited service thus given has shown itself to be so valuable that arrangements have been made by the editors of this paper for its regular publication in the form shown on this page. The table will be brought up to date and published regularly in the fourth issue of the JOURNAL each month. From time to time these tables may be supplemented by charts showing the monthly variation in one or more of the twelve indexes shown.

The indexes showing the trend of street railway wages are computed by Mr. Richey.

The index of street railway fares is the average fare in all United States cities with a population greater than 50,000, exclusive of New York City, and weighted according to population.

The index of street railway materials is based on wholesale prices of the principal commodities which enter into street railway operation, including fuel, and weighted so as to represent as nearly as practicable the trend of costs of materials used in operation.

In computing the index of street railway wages, the maximum rates per hour for conductors and motormen in both city and interurban service for all roads in the country are combined in so far as Mr. Richey is able to secure information as to changes, and weighted according to number of cars operated.

The remaining nine indexes are reprints of figures furnished by the various authorities indicated.

Unfilled steel orders are as furnished by the United States Steel Corporation. Bank Clearings and Business Failures are as shown by Bradstreet.

The National Industrial Conference Board index of cost of living is obtained by weighting retail food prices as furnished by the United States Bureau of Labor Statistics with relative prices for clothing, shelter, fuel, light and sundries as determined by the independent investigations of the National Industrial Conference Board, in the following proportion:

Food	43.1
Shelter	17.7
Clothing	13.2
Fuel	3.7
Light	1.9
Sundries	20.4

This weighting has been determined by the National Industrial Conferences Board fairly to represent the distribution of expenditures in the average workman's family in the United States.

The indexes of the *Annalist*, Bradstreet's and Dun's are based on wholesales prices in the New York City market.

All of the other indexes shown include consideration of conditions in the United States as a whole.

Conspectus of Indexes for January, 1922

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	Jan. 1922 **7.20**	Dec. 1921 **7.20**	Jan. 1921 **7.18**	May 1921 **7.24**	**4.84**
Street Railway Materials*	Dec. 1921 **159**	Nov. 1921 **158**	Dec. 1920 **213**	Sept. 1920 **247**	**100**
Street Railway Wages*	Jan. 1922 **215**	Dec. 1921 **216**	Jan. 1921 **232**	Sept. 1920 **232**	**100**
Steel Unfilled orders (Million tons)	Dec. 31 1921 **4.27**	Nov. 30 1921 **4.25**	Dec. 31 1920 **8.15**	Apr. 30 1917 **12.18**	**5.91**
U.S. Bank Clearings Outside N. Y. City (Billions)	Dec. 1921 **12.99**	Nov. 1921 **13.23**	Dec. 1920 **15.04**	March 1920 **18.54**	Av. Mo. 1913 **6.12**
Business Failures Number	Dec. 1921 **2,380**	Nov. 1921 **1,985**	Dec. 1920 **1,736**	Dec. 1920 **1,736**	Av. Mo. 1913 **1,213**
Liabilities (millions)	**76.34**	**72.30**	**96.34**	**96.34**	**24.64**

	Latest	Month Ago	Year Ago	Peak	1913
U.S. Bur. Lab. Stat. Wholesale Commodities	Dec. 1921 **149**	Nov. 1921 **149**	Dec. 1920 **189**	May 1920 **272**	**100**
Bradstreet's Wholesale Commodities	Jan. 1 1922 **11.37**	Dec. 1 1921 **11.31**	Jan. 1 1921 **12.66**	Feb. 1 1920 **20.87**	**9.21**
Dun's Wholesale Commodities	Jan. 1 1922 **164.4**	Dec. 1 1921 **164.5**	Jan. 1 1921 **198.6**	May 1 1920 **263.3**	**120.9**
Annalist Wholesale food	Jan. 14 1922 **159.9**	Dec. 17 1921 **164.2**	Jan. 15 1921 **199.9**	June 12 1920 **329.2**	**140**
U.S. Bur. Lab. Stat. Retail food	Dec. 1921 **150**	Nov. 1921 **152**	Dec. 1920 **178**	June 1920 **219**	**100**
Nat. Ind. Conf. Bd. Cost of living	Jan. 1 1922 **161.4**	Dec. 1 1921 **162.7**	Jan. 1 1921 **181.2**	July 1 1920 **204.5**	(1914) **100**

*Computed by Mr. Richey.

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Net Income of P. R. T. for 1921 $1,400,000 More than 1920 Net

The income statement of the Philadelphia (Pa.) Rapid Transit Company for the twelve months ended Dec. 31, 1921, as shown in the accompanying table, shows a net income of $1,807,293, against $382,065 for the twelve months of 1920. In its report the company states that this figure of $1,807,293 has been expended for improvements in accordance with the published plan of the management. Increased appropriations from earnings for renewal account, required in order to make necessary improvement in the condition of the property, not only used up all the moneys saved through decreased wages but in addition increased the total cost of operation by upward of $2,000,000.

It is noted in connection with the traffic of the year just ended that although the total passenger revenue increased $3,525,207, the number of passengers carried decreased 71,934,784.

	1921	1920
Operating revenue	$42,420,605	$38,807,354
Operation & taxes	31,233,589	29,195,166
Operating income	$11,187,016	$9,612,188
Non-oper. income	490,435	592,987
Gross income	$11,677,451	$10,205,175
Fixed charges	9,870,158	9,823,110
Net income	$1,807,293	$382,065

PASSENGER REVENUE

	1921	1920
January	$3,552,152	$2,987,814
February	3,140,820	2,643,356
March	3,665,426	3,110,660
April	3,559,788	3,105,643
May	3,686,930	3,306,189
June	3,485,631	3,105,463
July	3,265,138	3,042,926
August	3,199,184	2,930,081
September	3,270,195	3,026,331
October	3,542,509	3,264,455
November	3,418,544	3,656,497
December	3,728,508	3,810,203
Total	$41,514,830	$37,989,623

TOTAL PASSENGERS

	1921	1920
January	71,205,982	74,552,909
February	63,033,838	65,615,757
March	73,721,200	77,592,919
April	71,797,138	77,836,256
May	74,455,275	82,908,613
June	70,507,266	77,707,233
July	66,123,403	75,979,563
August	64,929,724	73,387,880
September	66,390,051	75,598,837
October	71,861,509	79,535,980
November	69,190,828	72,359,721
December	73,331,137	75,406,467
Total	836,547,351	908,482,135

Dallas Railway Earns More than Seven per Cent

The total gross earnings from railway operation of the Dallas (Tex.) Railway for the year 1921 were $3,143,552. Of this amount $3,027,708 was derived from passenger revenue. The total expenses amounted to $1,803,649. The railway carried 60,935,075 passengers and operated 7,533,604 car miles.

Mr. Meriwether, vice-president and general manager of the property, in announcing the accomplishments of the year just ended said that the company earned a return of 7.63 per cent on the property value. Items amounting to $70,695 were removed during the year from the property value.

Financial News Notes

Reports Net of $762,386.—The Market Street Railway, San Francisco, Cal., has reported a net revenue from railway operations of $1,779,005 for the nine months period beginning April 1, 1921. The gross income amounted to $1,353,497 and the net income realized was $762,386.

Collateral Trust Shows Surplus.—The Chicago City & Connecting Railways, Chicago, Ill., shows a gross income for 1921 of $1,418,988 against $1,442,503 for 1920. After making deductions a surplus remains of $207,955 for 1921 against $194,633 for the previous year.

No Date Set for Payment on "L" Dividend. — The Interborough Rapid Transit Company, New York, N. Y., has announced that it is not known just when the dividend on the Manhattan Railway will be paid. This payment was due on Jan. 1. By the terms of the lease under which the Interborough operates the Manhattan Elevated the lessee is given ninety days of grace in which to meet the obligation.

Middle West Dividend Increased.—The Middle West Utilities Company, Chicago, Ill., has declared a quarterly dividend of 1 per cent on the preferred stock, payable on Feb. 15 to stock of record of Jan. 31. This places the stock on a 4 per cent basis for this year as against 3 per cent for last year and is in accordance with President Samuel Insull's promise whereby the rate will be increased 1 per cent each year up to 7 per cent.

Gold Bonds Offered.—White, Weld & Company and West & Company are offering $2,590,500 of thirty-year first lien gold bonds of the Federal Light & Traction Company, New York, N. Y. The price is 91¾ and interest yielding more than 6¾ per cent. The bonds are dated March 1, 1912, and are due March 1, 1942. The purpose of the issue is to retire $1,500,000 debentures due March 1, 1922, and to fund current indebtedness.

Question of Property Rights Before Court.—Judges Thomson and Orr of the United States District Court at Pittsburgh, Pa., now have before them for decision the question of determining what part of the equipment of the Pittsburgh Railways as now operated is properly the property of the Southern Traction Company. When that matter has been settled it is expected that the first step will be announced in connection with the actual sale of the property under foreclosure.

Railway Purchased. — The Walla Walla Valley Railway, which gives electric railway service to Walla Walla, and has an interurban line from Milton to Freewater, Ore. has been purchased by the Northwestern Improvement Company, a subsidiary of the Northern Pacific Railway. The Walla Walla Company is owned by the Pacific Power & Light Company. The deal does not involve the company's power and light holdings.

Successor Company Elects Officers.—The property of the Springfield (Vt.) Electric Railway, which has been in the hands of H. H. Blanchard as receiver, has passed to the ownership of the Springfield Terminal Railway Corporation as successor. At the meeting of the stockholders of the new company on Jan. 11 these directors were elected: Charles G. Staples, Edmund R. Pratt, E. A. Davis, E. S. French and John N. Harvey. The directors organized by electing E. S. French president, E. A. Davis vice-president, and Charles G. Staples treasurer. All the directors were present except Mr. Davis.

Venner Gets Judgment.—Supreme Court Justice Burr, who some time ago heard the application in three suits by Clarence H. Venner and corporations controlled by him for judgment against the Interborough Rapid Transit Company, New York, N. Y., on the ground that the answers of the Interborough to the actions on $50,000 in notes past due were of no legal effect, granted the applications on Dec. 9. Judgments against the Interborough will be entered in accordance with the decision, but no attempt will be made to collect on them pending an appeal from the decision. The main defenses were that Venner, who has specialized in the past in suits on various grounds against the Interborough, was the real claimant in each case and that the notes due in September were also the subject of litigation in the Federal Court. The answer of the company as made in the Federal Court is referred to on page 169 in this issue.

Denver Outlook Hopeful.—In commenting on the affairs of the Denver (Col.) Tramway in its issue of Jan. 8 the Denver *Post* said: "President Stenger, as receiver, has been directing his energies and the revenues of the company toward a rehabilitation of the company in all directions, replacing obsolete rolling stock with more modern equipment and restoring the tracks in all parts of the city, until today the tramway is in better physical condition than it has been in for twenty-five years. There has been an improvement in the personnel, which is apparent in many ways, and a consequent betterment in service, which, in spite of adverse general business conditions, is attracting a larger volume of travel and a natural increase in revenues. All these factors work to the advantage of the company's securities, and the mere fact that the latter are hard to procure in a rising market is a hopeful sign that the tramway will again come into its own as one of the more important elements in the city's activities."

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Traffic and Transportation

Twelve Lines Rerouted

Chicago About to Carry Out Beeler Plan in Downtown District—Gains 11 per Cent Space

Cars in the downtown district of Chicago will be rerouted on Jan. 29 under a plan recommended by John A. Beeler, consulting engineer, some months ago. This plan was described in detail in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 26, page 938. It affects twelve of the main lines of the company and is designed to distribute traffic more equitably, allowing about 11 per cent more track capacity in that district.

To acquaint the public with the proposed changes the management will distribute several hundred thousand folders showing the changes on each of the lines. Besides a large force of uniformed supervisors will be distributed throughout the downtown territory to direct the people until they become used to the new order of things.

No action has been taken by the Illinois Commerce Commission since its order for a 5-cent fare on the Surface Lines was held up by a federal court injunction. It has been hinted that the commission will await the outcome of an appeal to the United States Supreme Court. Another suggestion is that the state body will limit the companies to a return of 6 per cent on the fixed valuation and require that the excess earnings be placed in a special fund to be used later on for reduction in the rate of fare.

The local transportation committee of the City Council is marking time on the various proposals which have been made for consolidation of the surface and elevated lines. The president of the board of local improvements recently offered to build a comprehensive system of subways by special assessment on property.

Duluth Rate Decision Delayed

Decision as to the proper permanent rate of fare for the Duluth (Minn.) Street Railway to charge will be delayed until after evidence as to the rate of return is taken in St. Paul by the State Railroad & Warehouse Commission.

In establishing a valuation, the company tried, at the hearing in Duluth, to include superseded property, such as horse cars and assets of the five companies existing before the present corporation, but was opposed. The company in its statement listed obsolete equipment and construction, including expenses of electric development and improvement, at $693,688. It also included $50,000 for uniting the system, interest cost up to $657,631, miscellaneous expenses at from $1,077,116 to $1,648,511 and a power contract, since abandoned, at $379,542.

The city is opposed to many of these figures. It will allow for all charges, exclusive of overhead expenses, a going value of $400,000. The total value placed by the company was approximately $1,509,477. Overhead expenses of the railway the city would list at about $310,709.

Must Add Cross-town Service

The Indianapolis (Ind.) Street Railway was recently ordered by the Board of Public Works to establish cross-town trolley service between Irvington and Mount Jackson, in Washington Street, operate some cross-town cars in Thirty-fourth Street, reroute College Avenue cars in the downtown district and reroute also cars on the Riverside line. Mayor Lew Shank had first sent a letter to the works board asking that the four changes be ordered.

The orders are to become effective not later than Feb. 1, the board instructed the railway company.

The Mayor suggested that at least one car each way every half hour be run through between Irvington and Mount Jackson in Washington Street. He said that eventually he wishes the railway to build a cross-town line in Twenty-ninth Street. There are no car tracks in that street now and it is not open in some blocks.

Change in Franchise Rate Sought

The South Carolina Light, Power & Railways Company, Spartanburg, S. C., is petitioning Council to order an election for a vote on the change of the franchise of the company, which is asking that the present fare of 7 cents, provided by the court under receivership, be made permanent. The company is also asking to be relieved of building the connection tracks, provided in the franchise, to Clifton No. 3 and Whitney.

There now exists a contract whereby the railway is obliged to repair those sections of the city streets between the company's tracks. This obligation is imposed upon the company in its franchise, and the South Carolina Light, Power & Railways Company sets forth in its petition that it wishes to have this franchise continued, but it asks that City Council be authorized to enter into such arrangements with the company in connection with this obligation as Council may deem most advantageous to the city's interests.

The petition asks that the maximum rate of $2 per 1,000 cu.ft. of gas now in vogue under the receivership be made permanent. George B. Tripp, receiver, refused to make any statement as to the petition.

Injunction Made Permanent

Attorney-General of Louisiana Prevented from Interfering with Collection of Eight-Cent Fare

The Federal District Court for the Eastern District of Louisiana, Judges Nathan P. Bryan of the Circuit Court, Rufus Foster of the District Court and H. D. Clayton of the District Court of Alabama, sitting en banc, on Jan. 21 made permanent the temporary restraining order issued by Judge Foster on May 20, 1920, at the request of J. D. O'Keefe, receiver of the New Orleans Railway & Light Company. This order enjoins the State's Attorney-General A. C. Coco from interfering with the company in the collection of an 8-cent fare or from bringing suit against the company in the exercise of that right.

It will be recalled that Attorney-General Coco, at the time the hearing on the petition for a permanent injunction was fixed, alleged that the matter to be solved involved a constitutional question, and at his request the temporary injunction named three federal judges to hear and determine the application for a permanent injunction.

The decision of the court was unanimous. It was announced orally by Judge P. Bryan and upheld the application for a permanent injunction, being accompanied by the declaration that the injunction restrains the Attorney-General and "not the State." The court said:

> If, by enjoining the Attorney-General, we are enjoining the State, it would be unconstitutional. We have decided we can enjoin the Attorney-General without enjoining the State. Therefore, the injunction shall be prayed for.

The decision of the district federal court as just rendered will have no special bearing on the moot question whether or not the Commission Council is a rate-making body and hence has or has not authority to enter into a conference with the railway fixing rates of fare and charging for gas and electric light and power.

This is a matter yet to be determined by the United States Circuit Court of Appeals, before which tribunal it has already been argued and submitted and a decision in which case was expected to be handed down about Jan. 9. This suit and the suit in the State Supreme Court, on appeal from the district court, are the only matters of litigation now pending in the courts in the railway tangle at New Orleans unless Attorney-General Coco should decided to prosecute the case further by taking an appeal from the Federal District Court to the State Supreme Court.

It may be stated, advisedly, however, that no steps will be taken by the Commission Council or Commissioner Maloney of the Department of Public Utilities toward reopening negotiations with the security holders of the railway, which negotiations were abruptly terminated by the Supreme Court some time ago, until the field is clear of all legal entanglements and the city can see its way toward coming to some definite and amicable solution of the matter.

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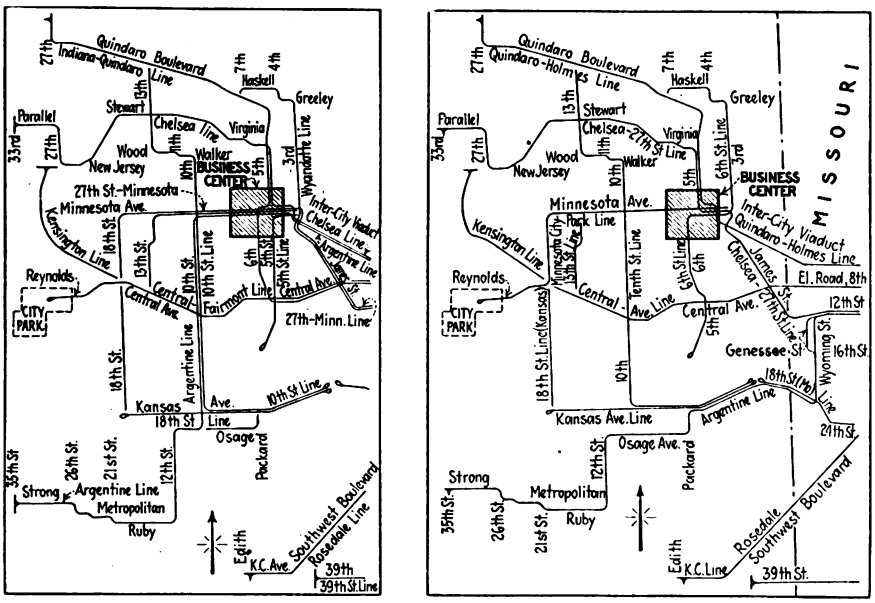
Rerouting Approved

Court Sanctions Modification of Beeler Plan for Use in Kansas City, Kan. —City Does Not Object

Judge Kimbrough Stone of the United States Circuit Court at Kansas City, Mo., responsive to an application by the receivers of the Kansas City Railways, recently issued an order establishing new routings for cars of the Kansas City Railways in Kansas City, Kan., and between the two Kansas Cities. The order came subsequent to a hearing in which representatives of the city of Kansas City, Kan., and all others interested were heard. The routings as now established are understood to be satisfactory. No objection was filed on the part of the city.



LEFT, TEMPORARY ROUTING IN EFFECT IN KANSAS CITY, KAN., IN SEPTEMBER, 1921; RIGHT, PLAN FOR PERMANENT ROUTING ADOPTED IN KANSAS CITY, KAN., IN JANUARY, 1922

The rerouting in Kansas City, Kan., has been delayed far beyond the period in which the Kansas City, Mo., reroutings were put into effect under the so-called Beeler plan. The chief obstacle to the Beeler program of rerouting in Kansas City, Kan., was the desire of every section of the city to have intercity service, complicated with the desire of the leading factors in the city to have numerous lines routed through the Kansas City, Kan., business center.

The situation of Kansas City, Kan., with reference to Kansas City, Mo., is such that about a third of the city's traffic passes Minnesota Avenue, the main business street, while bound for Kansas City, Mo. There were demands that additional lines be routed over Minnesota Avenue, which required long detours. Naturally the intercity traffic, too, was less than the local traffic, so that the demands for intercity service for all sections, could be met only with difficulty and at great expense.

Under temporary rerouting in September, 1921, six of the lines serving as many sections of Kansas City, Kan., were made intercity lines, either with terminals in the Kansas City, Mo., business district or made continuous lines serving sections of Kansas City, Mo. These six lines entered Kansas City, Mo., over three viaducts and passed through three downtown streets —two lines on each street. A seventh intercity line extended only a short distance into Kansas City, Kan., receiving passengers from Kansas lines bound for Kansas City, Mo. There was an eighth intercity line into Kansas, the Rosedale line, but this was not involved in the rerouting, as the Rosedale section is not closely connected with the other Kansas City, Kan., communities.

Operation under the temporary schedule enabled the receivers to test the expense of compliance with the the insistent demands for extensive intercity service. The receivers therefore went before the court with a showing as to the excess of expense in the elaborate service and declared that good service could be given with fewer intercity cars.

The new order eliminates two of the intercity routes and readjusts others for more direct operation, reducing the detouring. One line now passes the state line on the Intercity viaduct, entering at Sixth Street; another line uses the James Street viaduct and bridge and enters Twelfth Street; a third intercity line uses the Central Avenue viaduct, entering at Eighth Street. Only Twelfth Street has two intercity lines, its second being the Argentine, which comes now directly from the Argentine district, and no longer detours through the business section of Kansas City, Kan. The short line for transferring from Kansas lines continues to use Eighteenth Street.

The plan advanced by Mr. Beeler as in his opinion most advantageous for adoption called for concentrated service in Kansas City, Kan., with local lines radiating from the center of the business section of the city and heavy trunk line service from the center of Kansas City, Kan., to Kansas City, Mo. The idea behind this proposal was to build up Kansas City, Kan., and to give Kansas City, Kan., riders quicker and more direct service. Under the Beeler plan through riders between Kansas City, Kan., and Kansas City, Mo., would have had to transfer at the business center of Kansas City, Kan., to the trunk lines. The plan now put into effect is a compromise on this and secures about half the economies of the original proposal. The original plan would have saved about $300,000 a year, while the new plan will probably save not more than $150,000.

One-Man Cars Remain in Syracuse

On the eve of the hearing before the Public Service Commission of the demand of Syracuse, N. Y., for a reduction from the 8-cent fare and discontinuance of the use of one-man cars by the New York State Railways, Mayor Walrath reached an agreement with officials of the company for the continued use of one-man cars upon the installation of safety appliances.

Corporation Counsel Cregg, directing the fight before the commission against the fare and one-man cars, feels that this will be likely to prejudice the members of the commission against a reduction.

In a proposal submitted to the Mayor on Jan. 12, it is understood that the company definitely refused to give up the one-man cars. The terms of the proposal have not yet been made public. To provide for increased service the Mayor and officials of the company agreed that emergency control brakes and interlocking doors shall be installed.

Mayor Walrath stated shortly after the agreement had been reached that the action before the Public Service Commission for the abolition of one-man cars, might be dropped after these safety devices were installed. The proceedings were scheduled to begin on Jan. 30, but have been postponed because the railway would not have had time to demonstrate its improved service.

Both Mayor Walrath and his competitor during the campaign, came out positively against the continued use of one-man cars.

No Five-Cent Fare in Lynn

The Central Labor Union of Lynn, Mass., was recently notified by G. H. Gray, local manager of the Eastern Massachusetts Street Railway in Lynn, that it will be useless to look for a 5-cent fare until business conditions improve. He said that reductions had been made during the past year and will again be made when the company's finances permit.

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To Ask 8-Cent Fare Continuation

The Washington Railway & Electric Company, Washington, D. C., expects to ask that the present fare of 8 cents cash and five tokens for 35 cents be continued when the Public Utilities Commission begins consideration of the railways cases on Feb. 1. With the continuation of the present fare, President Ham of the Washington Railway & Electric Company is confident that the company will be able to make the necessary track extensions. He regards work on the Eleventh Street line as most important, for it would relieve congestion on Ninth Street and Georgia Avenue. According to a recent statement, this extension would accomplish better results than the commission plan which provides for a new street between Seventh and Ninth Streets north of Florida Avenues.

Discussing the future rate of fare, Mr. Ham said that while the company had several bad years, last year was a reasonably good year. At the forthcoming hearing, he said, the question for the people to decide will be whether they want the rate of fare kept down to the minimum on which the company can exist or whether they want a rate of fare that will permit of extensions and improvements to service.

Wants Ten Cents in Boise

The Boise (Idaho) Street Car Compay has applied for permission to put into effect a 10-cent rate of fare. In its financial statement supporting the application for increased rates the company states that from Jan. 1, 1921, to Dec. 31, 1921, the operating revenues amounted to $70,688 while operating expenses totaled $76,552. In this figure no allowance is made for depreciation.

The present rate is 5 cents cash with eleven-trip tickets for 50 cents. The company is now seeking a 10-cent cash fare with an eight-strip ticket for 50 cents.

Reasonable Rate of Fare Investigation Set

To determine if the rate of fare in the District of Columbia is reasonable, the Public Utilities Commission will hold public hearings beginning Feb. 1. The commission intends to investigate particularly the wages of trainmen and the necessity for track extensions.

The Capital Traction Company has a formal agreement with its men, nearly all of whom are unionized, which may be changed on March 31. Either the men or the company may open the wage agreement for revision by giving notice March 1.

The Washington Railway & Electric Company has no agreement with its trainmen, and may change the wage scale at any time. An official of the company said recently there are some union men on the W. R. & E. cars, but the company has no information as to their number.

For more than a year both street railway companies have paid their men 51, 54 and 56 cents an hour, according to length of service.

John H. Hanna, general manager and vice-president of the Capital Traction Company, said the company has not decided whether it will reopen the wage agreement in March.

Rejects Proposal to Petition for Lower Fares

The Board of Aldermen at Hartford, Conn., on Jan. 23, rejected a proposal to petition for a reduction in fare on the lines of the Connecticut Company. The vote was 13 against and 5 in favor. The report of a special committee appointed to look into the matter said in part:

> In view of the pending decision by Attorney General Daugherty as to the disposition of the lines of the Connecticut Company, it would seem that the time was not propitious to present such an appeal for the decision may change the entire aspect and promises of any appeal that might be made at this time.
>
> As the Connecticut Company has voluntarily issued new rates with a reduction of 16⅔ per cent on the present fares it would seem that any appeal made by the city might be further weakened, for the company will not have had opportunity to prove or disprove the value of the new rates.
>
> The Connecticut Company did not advance rates in proportion to the advance in the cost of running expenses, therefore, it would seem to require further time to make up the lost revenue.

This settles the question as to the matter of the city of Hartford in seeking further reductions in electric railway fares.

Service in Albany Will Be Investigated

The quantity and quality of service furnished in Albany, N. Y., by the United Traction Company is finally going to be probed by the Public Service Commission following the complaint of inadequate service and inability of one-man cars to meet traffic demands filed with the commission by Porter L. Merriman, Albany attorney. Chief Engineer Charles R. Vanneman of the commission has been ordered to investigate the complaint made by Mr. Merriman.

Similar complaints of service in Schenectady, where one-man cars have recently been installed, will soon be filed with the commission, it is understood. The United Traction Company claims that not only is the one-man car service more satisfactory to the people in general, but that the percentage of accidents is far less than it was for any given period under the two-man car system.

Wants Agreement Extended

General Manager Blinn of the Northern Ohio Traction & Light Company, Akron, Ohio, recently requested the public utilities committee of the new City Council to grant an extension of the 5-cent fare agreement. The temporary agreement between the old City Council and the traction company authorizing a 5-cent fare on the city lines expires on Feb. 1.

Prospects Not Bright in San Jose

Paul Shoup, president of the Peninsular Railway and vice-president of the San José (Cal.) Railroads, has issued a statement which explains fully the attitude of the management with respect to the applications for abandonment of service now pending before the State Railroad Commission. He said in part:

> The request for an increased rate of fare was denied and in good faith we have accepted the suggestions offered by the Railroad Commission as to ways and means of increasing the net revenue and are trying them out. The property has been and will continue to be economically managed, but in view of past experience and the fact that an adequate return has never been earned upon the investment, we have no alternative except to ask the patience of the people of San José while we try out the remedies suggested, for until the demonstration of increased earnings can be made, it is not proper to ask anybody to put more money into the property.
>
> A fair interest return is not being earned on the bonded debt nor even on the physical valuation given the property. We do not agree that this physical valuation is a true measure of the value of the property, but at this time that question is hardly before us since our earnings are so far short of a satisfactory return even upon the physical valuation given.
>
> We are now face to face with a situation where it would seem there is no hope of earning an interest return on our investments or even the interest on our bonded indebtedness. I am not at this time prepared to state what steps will be necessary, for first of all we want to follow up carefully the suggestions made in the State Railroad Commission's order.
>
> It may be that it will be necessary for the bondholders to get together in friendly conference to determine a course of action which, as has been suggested, might of course result in the properties again being separated. For the present the best thing to do is to follow the suggestions in the commission's order and measure the results when time has demonstrated them.

Omaha Case Still Before Commission

The Omaha & Council Bluffs Street Railway rate case is still before the Nebraska State Railway Commission. The railway commisioners were in Omaha during the week end Jan. 21 examining their own engineers on details of their independent original cost study. The railway continues to operate under a temporary passenger rate of 7 cents, with four tickets for 25 cents, this rate having been authorized on Aug. 10, 1920, and to continue until the commission shall have ordered a permanent rate. The commission is endeavoring to arrive at a fair valuation for rate making purposes.

New Britain Seeks Lower Fare

A petition for a 6-cent fare within the city limits of New Britain, Conn., without transfer privilege, will be made to the Public Utilities Commission at Hartford. In the petition the municipality points out that no trolley line from the city limits to the central transfer point is more than one-half mile long and that the charge made by the Connecticut Company of 10 cents for transportation from the city limits to the central transfer point is discriminatory and more than just, reasonable and adequate to provide properly for the public convenience, necessity and welfare.

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Transportation News Notes

Refuses Review of Decision. — The Public Service Commission of New York has refused the application of the Schenectady Railway for review of the decision prohibiting it from continuing its two fare charges. These charges aggregated 13 cents within the Albany city lines. The decision confined it to a single local fare of 8 cents.

Six-Cent Fare Continues in Binghamton.—Continuation of the 6-cent fare until Jan. 15, 1923, was granted by the Public Service Commission to the Binghamton (N. Y.) Railway on Jan. 19. The Binghamton City Council had previously approved the petition. William G. Phelps, receiver for the company, has promised to install fifteen additional cars.

Fewer Transfers Issued. — Since transfers on the lines of the Birmingham Railway, Light & Power Company, Birmingham, Ala., cost 2 cents they are not so popular as when they were issued free. They were given out gratis a part of the month of November, 1921, but the rest of the month they were on sale for 2 cents. In November, 1920, the number of transfers amounted to 1,507,757, against 992,842 for November, 1921.

Improves Service. — The Pacific Northwest Traction Company announces a cut in running time from Seattle to Bellingham, of 25 minutes, according to John Hickock, superintendent. This has been made possible by gearing up the coaches to a maximum speed of 65 miles, an increase of 15 miles. The company operates its interurban to Everett, connecting there with motor buses to Mt. Vernon, and from there to Bellingham by interurban.

Will Consider Changes in Ordinance. —City officials at Sacramento, Cal., and officials of the Pacific Gas & Electric Company are considering modifications in the franchise which if adopted will result in a 5-cent fare. The railway has been authorized to charge 6 cents beginning Feb. 1. The State Railroad Commission has announced that if Sacramento would agree to certain changes in the franchise and a reduction of service in the city the fare would remain at 5 cents.

Non-Transfer Service on B. R. T.— Measures have been introduced in the New York State Legislature providing for the continuance of non-transfer service on the Church Avenue line in Brooklyn of the Brooklyn Rapid Transit Company and for re-establishment of such service on two abandoned lines in the city. The bill passed last year provided for waiver of the non-transfer service for a year only, and unless the new bill is passed the company will have to abandon all service on the line.

One Man Cars Will Be Used on Extension.—One man cars will be put in operation on the Norwood line of the Birmingham Railway, Light & Power Company, Birmingham, Ala., about Feb. 1, according to the announcement of J. S. Pevear, president and general manager under the receiver. The cars are rebuilt cars and will seat thirty-six passengers. The routing of the Norwood line through the business district will be changed and shortened so that approximately four to six minutes will be saved in getting in and out of the business district.

New Publications

Life of George Westinghouse

By Henry G. Prout, C.E., A.M., LL.D. Published by Charles Scribner's Sons, New York, 375 pages. Cloth. Price $2.50.

It was most appropriate that the initiative for the preparation of this biography should have come from the A.S.M.E., which represents so many interests with which Mr. Westinghouse was concerned, such as steam railroad, electrical, power, electric railway, and marine. This society appointed a committee of eminent members to supervise the work of publication, and its choice of an author was a happy one. Colonel Prout had long been a business associate as well as a personal friend of Mr. Westinghouse, and these facts with his engineering experience of many years and his literary ability peculiarly fitted him for the task. The completed volume will not only prove absorbing to those engaged in engineering pursuits to whom the details of the work of Mr. Westinghouse are more or less familiar, but should also appeal strongly to those who know of him only as a great inventor, organizer and manufacturer. Perhaps no book for a long time has been issued which is better adapted to inspire the younger engineers to emulate the activity, courage, persistence, resourcefulness and pleasure in undertaking and solving engineering problems characteristic of Mr. Westinghouse.

The first chapter is devoted to an account of the early life of Mr. Westinghouse. Briefly, he was born in Vermont in 1846, joined the northern forces in the Civil War at the age of sixteen and one-half years and at its close entered the works for the manufacture of agricultural machinery owned by his father at Schenectady. In 1865 when nineteen years old he took out his first patent, which was to be followed by nearly four hundred others.

His later activity was so great and in so many fields that it is wisely treated in the book under review by topics rather than chronologically. Chapter II is devoted to the air brake. This was his first great invention and perhaps the one with which his name is most closely associated in the popular mind. It is interesting to note that his idea to apply compressed air to the problem of braking came from a magazine article which he read on the use of compressed air in the drilling machinery used to pierce the St. Cenis tunnel in Europe.

The electrical work of Mr. Westinghouse began in 1883 with the Stanley incandescent lamp and a direct-current generator, but realizing the possibilities in transmission of alternating current he purchased the Gaulard & Gibbs patents in 1885. This system, improved and developed by Mr. Westinghouse and his engineers, was put out first with single-phase distribution at 133 cycles and was used, of course, only for lighting. The change to sixty cycles and polyphase distribution did not come until some years later when the induction motor was developed by another of Mr. Westinghouse's engineers, Nicola Tesla.

It will be impossible here to sketch any of the other portions of the book, which include chapters on the friction draft gear, the rotary converter, the Niagara Falls installation, electric traction, steam and gas engines, the turbo-generator, signalling and interlocking and natural gas, as well as two final chapters on the personality and meaning of George Westinghouse. Throughout the volume the reader is constantly impressed not only with the possession by Mr. Westinghouse of qualities which go to make up a great inventor and successful man of affairs, but with his attractive personal traits which won for him the wholehearted loyalty and affection of all who were fortunate to be associated with him in his many enterprises.

Of his influence in the electrical industry, the best summary is perhaps given in the words of Lord Kelvin quoted in the book, namely: "The electric development we know would long have been halted without his daring and resourcefulness."

McGraw Central Station Directory and Data Book

Published annually, 1921-1922 edition issued Jan. 1, 1922, 870 pages, bound in flexible covers.

This list has been published by the McGraw organization for more than twenty-five years. The general arrangement of the book and the data given are very similar to those in the Electric Railway List, the information including statistics of the power station and distribution system, details of the city contracts showing number, size and type of lamp used and rate received, number of meters, total connected power load, whether retailing electrical goods, etc. In the current issue more than 5,000 companies furnished new reports, and altogether more than 60,000 changes were made from the preceding edition. The book is published by the Directory Department of the McGraw-Hill Company.

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Personal Mention

Mr. Feiker Continues with Department of Commerce

F. M. Feiker of the McGraw-Hill Company, publishers of the ELECTRIC RAILWAY JOURNAL, who for the past eight months has been assisting Secretary of Commerce Herbert Hoover in the reorganization of the department, has resigned. Mr. Feiker has not, however, completely severed his relations with the Secretary or the department. He has been appointed a special agent of the Bureau of Foreign and Domestic Commerce, to continue in a consulting capacity the work he has been rendering.

Last May Mr. Feiker was given leave of absence from the McGraw-Hill Company to join the Department of Commerce as a special administrative assistant of Secretary Hoover. He was selected because of his very wide knowledge of and experience and acquaintance in the American industrial field.

Under the direction of Mr. Feiker and Dr. Julius Klein, Director of the Bureau of Foreign and Domestic Commerce, the industrial and business contacts of that bureau have been enlarged, business relations with trade association committees have been established and the so-called Commodity Divisions of the bureau created. Mr. Feiker has drawn some fifty or sixty experts from the business world to the Department of Commerce to be of direct and specific service to American business. During Mr. Feiker's stay with the department "Commerce Reports," the Government's official foreign trade paper, has been changed from a daily to a weekly publication and its style and appearance completely altered more nearly to meet the needs of business. The "Survey of Current Business," a new publication destined to be of much assistance to American business men, was brought into existence. Mr. Feiker's services extended to the Bureau of Standards, the Bureau of the Census and other parts of the department. He served as editorial adviser on the department's board of editors.

C. Loomis Allen Withdraws from Railway Work

C. Loomis Allen, vice-president and general manager of the Syracuse & Suburban Railroad, Syracuse, N. Y., which is soon to be sold at auction, will enter the typewriter business, having with associates formed the E. R. Roberts Typewriter Company. He will remove from Syracuse to New York soon.

Mr. Allen organized the engineering firm of Mather & Allen in Syracuse in 1892 and was engineer for the Syracuse Rapid Transit Railway, and planned the consolidation and electrification of the present railway system in that city. He has been active at one time or another in the management of nearly every electric railway in Central New York. During the war he was for a time chairman of the American Electric Railway War Board with headquarters in Washington.

J. P. Barnes Made Bank Director

At the annual election of directors of the Citizens' Union National Bank, Louisville, Ky., probably the largest bank south of the Mason & Dixon line, James P. Barnes, president of the Louisville Railway, was elected a member of the board. This is an honor, especially in view of the fact that Mr. Barnes has been in Louisville not quite two years. Mr. Barnes was also elected a director of the Louisville Industrial Foundation recently, and is also a member of the Mayor's advisory committee, composed of leading business men and members of the business organizations of the city.

Mr. Stratton to Superintend Eastern Pennsylvania Railways

On Jan. 1 A. J. Stratton was made assistant superintendent of the Eastern Pennsylvania Railways, Pottsville, Pa., an appointment which follows his excellent work for that company since December, 1920.

Mr. Stratton's first appearance in the electric traction field was in 1912, when he became engineer of maintenance of way of the New York & Queens County Railway, New York, N. Y. His work up to that period had consisted, he says, of "buffeting around" New York. In 1915 Mr. Stratton went to the Mobile Light & Railroad Company, Mobile, Ala., as engineer, but the next year he accepted a similar position with the Binghamton (N. Y.) Railway during the reconstruction of that property.

In 1916 he transferred his activities to the northern part of the country and for two years was assistant engineer of way and structures of the Brooklyn Rapid Transit Company. In 1918 he advanced still further in his work when he became assistant engineer of the valuation department of the Metropolitan Edison Company, Reading, Pa. Since 1920 Mr. Stratton, besides his engineering work as superintendent of maintenance of way of the Eastern Pennsylvania Railways and associated lines, has acted in various engineering capacities for the J. G. White Management Corporation properties. His latest appointment is a recognition of Mr. Stratton's special merit and his grasp of details in relation to track construction problems.

E. F. Greenleaf Busy with Two Offices

Emile F. Greenleaf has been advanced recently from superintendent to general superintendent of the Orleans-Kenner Traction Company, New Orleans, La. He is carrying on the work as well of the office of president. Some time ago T. G. Bush gave up his duties as president of the company, and since then Mr. Greenleaf has been in executive charge.

Mr. Greenleaf is an experienced electric railway man. He started with the Orleans-Kenner Traction Company as right-of-way solicitor in the years before construction on the lines had been started. With the building of the railway he was given a minor position, from which he has been advanced by successive steps to his present position of general superintendent.

The office of president of the company will be filled at the meeting of the board of directors which will be held in April.

Obituary

William J. Hart died at Syracuse, N. Y., Jan. 12, after an illness of one year. Throughout his life Mr. Hart was associated with electric railways. He built the Geddes line, the first in Syracuse, which ultimately became part of the New York State Railways, and later became superintendent of the line. Other construction in which he was engaged include the electric railway lines at Saginaw, Mich., and the line connecting Detroit and Mount Clemens, Mich.

Griffen S. Ackley, well known as an inventor of brakes and brake appliances, died in Brooklyn, N. Y., Jan. 23. He had been ill since October. Mr. Ackley was famous in the history of the electric railway industry as the inventor of the Ackley No Staff Brake and the Ackley Adjustable Brake. He established the National Brake Company in Buffalo (N. Y.) in 1903. Of this company he was president until 1909, when he sold his interests and formed the Ackley Brake & Supply Corporation, with headquarters in New York City. This company handles Mr. Ackley's inventions and has branches in Germany, France and England to promote and sell his brakes. He was president of the company until his death. Mr. Ackley spent much of his time in recent years in travel, particularly in Europe, where his brakes were extensively used. He was born in Springhill, Pa., in 1851. To reach the important position which he commanded he overcame innumerable difficulties in connection with his work. His courage was limitless and carried him persistently ahead in the face of any disappointment. To his friends this tenacity of purpose was his outstanding characteristic.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

E. H. Dewson Succeeded by J. C. McCune

Of interest in electric railway circles is the recent announcement that E. H. Dewson, widely known as an authority on rapid transit problems, has retired as district engineer of the Westinghouse Traction Brake Company, in the Eastern territory, and will henceforth serve his company entirely in a consulting or advisory capacity.

Mr. Dewson has been with the Westinghouse interests since 1901, when the old Standard Brake Company was acquired by Mr. Westinghouse and moved to Wilmerding, Pa., to be known as the Standard Traction Brake Company. Mr. Dewson had been chief engineer of the Standard Brake Company, a position which he retained under the new management. Several years later the engineering departments of the several Westinghouse companies at Wilmerding were consolidated, the Standard Traction Brake Company changing to the Westinghouse Traction Brake Company and Mr. Dewson becoming assistant chief engineer of the united organization. When the district organizations of the Westinghouse Traction Brake Company were created, Mr. Dewson was named resident engineer for the Eastern district, and has since remained in this post, maintaining headquarters in New York City.

E. H. Dewson's successor as district engineer of the Westinghouse Traction Brake Company in the Eastern territory is his former assistant, Joseph C. McCune. Mr. McCune is well known as a frequent contributor of articles on air brakes in the technical press.

He joined the Westinghouse Traction Brake Company after he was graduated from Cornell University. He served through the war as an officer of engineers, acting as an instructor in the Third Officers' Training Camp at Camp Lee, Va., and later saw service in France as a member of the Expeditionary Forces. He will maintain his present headquarters in New York.

Trade Abroad During 1921

Europe is still our greatest customer and our overseas transactions with the countries of that region during 1921 considerably surpassed 1913 figures, says the Department of Commerce in a brief estimate for the year. American trade with European countries was greater by $775,000,000 in 1921 than during the pre-war year 1913. Even with the higher value of the dollar, the department declares that trade with Europe was larger than in 1913.

Of the various European countries, the United Kingdom is our best customer, while Germany has now risen to second place as a consumer of American goods. Our exports to Germany during 1921 exceeded by about $25,000,000 our exports to that country in 1913, and final 1921 figures for Germany will show an increase over 1920.

Trade between the United States and Latin America increased by 100 per cent in value during 1921 as compared with 1913. The Commerce Department estimated that trade between all the countries of Latin America and the United States amounted to $1,404,000,000 as against the total of $730,000,000 in 1913. If the trade for 1922 and succeeding years shows no decrease over 1921, it may fairly be said that on the whole we have emerged from these years of economic prices and depressions with a substantial net gain of our business with Latin America.

Bids for Electrification of Brazilian Railway

The notice for sealed bids for the electrification of the Central of Brazil Railway was published in the *Diario Official* for Nov. 27, 1921. The notice according to *Commerce Reports* for Jan. 9, calls for proposals on the electrification of stretches of the line, the operation of traction and transport material, the construction of substations, and various other improvements on this important Brazilian railway. It is quite probable, however, that a new proposal will be issued, as strong objections have been made to some of the terms of the present one.

The proposals will be received on March 30, 1922, at 1 p. m. A bond of 200 contos is exacted to guarantee the signature of the contract. Only those competitors will be considered as fit who can prove, in addition to sufficient financial capacity, that they have furnished and mounted large installations of electric traction, including installations for operation in large railway yards. In order to guarantee the execution of the contract, the bond will be raised to 500 contos of reis.

The works relating to the suburbs of Rio de Janeiro are to be concluded within a period of two years and the other works within a period of three years, both counting from the date of registry and approval by the Tribunal de Contas.

There will be three or four substations, the first being between Mangueira and S. Francisco, the second close to Deodoro, and the third or fourth between Deodoro and Belem. Thirty locomotives will be required, ten for freight and twenty for passenger trains. For the suburbs, sixty-six motor cars will be necessary, composed of sixty first-class cars and six second class; 100 second-class box cars will also be purchased. For the SS and SD trains there will be thirty-two motor cars and forty-eight box cars.

The lines to be electrified are the following: (a) The lines of the Central Station yard; (b) Eight freight lines between Central Station and the entrance of the elevated line next to the deposit of S. Diogo (1,000 meters); (c) The yard lines of the deposit of S. Diogo; (d) The lines to the Maritima Station and those of the respective yard; (e) The lines of the Central Station to the respective carhouses as well as all of the lines of this carhouse; (f) The lines to the projected station freight yard next to the Mangue Canal, as well as those of the respective yard; (g) Four main lines from the beginning of the elevated line next to the deposit of S. Diogo up to the Engenho de Dentro Station (10,070 meters); (i) Two main lines from the Deodoro Station to Belem, on the line from Centro, and that of Santa Cruz on the Santa Cruz branch (39,468 meters and 32,544 meters); (j) A line between Belem Station and the Paracamby Station (8,306 meters); (k) The circular lines from D. Clara Bangu and Matadouro; (l) The line from the Deodoro Station to the carhouse, cleaning and repair of rolling stock, as well as all the lines belonging to this installation.

Automatic Substation Equipment for Portland, Ore.

One of the largest single orders for automatic railway substation equipment placed in this country is announced by the General Electric Company for the Oregon Electric Railway, Portland, Ore., which will result in making entirely automatic (with the exception of one station in the city of Portland) the operation of the 180 miles of track on this road.

The order comprises automatic control for seven synchronous converter substations, replacing the present manual control which has been in operation since 1912. The stations to be changed over are at Moffett, Tonquin, Pirtle, Lassen, Waconda, Cartmey and Orville. At Moffett and Tonquin there are two 500-kw., 600-volt converters connected in series giving 1,000 kw. at 1,200 volts for each. The remaining five stations have single-unit, 500-kw., 1,200-volt converters installed.

The automatic control will include the General Electric Company's standard practice of separate excitation of the converters to insure correct polarity at starting. Designed along standard lines for present railway practice, the equipment at each station will consist essentially of a motor-driven drum controller, exciter, contactors, switches and relays with protective devices and load limiting resistors. The exciter, which is operated by the same motor as the controller, will provide the separate excitation. The stations will be connected to the line or shut down in

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accordance with the power demands from cars on the lines.

The Oregon Electric Railway, an interurban line owned by the Spokane, Seattle & Portland Railway, is operated at 1,200 volts direct current stepped down from a transmission line voltage of 60,000 at 33 cycles. The present rolling stock consists of sixty-two motor cars, twenty-eight trailers and ten 50 to 60 ton freight locomotives. There are 154 miles of route on the system.

Window Glass Prices Reduced

Electric railways will be able to buy window glass cheaper as a result of a price war between importers and American glass manufacturers. General price cuts were announced during the week closing Jan. 21 by the American Window Glass Company, manufacturing probably one-third of the country's output of window glass. The reduction aggregated 22 per cent, and doubtless will remain operative until a protective tariff schedule can be worked out to give adequate protection to American glass industries.

The price reduction on very small sizes of single strength window glass, averaging twenty-five united inches, upon which competition was keenest, was approximately 31 per cent. On sizes a little larger, on which competition was not so keen, the reduction worked out to about 23½ per cent, and on the larger sizes, where competition up to the present time has not been so great a factor, the cut was made at 20 per cent. The average reduction was about 22 per cent.

These price reductions resulted in an immediate change in discounts on jobbers' lists here, when the new discounts on single strength A quality window glass became 84 per cent to 87 per cent, depending upon sizes, and on single strength B quality, 85 per cent to 88 per cent. The new discount off jobbers' lists on double strength A quality window glass is 85 per cent, and on B quality 87 per cent.

Manufacturers having taken this step are not thought likely to return to the former price level so that consumers of window glass may consider the cut permanent, at least as far as the first half of the current year is concerned.

Metal, Coal and Material Prices

Metals—New York	Jan. 24, 1922
Copper, electrolytic, cents per lb.	13.50
Copper wire base, cents per lb.	15.12½
Lead, cents per lb.	4.70
Zinc, cents per lb.	4.61
Tin Straits, cents per lb.	31.37½
Bituminous Coal, f.o.b. Miners	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.70
Somerest mine run, Boston, net tons	1.80
Pittsburgh, mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	2.05
Central, Ill., screenings, Chicago, net tons	1.72
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, New York, cents per lb.	6.50
Weatherproof wire base, N. Y., cents per lb.	16.25
Cement, Chicago consumers net prices, without bags	1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	76.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	92.00

Rolling Stock

The Glendale & Montrose Railway, Glendale, Cal., has placed in service one standard safety car, manufactured by the American Car Company.

The Southwestern Gas & Electric Company, Texarkana, Ark., reports the purchase of two standard safety cars from the National Safety Car & Equipment Company.

Chicago (Ill.) Surface Lines was reported in an unconfirmed daily press dispatch late on Jan. 26 as having suffered a loss of $2,000,000 in the distruction by fire that day of a North side carhouse and part of its rolling stock equipment.

The San Francisco-Oakland Terminal Railways, Oakland, Cal., has constructed one closed steel motor car for city service, in its own shop. This car is 48 ft. 6 in. long and has a seating capacity of fifty-two.

Toledo & Western Railroad, Toledo, Ohio, has ordered through its receivers three new light cars for suburban traffic. The new cars are to weigh twelve tons instead of thirty tons as the old equipment did.

United Electric Railways, Providence, R. I., has ordered a sufficient number of one-man cars to begin running an eight-trip-an-hour schedule instead of the present six-trip schedule on the Elmwood-Chalkstone Avenue line.

Track and Roadway

Fresno (Cal.) Traction Company has started on the work of lowering its tracks to the street grade on Olive Avenue. These tracks are to be lowered approximately eighteen inches.

Cultus Lake, B. C.—The development of extensive timber limits in this vicinity will necessitate the building of 5 miles of electric railway connecting with the British Columbia Electric Railway's Fraser Valley line near Sardis.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill., will be extended from Carbondale to Herrin. Five hundred citizens of Herrin have subscribed $100,000 for this extension. Work will be begun next spring and service started in the fall of 1922.

Los Angeles (Cal.) Railway is rebuilding Third Street between Gramecy Place and Norton on the West Sixth Street line. Work is also under way at Vermont and West Sixteenth where on account of the opening of West Sixteenth Street it is necessary to lower the tracks.

Power Houses, Shops and Buildings

New Orleans Railway & Light Company, New Orleans, La., through D. P. O'Keefe, receiver, and A. L. Kempster, general manager, is proceeding with extensive additions to its power plant and distributing systems, including the installation of a 20,000-kw. turbine and auxiliaries.

Los Angeles (Cal.) Railway put its automatic substation at Garvanza Avenue near York Boulevard into service on Jan. 1.

Portland Railway, Light & Power Company, Portland, Ore., has completed work of laying foundations at the Sellwood carhouse for the erection of two steel towers for sprinkler tanks, to replace the wooden tanks now in use. The towers will be 75 ft. high and the tanks will have 50,000 gal. capacity. Between 36 and 40 tons of steel will be required, which is being fabricated in Portland.

Trade Notes

J. T. R. Bell, who for the past five years has been general sales manager of the Gurney Ball Bearing Company, Jamestown, N. Y., has resigned from that company and will take up the manufacture of a new type of anti-friction bearing.

Rome Wire Company, Rome, N. Y., has opened district sales offices in New York City at 50 Church Street. H. S. Hammond, who has represented the company in the Eastern territory for the past twenty years, has been placed in charge of this new office.

The C. H. Wheeler Manufacturing Company, Philadelphia, Pa., announces that H. W. Cross, formerly with the General Electric Company, has now assumed the management of its New England office, with headquarters at 53 State Street, Boston, Mass.

Combustion Engineering Corporation-George J. Hagan Company, Pittsburgh, Pa., announces that the Hagan Company has discontinued representation of the Combustion Engineering Corporation. The Combustion Engineering Corporation has opened its own office in the First National Bank Building, Pittsburgh, Pa., and will soon open an office in Cleveland, both of which will be in charge of W. C. Stripe, former manager of the Philadelphia office. The George J. Hagan Company will retain the exclusive agency for the type "H" stoker, formerly known as the American stoker, for use in Hagan Industrial Furnaces.

New Advertising Literature

The Elliott Address-Press, New York, N. Y., has issued a folder describing the advantages of using its Address Cards and Address-Press for mailing information which will go to the same person at successive intervals.

The Cutter Company, Philadelphia, Pa., has issued a thirty-six-page booklet describing in considerable detail various types of steel box mountings for its I-T-E circuit breakers. Various other details in regard to satisfactory mounting and use of these circuit breakers are also given.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

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Volume 59 — New York, Saturday, February 4, 1922 — *Number* 5

C. E. R. A. Engineering Council Has Made Good Start

THE close of a very good year and the start of a promising new year were marked by the annual meeting of the Central Electric Railway Association last week. Perhaps the outstanding accomplishment under the administration of President A. C. Blinn was the actual inauguration of the long-talked of meetings exclusively for the engineers of the central territory. Similarly, one of the important things that will probably be accomplished under the capable leadership of President S. W. Greenland is the completion of the organization and scheme of procedure of the council. The important thing this past year was to get the engineers' meetings started. This has been done, and the several local section meetings and the one general session held have served to stimulate a healthy and instructive expression of experience and opinion on pertinent questions confronting the engineers.

However, there must still be some system planned whereby the discussion of each section may be brought down to definite conclusions, the conclusions of the several local sections on a subject studied jointly, and a final report drawn by a standards committee of the council, or some such body, looking toward the formulation of definite "recommended practices" or "standards" of construction based on the consensus of thought of all the engineers of the central territory. This is the thing that remains to be done to make the Engineering Council the success that it was hoped it would be. In some such way there must be avoided the repeated discussion of the same topic with divergence of views always in evidence and without making any noticeable headway. The local section meetings have already proved their worth in their stimulation of new ideas, and if a plan can be formulated now so that the meetings will be "getting somewhere" in addition to just discussing problems, the idea of the Engineering Council will have been made completely successful. This task falls in the main to the willing hands of President Greenland and second Vice-President Harry Reid, who is ex officio chairman of the Engineering Council. The chairmen of the local sections appointed during the latter part of last year will be continued through this year according to the general understanding—a further assurance of success.

Another Summer Cruise for C. E. R. A. Members

WHEN anything has been as completely enjoyed by all in attendance and has afforded as perfect a setting for a convention as the Great Lakes cruises of the Central Electric Railway Association, it was only to be expected that the association would unanimously indorse a repetition next summer. The boat trip really is a great event for this association. It affords a degree of pleasure and absolute isolation from the heavy cares of the year that can be gained in no other way. And more important, perhaps, this rest and leisure, in company with many other railway men, furnishes an opportunity for discussion of common problems or exchange of ideas and advice that is of inestimable value to the companies. Furthermore, the business program of the convention is just enough of serious purpose to keep one from forgetting altogether the work left behind that must be returned to.

So make a mental reservation now for a few days' engagement off the job at the end of June, for you will find it "the most delightful event of the year." And as usual, the association will be glad to include in the party railway men from any part of the country.

Why Eliminate Waste? Why Standardize?

LAST fall the Federated American Engineering Societies issued a committee report on the elimination of waste. If this report has caused any reaction in the electric railway field the editors of this paper have, unfortunately, seen no evidence thereof. But even though there was no specific reference to the electric railway industry, even though there was apparently no direct appeal to electric railway men, there stood out from the report for those who would see a real message, a big idea, in conservation of man power and materials for all industry. (See review of this report, ELECTRIC RAILWAY JOURNAL, Nov. 17, 1921, page 1152.)

There have been some who, lately, have seen in this report a false indictment of management. That, it appears, is a rather distorted view of the purport of the report. Rather there appears on close study an analysis, a portrayal, of what management, with its brains, can do to eliminate many of the wasteful practices of American industry—whether it be in the use of man power, of materials, of methods, or what not. There are as plainly pointed out opportunities of labor to assist in a constructive program of getting things done in a more effective order.

But the report is fundamentally the striking evidence of a broad constructive policy for the benefit of American business and American men and women. To becloud the main issue is, as one noted engineer has said, a "dis-service" to the nation.

There are two main concrete suggestions which electric railway men can get from a close study of this report. One of these is how to analyze their own work to see how to eliminate whatever waste exists. This can be learned from a study of the way in which the six "test industries" were analyzed. The other is how best to approach the problem of standardization; in other words, what standardization really means.

These two subjects, the elimination of waste and the adaptation of the principle of standardization—so far as practicable—in American industry, are the two most potent factors for the maintenance or increase in the present American standard of living. If man's effort, by reduction of lost motion, is increased 25 to 30 per

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cent, he and his fellows benefit directly in proportion. If capital invested in finished product for the market is called upon to maintain a smaller number of types, it can automatically expand its usefulness.

Standard Specifications Would Appear to Benefit Everybody Concerned

IT HAS been generally taken for granted that when a group of competent engineers or others get up a set of specifications for a material, a device or a process commonly used they have accomplished something. That this assumption is warranted can be seen from a moment's consideration. Obviously the product of their deliberations is the result of the best thought and experience available. The thing or practice specified must, therefore, be better than the average thing or practice in use. If the specification is generally adopted the result will be a money saving. But if there is a failure to adopt a standard, it is partly a reflection upon the competency of the framers thereof.

In a recent number of the "Question Box," published monthly in *Aera* by the American Association, a topic raised for discussion was the desirability of standardizing small track supplies, such as bolts, spikes, nut locks, etc. A surprising result was the statement by several experienced railway men that such standardization is undesirable. In the opposite belief this paper in 1920 secured from Howard H. George, and published, a series of specifications of track details with technical explanations. The series was well received and was believed partly to fill a long-felt need. The Engineering Association committee on way matters has for years had the standardizing of these details under consideration and will, it is hoped, in due course make some definite recommendations. The result will be a better grade of supplies at the same or lower cost.

Of course, the principal valid objection to standardization is that it will stop progress. This means that it should be attempted only when it does not prevent real development. Legitimate standardization, therefore, is synonymous with judicious standardization, which in turn means applying common sense to it.

Even in New York Traction Conditions Are Improving

THE electric railway fare situation in New York City has long been recognized as the worst among the large cities in the country. No increase in fare has been permitted except that of a charge of 2 cents for transfers on the surface lines. But developments during the past week indicate that conditions are improving, even though the new Transit Commission has not yet had an opportunity to conclude its investigation and recommend a remedy. Of course, the companies cannot be considered yet as prosperous. It is not a sign of affluence for a man to be bankrupt but able to work off a portion of his debt, or for one who is nearly bankrupt to say that he thinks now that he can take care of his notes when they become due. But even these conditions are better than those of but a short time ago. The result has been brought about by economies and reduced costs of materials and labor, plus, in the case of the surface lines, a virtual increase in fare, brought about by the break-up of the lines.

Coincident with this comes the discovery by a legislative committee appointed to investigate taxes that the utilities are the most heavily taxed of any kind of industry, and the electric railways the most heavily taxed of any utility. In fact, at present, some electric railways which otherwise would show a profit are being asked to pay not only all of their net earnings, but two, three and four times that sum as taxes, and it was found that the taxes on electric railways are nearly four times as great as the corresponding taxes on manufacturing companies. If local real estate taxes are taken into account, electric railways in New York State operating at a profit pay some 44 per cent of their net income in state and local taxes. It seems that it is necessary only to call attention to this situation in order to bring about a reform; another sign that conditions are better.

Boston Makes a Remarkable Showing

ONE of the first annual reports to appear this year is the earnings statement of the Boston Elevated Railway. It is a mighty encouraging document. It speaks wonders for the management of that property and bears out in large degree the prediction in the ELECTRIC RAILWAY JOURNAL about a year ago that in the period of post-war deflation the electric railways would most likely come into their own again. This is said advisedly, of course, for many companies are still sorely beset, but even the most hardened pessimist cannot but marvel over the showing at Boston.

It will be recalled that at the end of the first year of operation of the road under the public trustees an operating deficit of about $5,000,000 had accumulated. During this time a 5, then a 7 and finally an 8-cent fare was in force. This accumulated deficit was met from the reserve fund and by general taxation in the cities and towns served by the railway. In the second year, with a flat 10-cent fare in force, the revenues practically met expenses. In the calendar year just closed receipts exceeded expenditures by about $1,117,000. The basic fare at Boston is still 10 cents, but the number of lines being operated at 5 cents is being increased constantly. Few suburban centers now remain in metropolitan Boston where it is not possible to ride within the local community for a 5-cent fare.

The trustees of the company are, of course, elated. They have every right to be. But they warn the public that under the provisions of the public control act the general 10-cent fare cannot be replaced by a lower fare until repayment has been made to the cities and towns of the amounts advanced by them to meet the deficits of the first year of public operation. In looking ahead, however, the trustees see on July 1 next prospects of surplus receipts of about $500,000 after the payment of the balance due the reserve fund. Under the statute this surplus must be used in reimbursing the cities and towns for the advances they made in meeting the previous deficits. The prospects would therefore seem bright of paying off the balance of the loan in 1923.

A particularly pleasing feature of the matter is the acknowledgment which this wonderful showing by the management has received in the daily press. In the dark days when the deficit was piling up the tendency of the press was anything but lenient, but General Manager Dana and his associates, ridiculed, sneered at and at times vilified, have, as the Boston *Post* says, come through with a very satisfactory record. Much still remains to be done. Of this Mr. Dana and the trustees are cognizant, but the fact remains that the showing for 1921 is in many respects a truly remarkable one.

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The California Resolutions Regarding "Bus Transportation"

LAST WEEK the California Electric Railway Association adopted the resolution reprinted herewith and distributed it quite widely throughout the electric railway industry of the entire country.

To the editors of ELECTRIC RAILWAY JOURNAL and BUS TRANSPORTATION, the action taken by these leading and influential electric railway officials of California indicates two outstanding points, though possibly not of equal importance. The first of these is that there is a critical and fundamental problem facing the electric railway industry today in this question of the bus and just as critical and fundamental a problem facing the bus transportation industry. The other point is that the California men, who have been acquainted for years with the purposes and policies of ELECTRIC RAILWAY JOURNAL, have misconstrued or have gained an entire misconception of the facts and purposes connected with the starting of BUS TRANSPORTATION.

There is perhaps a special reason why men from California should take a viewpoint apparently so at variance with many, if not most, others. Competition between rail and bus is more bitter in California than anywhere else because of the large number of automobiles, the wonderful climate, the long, smooth, improved—and inviting—highways, and also because of the recognized injustice of jitney competition in the early days. It will be recalled that the advent of the "jitney" is credited to Los Angeles on July 1, 1914. Since that time, in a period when the population of Los Angeles has doubled and the traffic increase would normally, according to past history, be fourfold, the number of street car riders has not materially increased. With a situation so tense and at a time so critical, it can be understood that California railway companies might not take the broadest view of the situation.

But it is not in California alone that there is a problem. Everywhere in this country electric railway operators are confronted with transportation problems in which the possible place of highway transportation has an important bearing. Opinions on the bus by railway men vary from a real and growing application in both rail and non-rail territory to an uncompromising position of demanding that the word "bus" and all that it stands for be relegated to innocuous desuetude. In the eyes of many—and with this group the editors of these two papers agree—the latter attitude is one in which personal prejudice has overcome sound judgment. But that a real problem exists before the railway industry as a whole in determining its attitude toward the bus is very apparent. It is to be hoped that the industry itself will not break up its present wonderful co-operation and united effort on its common problems. But views do vary on the question and discussions on the bus are becoming more and more frequent. The American Association devoted a session of its 1920 convention to the subject; the New England Street Railway Club on Feb. 2 discussed the bus most fully, and it is both timely and fortunate that the American Electric Railway Association has placed the bus at the top of its program for the Indianapolis Midyear Conference on Feb. 28.

Resolution of California Electric Railway Association Regarding the Publication of "Bus Transportation" by the "Electric Railway Journal"

Whereas, the ELECTRIC RAILWAY JOURNAL has been supported by the electric railway industry of the United States and the co-operation of such industry and the manufacturers of electric railway supplies and equipment has made it possible for such JOURNAL to continue and be recognized substantially as the official mouthpiece of the electric railways in this country; and

Whereas, the publishers of said ELECTRIC RAILWAY JOURNAL have seen fit to foster as a part of their enterprise, a publication to be known as BUS TRANSPORTATION, dealing largely with the automobile industry in the United States, and, particularly, with reference to gasoline propelled motor vehicles carrying passengers and freight for hire in direct and unfair competition with the electric railway carriers of the country; and

Whereas, the result of such publication will be unfavorable to the interests of the electric railways of this country; now, therefore

Be It Resolved by the California Electric Railway Association and the undersigned members of such Association, that the action of the publishers of said ELECTRIC RAILWAY JOURNAL in starting said automobile publication is not to the best interests of the electric railways of the United States, and this Association and its members are resentful of said action and the support so given by the publishers of said ELECTRIC RAILWAY JOURNAL.

CALIFORNIA ELECTRIC RAILWAY ASSOCIATION,
By W. R. ALBERGER, President.
W. V. HILL, Manager.

LOS ANGELES RAILWAY CORPORATION, By W. E. DUNN, V. P.
SAN DIEGO ELECTRIC RAILWAY CO., By W. CLAYTON, V. P.
SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS, By W. R. ALBERGER, V. P.
MARKET STREET RAILWAY CO., By WM. VON PHUL, PRES.
PACIFIC ELECTRIC RAILWAY CO., By D. W. PONTIUS, V. P.
SOUTHERN PACIFIC COMPANY, By PAUL SHOUP, V. P.
PACIFIC GAS & ELECTRIC COMPANY, By P. M. DOWNING, V. P.
BAKERSFIELD & KERN ELECTRIC RAILWAY, By A. G. WISHON, G. M.
SACRAMENTO NORTHERN RAILROAD, By GEO. F. DETRICK, PRES.
SAN FRANCISCO-SACRAMENTO RAILROAD COMPANY, By H. A. MITCHELL, V. P.
PENINSULAR RAILWAY COMPANY, By F. E. CHAPIN, G. M.
SAN JOSE RAILROADS, By F. E. CHAPIN, G. M.
CENTRAL CALIFORNIA TRACTION CO., By F. W. WEBSTER, G. M.
STOCKTON ELECTRIC RAILROAD CO., By F. W. WEBSTER, G. M.
FRESNO TRACTION COMPANY, By F. W. WEBSTER, G. M.
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PETALUMA & SANTA ROSA RAILROAD COMPANY, By E. H. MAGGARD, V. P.
SANTA BARBARA & SUBURBAN RAILWAY, By W. A. BRACKENRIDGE, PRES.
UNION TRACTION COMPANY, By S. W. COLEMAN, PRES.
SAN DIEGO & ARIZONA RAILROAD CO., By A. T. MERCIER, G. M.
NORTHWESTERN PACIFIC RAILROAD COMPANY, By W. S. PALMER, PRES.

San Francisco, California.
January 23, 1922.

Why We Started "Bus Transportation"

As to the second point emphasized by this resolution, the editors have no desire to quarrel with their long-time friends from California, nor do they suppose these friends desire to quarrel with them. But there is evidently an honest lack of understanding of the facts and purposes concerning BUS TRANSPORTATION. To start with, it should be emphasized that it was with a definite desire to be of even greater service to the electric railways and at the same time to render a service to those in the bus transportation business who have a real purpose of public service as their guiding motive that BUS TRANSPORTATION was started. The editors of ELECTRIC RAILWAY JOURNAL appreciate the compliment in the first paragraph of the resolution as to the position which the JOURNAL has been privileged to occupy in the industry and trust that it has rendered a real service. BUS TRANSPORTATION is merely an extension of that service in response to a very evident demand.

While ELECTRIC RAILWAY JOURNAL is an inde-

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pendent and not an official publication, it developed as a part and product of the industry and with the benefit of the thinking and advice of the leading men in the industry. In the same spirit, and as the same sort of outgrowth of the transportation industry, BUS TRANSPORTATION has been naturally developed. In other words, BUS TRANSPORTATION is published not because the McGraw-Hill Company or its editors alone believed it to be sound for the industry, but because the electric railway men themselves, as a group, and the leading figures of the bus transportation industry have developed their own thinking to the point of desiring such a publication by a responsible organization which will emphasize the sound principles of the transportation business.

BUS TRANSPORTATION is not a publication "dealing largely with the automobile industry in the United States, and particularly with reference to gasoline-propelled motor vehicles carrying passengers and freight for hire in direct and unfair competition with the electric railway carriers of the country," but is rather one dealing with the transportation industry as to the proper application of highway vehicles to the transportation of passengers in urban and interurban areas in co-ordination and co-operation with such existing transportation agencies as may be operating in those areas. The policy of the paper is to foster unified operation in any given area and to deprecate and show the folly of the unfair and unregulated competition which has existed in many places.

Briefly, the editors of ELECTRIC RAILWAY JOURNAL have been for some time presenting bus information in the JOURNAL columns and, while this was in response to reader demand and to the signs of the times, it was limiting the strictly railway service which could be rendered and at the same time limited the bus information which could be supplied. Furthermore, it did not and could not adequately reach the independent bus transportation men who wanted a transportation publication. To start a separate publication seemed, after much careful study, to be the best solution. Many leaders of the electric railway industry were consulted as were also leading bus men. Those whose views were obtained were unanimous in commending the new undertaking, with the exception of one of the leading Pacific Coast representatives, whose comment, however, was not received until nearly Jan. 1, more than two months after the preliminary announcement on Oct. 29. Letters from many of these men were printed in the ELECTRIC RAILWAY JOURNAL in the issues of Dec. 10 and Dec. 31.

The publication of BUS TRANSPORTATION was thus undertaken with the apparent encouragement of most of those who would be interested and in the desire to render real service. There was no illusion regarding making money with the new venture, for some time to come, at least. BUS TRANSPORTATION was issued as a section to ELECTRIC RAILWAY JOURNAL to JOURNAL subscribers because it was felt that subscribers whose subscriptions had not expired should continue to have the bus information service, if they desired, without additional payment for the rest of the subscription term. That the offer has been appreciated and BUS TRANSPORTATION apparently desired is indicated by the fact that more than one-third of the JOURNAL subscribers have requested and are receiving it on that basis. While that arrangement has advantages, also, from a postal standpoint in convenience and cost of mailing, these advantages are less important than any misconception of purpose and it can easily be arranged to do what some Californians since the adoption of the resolution have suggested, namely, to "divorce" the two publications so that there will be no doubt that each stands on its own feet. This does not mean any change in staff or management, of course, nor of editorial policy, for, as the editors see it, there is only one sound policy which is possible. If the same company can operate buses and cars satisfactorily or the same interests operate steam and electric railroads with fairness to the public, it is hard to see why the same publishing company cannot properly issue a bus transportation paper and an electric railway paper.

It is gratifying to the editors, in the viewpoint they have taken, to find that the sentiment in the Central and Eastern territories, so far as it can be learned within the last four days or since they have had knowledge of the resolution, is still in accord with the move which has been made. Comments have come to the editors during this time to indicate that the expressions of opinion shown Dec. 10 and 31 are unchanged and that BUS TRANSPORTATION is performing a real service.

There should be no doubt of purpose or fact. BUS TRANSPORTATION is published to help in finding the solution of the question: where does the bus fit in. By portrayal of fact, by encouragement of good transportation practice, by dissemination of information and by support of proper regulation and co-ordination of bus transportation services, the editors hope to render such service to both independent bus operators and railway men, whether or not active in bus operation, that the attitude of California railway men will be changed and that BUS TRANSPORTATION will be recognized everywhere as the constructive agent it is intended to be.

A Purpose Clearly Defined Is Already Half Accomplished

A LARGE part of the constructive thinking of the electric railway industry comes to a head in committee work—on the properties and in the local and national associations. To be effective this thinking must be well directed, otherwise, as has been aptly said, the result will be like that from trying to operate on a track a car with flangeless wheels.

The best corrective of aimless thinking is definition. This applies to the thinking of the individual, but especially to a group, like a committee, which is trying to think in unison. This point was raised in an editorial in the issue of this paper for June 18, 1921, under the caption "The Function of Every Committee Should Be Clearly Defined." The point is reiterated now because committee activities are well under way and the committees are endeavoring to "find themselves." It would be a profitable exercise for every member of every committee to put into from ten to twenty-five words the gist of what he believes his committee ought to accomplish this year. The definitions of all members of a committee could be combined and a composite picture of the purpose would be produced. If this were done, a greatly improved quality of production would result, as compared with what is possible with less aimful planning.

One of the committees recently devoted a well-attended all-day meeting to the job of putting into crisp form the items which seemed to demand attention according to the specifications of the executive committee. The time was well spent.

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Governor Miller Believes A 5-Cent Fare Possible

IN A NOTABLE address on traction affairs before the Merchants' Association in New York City last week, Governor Miller declared that in his judgment the 5-cent fare in New York "can and will be preserved." This statement was made in a constructive way. The Governor explained at length that people could not get something for nothing and could not be carried for less than the cost for their transportation, including a proper return on the honest capital. But he expressed the belief that by the "elimination of unnecessary waste and costs you can preserve, in all probability, the 5-cent fare."

All will approve of Governor Miller's courageous attitude in dealing with the traction situation in New York, but the question of a proper fare for such a large city as New York, with its constantly increasing demands for more transportation, is a very big one. Broadly speaking, there are two ways of establishing in any community a fare based on cost of service. One is first to decide upon the fare and then to adjust the service so that it can be supplied for that fare. The other is first to determine the quality of service desired and then to set the fare so as to cover the cost of that service. Of course, there are practical limitations to the extent to which each plan can be followed. Too low a fare may compel so poor a service as to discourage traffic, while too elaborate a service may also drive away traffic because it will mean a fare so high as to warrant only necessity riding. Besides comfort and frequency of cars, the cost of railway service depends, of course, upon a large number of other factors such as length of ride, amount of taxes and other burdens assessed against the companies, traffic regulation and other matters largely within the control of the authorities, or a lower fare than would otherwise be possible may be obtained through the payment by the city of a subsidy in some form.

Tradition in New York, perhaps to a greater extent than in any other city, calls for a flat fare of 5 cents on the rapid transit lines, as well as on the surface lines in Manhattan where the passenger does not change cars. While there are many arguments from the standpoint of the city against a flat fare—such as that it discourages the development of various community centers—it would probably be very difficult from a political standpoint in New York to make a change from it to a distance fare, especially on the rapid transit lines. Nevertheless, one idea long held in New York about the flat fare has disappeared, *i.e.*, that 5 cents should carry a passenger on the surface lines from any point to any other point in the same borough, and there is of course no precedent of a 5-cent fare to cover a transfer between rapid transit and surface lines, except to a very limited extent in the Borough of Brooklyn, and this has now been abandoned.

In other words, circumstances have brought around in New York City, except on the rapid transit lines, a kind of crude distance fare, and it is probably owing to this fact more than to any other that the surface lines in New York have been able to get along as well as they have during the last few years on a 5-cent fare. Theoretically, this fare may be highly discriminatory in regard to the distance which a person can ride on different lines for 5 cents. Practically, the discrimination is not so great as appears at first sight, because the speed of the surface cars is so much slower than that on the rapid transit lines that long rides on the surface system are the exception. Governor Miller did not specify in his address whether he thought his proposed flat fare should include universal transfers, between the rapid transit and surface lines, for instance. If this should be in contemplation, it would be a step backward. Such a universal fare would undoubtedly have to be higher than if such transfers were not given and hence would discourage short riding on the surface lines. During the last few years persons have not only become accustomed to paying for a transfer, but such a charge can be justified on the ground that, other things being equal, it costs more to transport a passenger who makes a transfer from one car to another than one who does not. Whatever fare system is adopted in New York City as a result of the present inquiry, an effort should be made to preserve as much of the distance fare characteristics as possible.

Association Membership Appeal Based on Both Self-Interest and Loyalty

WHY should the membership of the American Electric Railway Association support the 1922 campaign for more members, which is about to be launched? There are many reasons, but particularly two: First, the larger the association the more will each present member get out of it; second, the industry needs to have everybody in its association if it is to present a united front.

And what can the present members tell the "prospects" as to reasons for getting out of the "prospect" class? There are plenty of them and they can be divided into two groups, namely, the self-interest appeals and the loyalty appeals. Of the former the most forceful is the service which the association renders in the way of information, and to the value of which the present members can testify. This can readily be shown to be worth all that membership costs, provided that the members make use of their privileges. Again, the adequate preservation of any business depends to some extent upon all of its constituents standing together, and the association is the agency through which the electric railway industry can obtain this unity of action. This might be called the self-preservation appeal. There is also a certain prestige which goes with membership in a national association, and this prestige is proportionately greater with the small companies than the large ones.

This act of standing together has an element of loyalty also. Whether the potential usefulness of the association is capitalized or not, there is a natural feeling on the part of individuals and corporation managements that their industry needs their support. They want to be a part of any co-operative effort which the others think worth while. Of course if they do not realize that they are part of an industry, then they must first be convinced of the soundness of the idea.

This year's committee on company and associate membership plans a canvass more comprehensive than any previously undertaken among the railway, manufacturing and allied interests. The temper of the meeting held at Pittsburgh last week was one of determination to do a good job. From the reports presented by the secretary, it was evident that the present status of the membership list is excellent, but that it is susceptible to considerable improvement. Let's all help improve it.

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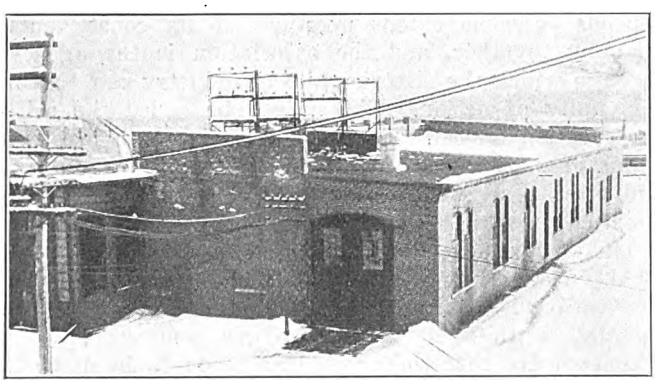
Automatic Substation Practice at Concord, N. H.

Local Traction System, Serving the Capital City of the Granite State, Utilizes Two Installations of Labor-Saving Type with Noteworthy Reduction in Operating Expenses at Small Investment Cost

THE use of non-attendance substation equipment by the Concord (N. H.) Electric Railways illustrates the effectiveness of this method of power distribution from the point of view of economies in operating expenses. This railway operates about 31 miles of single track, with a maximum car schedule of twenty-five units and a minimum of fourteen. Serving the capital city of the Granite State and its surroundings, the road utilizes hydro-electric energy generated at Franklin, N. H., and the car service is operated by 600-volt direct current obtained from motor-generator sets and rotary converters located in substations formerly operated with manual control. An investment of $9,300 has yielded an annual saving in operating labor cost of $6,750. Thus the entire first cost of the automatic equipment will be liquidated in less than eighteen months.

Two substations are in service with non-manual operation. The first of these, located at the southern end of the city of Concord and called the "South End" substation, was installed in November, 1920. The other, or so-called "West Concord" substation, was installed in June, 1921, and is situated in a former steam-plant structure still containing reserve boilers and engine-driven generating machinery, located about 2 miles outside the urban center on the northern side of the community. The first substation is started manually and the second is equipped for full automatic operation.

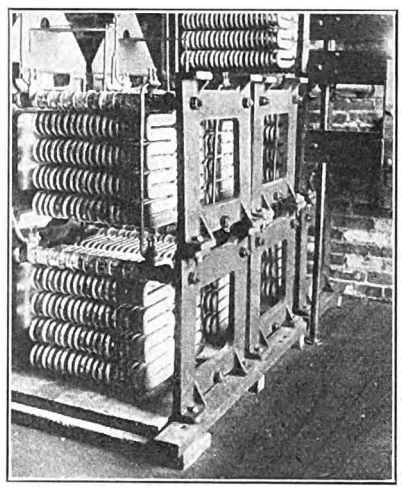
The South End substation is housed in a section of the company's general repair shop building. The automatic equipment here was furnished by the Automatic Reclosing Circuit-Breaker Company, Columbus, Ohio. Power is delivered to this substation at 22,000 volts, and



SOUTH END SUBSTATION AT CONCORD IS HOUSED IN A SECTION OF THE REPAIR SHOP

two sets of 150-kva. transformers supply current at 385 volts to two 300-kw. Westinghouse rotary converters. Two 22,000-volt, three-phase circuits connect the substation with the Franklin hydro-electric plant, nineteen miles north of the city, and also furnish energy for the lighting and power required at the Concord shops of the Boston & Maine Railroad, adjacent to the substation, and in addition for a number of towns north of Concord, including Newport, Warner and Bradford.

The equipment at the South End substation is standard for this service and is centralized on four switchboard panels, two of which are assigned to machine service and two to feeders. From this substation local service to the railroad shops is also controlled. Two feeder breakers, two machine breakers, two thermostat relays on the rotary converter bearings and two speed-limiting devices comprise the principal automatic equipment, and a striking feature of the installation is its compactness. The breakers occupy small square panel sections at the top of the regular panels, and very little difficulty was experienced in changing over the substation from all-manual operation. There has been no outlay for repairs since the installation went into service, and beyond a regular weekly inspection nothing in the way of overhauling has been required.



MOTOR STARTING RESISTORS IN WEST CONCORD AUTOMATIC SUBSTATION

Two Anderson time-clock switches are provided so that either rotary can be shut down at a predetermined hour, separately or together. These shutting-down times are governed according to anticipated traffic and work-car conditions, but usually in the small hours of the morning both units are out.

The cost of this automatic equipment was about $1,400 per unit, or $2,800 for the substation.

WEST CONCORD SUBSTATION IS FULL AUTOMATIC

The West Concord substation also receives power from the double 22,000-volt transmission line from Franklin. This is a complete Westinghouse installation which occupies a space only about 15 ft. wide by 30 ft. long at one end of the auxiliary steam plant. One 300-kw. motor-generator set is in use here, the unit consisting of a 600-volt direct-current generator direct-driven by a 2,300-volt synchronous motor. This unit is provided with a shaft extension so that it can be engine-driven in emergency. Three 150-kva. transformers supply energy to the motor. One of the illustrations shows the direct-current end of the motor-generator and a "close-up" of the thermostatic switch attached to the bearings, arranged to shut down the machine in case of overheating. A general view of the switchboard is shown in another illustration and details of the relay panels in a third.

In this substation, as at the South End, existing equipment was utilized in the way of conversion apparatus, but four new switchboard panels were required. Two of these have been mounted at the left-hand end of the board and two at the right-hand end. The former are used chiefly to carry the automatic relays required for

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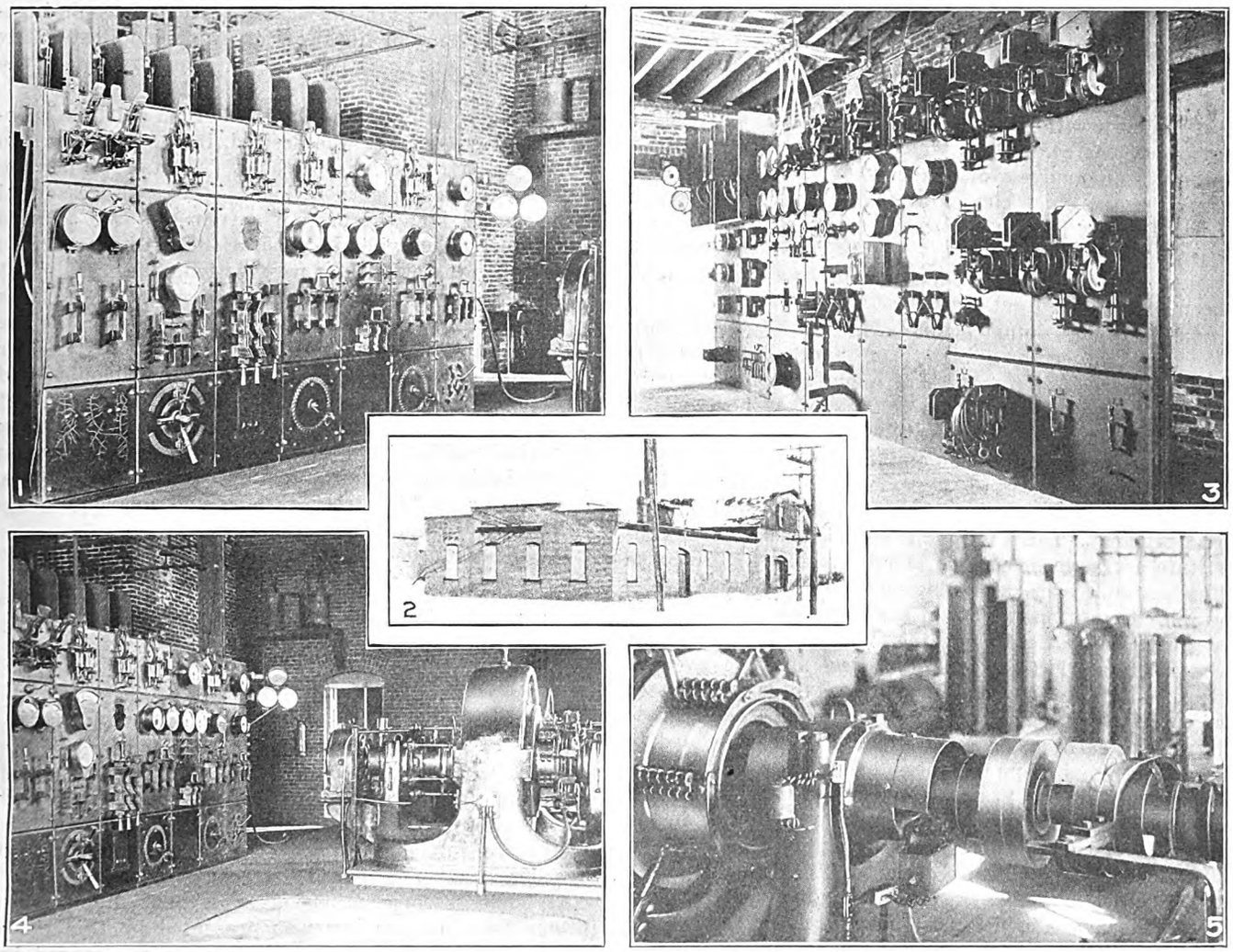
the various opening and closing operations, the latter being used in connection with the mounting of feeder circuit breakers.

The equipment which was used in the automatic operation of the substation is of the usual type, but a new feature has been added in the shape of a relay which opens the machine direct-current contactor before the alternating-current contactor, preventing arcing which otherwise might result from opening the 2,300-volt circuit under load. The installation is also designed so that by a slight change in wiring on the rear of the panels the equipment can be adapted at once to all-manual operation if desired. At one end of the board is mounted the motor starting resistance.

Aside from the electrical changes effected in this substation, heavy wire screens were provided on the windows to prevent unauthorized entrance and possible danger to trespassers. An asbestos mat ¼ in. thick was also laid on a platform placed directly in front of the board.

The approximate cost of the switchboard equipment and control apparatus for this substation was $6,500, providing complete automatic operation. As at the South End substation, a weekly thorough inspection suffices.

The load requirements and prospects of the road do not indicate the necessity for installing further equipment for automatic service, but the results have been most satisfactory. The total cost of the two installations is about $9,300 (the translating and transforming equipment and original switchboard panels being utilized without additional outlay for such new apparatus). To operate these substations by hand involved three men in summer and four in winter, at a total annual wage outlay of $6,750 more than is now necessary. Besides this, the improvement in voltage regulation and reduced drop secured through welded bonding of the track have decreased the amount of energy purchased for the southern suburban line service from the Manchester Traction, Light & Power Company to a large extent. J. B. Crawford is general superintendent of the Concord Electric Railways.



SUBSTATION VIEWS, CONCORD, N. H., ELECTRIC RAILWAYS

No. 1. Automatic reclosing circuit breaker equipment installed in substation.
No. 2. West Concord automatic substation.
No. 3. Automatic control apparatus at West Concord substation.
No. 4. 300-kw. rotaries and automatic switchboard apparatus installed in South End substation.
No. 5. This coupling provided for engine drive of rotaries in case of power failure.

The American Engineering Standards Committee has approved as tentative "American standards" the specifications of the American Society for Testing Materials for cold-drawn bessemer and open-hearth steel automatic screw stock, and methods of chemical analysis of manganese bronze and bronze metal.

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New York Electric Roads Pay High Taxes

Investigation by a Legislative Commission Shows that Under the Present Complex System of State Taxation the Electric Roads Pay a Much Larger Percentage of Their Net Income in Taxes than Other Kinds of Business

BY FREDERICK C. MILLS
School of Business, Columbia University

AN INVESTIGATION just completed by the joint legislative committee on taxation and retrenchment of New York has revealed certain facts of general interest concerning the condition of public service corporations in New York State. The statistical report of the committee, which was issued on Jan. 25, presents an analysis of the burden of state and local taxes on the chief classes of public utilities and compares the tax burden borne by these groups with that borne by financial institutions and business corporations. Some startling variations in tax burden have been brought to light by this study.

Corporations doing business in the State of New York are subject to a variety of taxes. Business corporations (*i.e.*, mercantile and manufacturing corporations) are subject to a straight tax of 4½ per cent on their net income, plus local taxes on real property. National and state banks and trust companies pay a tax which amounts to 1 per cent on their capital, surplus and undivided profits, together with taxes on real property. Taxes on public service corporations constitute a system of considerable complexity. The State imposes on steam railroads and on telephone and telegraph corporations a capital stock tax, the tax rate for a given corporation depending upon the dividend rate, the relation of assets to liabilities, and the average price of the stock sold. In addition, these two classes of corporations pay a tax of ½ per cent on their gross intrastate earnings, a term which has been defined to mean earnings from business originating and terminating within the State. Gas and electric companies are not subject to the capital stock tax, but pay to the State ½ per cent on gross earnings, plus 3 per cent on the amount of dividends declared in excess of 4 per cent. Electric railways (not including underground electric railways, which are taxed upon the same basis as steam railroads) do not pay the capital stock tax. The gross earnings tax for this group is at the rate of 1 per cent, and they pay a tax of 3 per cent on dividends in excess of 4 per cent.

LOCAL TAXES MUST BE PAID ALSO

In addition to these state taxes all public utilities are subject to two local taxes, a general franchise tax and a general property tax. The basis of the former is the value of the tangible property in the streets, highways and public places, plus certain intangible elements, the value of the latter being determined annually by the State Tax Commission. Considerable litigation has arisen in connection with these special franchise valuations. The general property tax is levied upon all real and personal property, excluding that which is assessed with the special franchises.

Merely to enumerate these taxes gives some idea of their complexity, though it does not indicate all the difficulties involved in their administration, both for the tax authorities and for the corporations subject to them.[1] The objects of the legislative committee on taxation were the simplification of this complicated tax system and, so far as possible, the equalization of the tax burden.

In the determination of the tax burden a double problem was involved. It was desired, in the first place, to determine the relative weight of the tax burden on different classes of corporations. It was also essential to determine how the present system of taxes affected the different individual corporations within a given group. The statistical investigation, the results of which are now available, was undertaken with this double object in mind. Net income was adopted as the best available standard of tax-paying ability. For each class of corporations, therefore, the amount paid in taxes has been expressed as a percentage of net income, though the original levy may have been upon an entirely different base. In making the comparison on this basis the committee points out that net income, as used for business corporations and financial institutions, is not in all respects identical with the net income of public service corporations. It is held that general comparison is possible in spite of these slight differences, but that refined comparison would be out of order.

TABLE I—GROUPS OF UTILITIES CONSIDERED, WITH NUMBER OPERATING AT PROFIT

Class of utility	Total Number of Corporations	Number Operating at a Profit	Percentage Operating at a Profit
Steam railroads	60	43	71.5
Electric railways	56	34	60.7
Telephone and telegraph	66	62	94.0
Gas and electric	108	97	89.8
Total	290	236	81.5

As business corporations are now taxed upon a net income basis no problem was presented by this class. Data regarding financial institutions were secured by means of questionnaires sent to all banks, trust companies, investment companies and savings banks in the state. Replies were received from 93 per cent of the total number in the State. The ratios as finally worked up for this group were based upon averages for the three years 1918, 1919 and 1920. The primary sources of information regarding public service corporations were the reports of these utilities to the Public Service Commission and to the State Tax Commission. For each class of public service corporation a representative sample was selected from among those corporations for which records were complete for the ten year period 1911-1920. The ratios were worked out on the basis of ten-year averages for this sample group.

Preceding the general discussion of tax burden in

[1] In order to determine what the expenses of complying with the present tax laws amounted to, the committee circularized all the public service corporations in the State. For 330 corporations replying, the expenses involved in paying taxes and contesting assessments amounted to $366,785 annually. (This does not include, of course, the amounts paid in taxes.) Of this total $175,381, or 48 per cent, had to do with the special franchise tax.

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the report of the committee are figures showing the number of corporations included in the samples on which the ratios are based, and the number and percentage in each class operating at an average profit over the whole period covered. The figures presented for the four chief utility groups are given in Table I.

Telephone and telegraph companies show the highest percentage operating at a profit, while electric railways show the lowest percentage.

Relation of Taxes to Net Income with Different Utilities

In measuring tax burden, the committee first sets up a comparison between the individual corporations within each of the given groups. When total taxes, state and local, are expressed as a percentage of net income, the ratios for individual electric railways vary from 15 per cent to 625 per cent. That is, there is one company for which total taxes amount to 15 per cent of net income and there is another company, at the other extreme, for which taxes amount to 625 per cent of net income.[2] The other companies lie between these two limits. The figures demonstrate beyond question that the present system of taxing electric railways results in marked inequalities of burden within this group. The actual distribution is shown in Table II.

TABLE II—RELATION OF TOTAL STATE AND LOCAL TAXES TO NET INCOME, ELECTRIC RAILWAYS IN NEW YORK STATE

Based upon the average annual tax payments and the average annual net income during the period of 1911-1920.

Class[3]	Number in Class	Number Showing Deficit	Percentage of net income paid in taxes—Number Paying: Less Than 50 per Cent	50 per Cent to 99 per Cent	100 per Cent to 149 per Cent	200 per Cent to 249 per Cent	250 per Cent to 299 per Cent	600 per Cent to 649 per Cent
A	10	3	4	2	1	..	..	..
B	27	8	10	4	1	..	3	1
C	19	11	4	1	2	1	..	..
Total	56	22	18	7	4	1	3	1

Of the eighteen corporations paying less than 50 per cent of their net income in taxes two pay from 15 to 20 per cent, one from 20 to 25 per cent, two from 25 to 30 per cent, four from 30 to 35 per cent, five from 35 to 40 per cent and four from 45 to 50 per cent.

Within the electric railway group wide variations in tax burden are found. When an average ratio of taxes to net income is worked out for the electric railway group as a whole and compared with similar ratios for the other utility groups significant inequalities are also found. These ratios are shown in the following table:

TABLE III—RATIO OF AGGREGATE STATE AND LOCAL TAXES TO AGGREGATE NET INCOME, PUBLIC SERVICE CORPORATIONS IN NEW YORK STATE, 1911-1920

Class of Utility	Number of Corporations Included	Ratio of Taxes to Net Income (Expressed as a Percentage Relation)
Steam railroads[4]	109	28.2
Electric railways	56	56.5
Telephone and telegraph	66	16.2
Gas and electric	108	24.1

[2]Net income before taxes have been deducted is the basis of comparison. Thus a ratio of 320 per cent means that a company showed a profit before taxes were paid, but that taxes wiped out this profit and left the company with a deficit. The ratios given, of course, apply only to companies showing a profit before taxes have been paid.

[3]Class A corporations are those with operating revenue $1,000,000 or over. Class B those with operating revenue from $100,000 to $1,000,000. Class C those with operating revenue less than $100,000.

[4]The figure for steam railroads is based upon an eight year average, 1911-1919, excluding 1916, for which adequate tax figures were not available. Returns from forty-nine lessor railroads have been included in establishing the above ratio.

This table shows that, for the fifty-six electric railways included in the sample, total taxes to the State of New York and to the localities within the state amounted to 56.5 per cent of net income[5] over the ten-year period 1911-1920. This ratio is exactly twice as large as that for steam railroads, the group closest to the electric railway group. For gas and electric companies taxes constitute 24.1 per cent of net income and for telephone and telegraph companies 16.2 per cent.

When companies showing deficits are excluded and ratios worked out for the profitable companies only, the results given in Table IV are secured.

TABLE IV—RATIO OF AGGREGATE STATE AND LOCAL TAXES TO AGGREGATE NET INCOME, PUBLIC SERVICE CORPORATIONS OPERATING AT A PROFIT

Class of Utility	Number of Corporations Included	Ratio of Taxes to Net Income (Expressed as a Percentage Relation)
Steam railroads	87	27.3
Electric railways	34	44.4
Telephone and telegraph	62	16.2
Gas and electric	97	23.0

The electric railway ratio is reduced to 44.4 per cent, but the general relations between groups remain the same. The burden on the electric railways, measured by the standard of net income, is shown to be distinctly heavier than on any of the other utility groups.

Inasmuch as state and local taxes are assessed and collected by different agencies and are levied on different bases the committee desired to determine the relative burden of taxes paid directly to the state, excluding the local property taxes. Table V contains the ratios given in the report, based upon returns from profitable companies only.

TABLE V—RATIO OF AGGREGATE STATE TAXES TO AGGREGATE NET INCOME, PUBLIC SERVICE CORPORATIONS OPERATING AT A PROFIT

Class of Utility	Number of Corporations Included	Ratio of State Taxes to Net Income (Expressed as a Percentage Relation)
Steam railroads	87	2.65
Electric railways	34	6.35
Telephone and telegraph	62	4.10
Gas and electric	97	2.80

Although the ratios are smaller, differences no less pronounced appear when this comparison is made. For electric railways taxes paid to the State constitute 6.35 per cent of net income. Telephone and telegraph companies show a ratio of 4.1 per cent, while for gas and electric and steam railroad corporations the ratios are materially lower.

Comparison with Business and Financial Institutions

It is apparent that, as between the different utility groups, the burden of present taxes falls most unequally upon the different corporations affected. Results equally significant are secured when the taxes paid by public service corporations are compared with those paid by business corporations and financial institutions. It is to be expected, of course, that the ratios would be higher in the case of public utilities, as these corporations have traditionally served as tax collectors for the state. To a certain extent this function has been recognized by the rate-making authorities in establishing rates for public service corporations, and some of

[5]Net income used as a base is, in each case, net income allocated to New York. Main track mileage has served as the allocation basis for steam and electric railroads. Wire mileage and the location of assets have served for telephone and telegraph companies.

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these taxes are passed on. Recognizing that such differences exist, however, the committee wished to determine what the present burden amounted to for these various corporate groups.

As the basis for this comparison the net income tax paid by business corporations was used. This amounts to 4.5 per cent of net income, or, to make the comparison exact, 4.3 per cent of net income before property taxes have been deducted. Corporations paying this tax are relieved of all other taxes except those on real property. For the purpose of comparison all taxes paid to the State by public service corporations, plus taxes on personal property and taxes on intangible elements in special franchise valuations, were taken to correspond to this business corporation tax. For financial institutions the bank stock taxes paid by national and state banks and the franchise taxes paid to the state by savings banks, trust companies and investment companies were accepted as equivalent to the business corporation tax.

In making a comparison of the tax burden borne by these different classes of corporations the committee points out that, because of certain differences in the definition of net income and in the number of years used as base in the study of the different groups, the ratios for the different classes should be used to establish general relations only. This applies particularly to the comparison of financial institutions with public service corporations. The ratios presented in Table VI should be studied with this caution in mind.

TAX RATIOS OF ELECTRIC RAILWAYS HIGHER THAN THOSE OF OTHER CORPORATE CLASSES

With the exception of investment companies and steam railroads all classes of financial institutions and public utilities are seen to be paying more in non-property taxes than business corporations. The ratio for the electric railway group is markedly higher than for any of the other corporate classes.*

The inequalities in tax burden revealed by this study have raised questions as to the advisability of fundamental alterations in the present system of taxing corporations in New York State. It has been demonstrated that under the present complex system pronounced inequalities have developed, both within each corporate group and between groups. The committee has developed a constructive program looking toward the elimination of these inequalities and the general simplification of the tax system. The action of the Legislature upon the proposals of the committee will be awaited with interest.

*It should be noted that the high ratio for electric railways is due in part to the character of the standard adopted. Although the committee adopted net income as the best available standard by which to measure tax burden, certain defects in that standard are pointed out. A part of the report is devoted to an examination of the relation between taxes, net income and gross income, the latter being the sum of operating revenues, less expenses, and non-operating income. Gross income deductions (interest and rentals) amounted to 74.3 per cent of gross income for electric railways, 57.1 per cent for steam railroads, 38.9 per cent for gas and electric corporations and 22.6 per cent for telephone and telegraph corporations. These figures indicate that electric railways raise relatively more of their capital by borrowing than do the other utility groups. If all capital were raised by borrowing net income would disappear, and the ratio of taxes to net income would be infinitely large. The greater relative importance of this method of raising capital in the case of the electric railways serves to increase the ratio of taxes to net income.

The committee has worked out certain ratios based upon the relation of tax accruals to net and gross income, in order to determine the effect of these deductions from gross income upon the tax ratio. The tax accruals in this case relate to all taxes, not to New York taxes alone; no allocation to New York has been made in the net income figure used.

Class of Utility	Ratio of Tax Accruals to Net Income	Ratio of Tax Accruals to Gross Income
Steam railroads	22.71	11.13
Electric railways	37.71	13.46
Telephone and telegraph	9.09	7.17
Gas and electric	19.10	12.58

It is apparent that when the ratio of tax accruals to gross income is determined the wider discrepancies found on the net income basis are ironed out, though they do not entirely disappear. The electric railway ratio is greater in each case than the ratios for the other groups.

TABLE VI—RELATION OF TAXES TO NET INCOME, BUSINESS CORPORATIONS, FINANCIAL INSTITUTIONS AND PUBLIC SERVICE CORPORATIONS IN NEW YORK STATE

(All taxes other than those paid on real estate property are included)

Class of Corporation	Ratio of Taxes to Net Income,* (Expressed as a Percentage Relation)
Mercantile and manufacturing	4.30
National banks	6.80
State banks	6.58
Trust companies	7.33
Investment companies	3.13
Savings banks	5.80
Steam railroads	3.88
Electric railways	15.60
Telephone and telegraph	7.20
Gas and electric	7.40

Letters to the Editors

Standardizing the One-Man Car

BROOKLYN, N. Y., Jan. 30, 1922.

To the Editors:

Although averse to a controversy over the merits of several types of one-man cars as related to the broad subject of standardization, I believe, after reading the letters of Messrs. Clark and Palmer, in the ELECTRIC RAILWAY JOURNAL for Jan. 28, that it would be inadvisable for the writer to drop the matter without a more emphatic and direct indication as to where these gentlemen, as well as many others, err.

It is difficult to reconcile the thought conveyed in the very able and complete editorial headed "Standardization Is Essential to Prosperity," published in the Jan. 7 issue of the ELECTRIC RAILWAY JOURNAL, with Mr. Palmer's comments regarding the problem of the Transportation & Traffic Association, in so far as they apply to one-man cars.

Mr. Clark has by no means grasped my viewpoint, as I have not said that the Birney one-man car is the last word in standardization. I believe that there never will be a last word in any form of standardization. Unfortunately, however, in the electric railway industry, standardization, as generally understood, seems to have been applied specifically to detailed parts rather than to complete units. This is not desirable because in any problem it is most essential that the general principles should be defined and clearly understood before an attempt is made to determine underlying details. If this principle was followed as regards electric railway rolling stock, it would decrease the large variety of cars now in service, many of them having originated through the whim and caprice of local railway employees in charge of the maintenance and operation of rolling stock.

The results are that after more than a quarter of a century of operation we find ourselves still confronted with a wide divergence of opinion and absolute lack of uniformity in car design. This condition does not refer particularly to Baltimore or Chicago, as they are little different from many other communities. I have referred to these specific examples only because of their prominence as examples in departing from the

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nearest approach to a standard car for city and suburban service than has been developed so far.

The best answer to Mr. Palmer's criticism of the applicability of the Birney car to general operating conditions is the fact that it is used throughout the United States in hundreds of communities with a population ranging from a few thousand inhabitants up to nearly 7,000,000, and that there are approximately 8,000 safety cars in service today. Furthermore, their operation has undoubtedly opened up the very broad field of one-man car operation, so that it seems probable that within the next ten to fifteen years, and no doubt much sooner, at least 80 per cent of the entire electric railway rolling stock will be handled upon the one-man principle.

Last year the writer, with one other railway employee, had the pleasure of co-operating with a manufacturers' committee whose purpose was to further the standardization of one-man cars. Considerable progress was made in spite of the many and diversified interests involved. Manufacturers must be ready to build any type of vehicle that the customer specifies, but it is hard to understand why specific designs of cars on the part of the railway company can be justified, except perhaps within communities where it is necessary to satisfy influences outside rather than within the corporation itself.

Mr. Clark's statement that the selection of the proper type of car should be decided from the operating standpoint by the operating man is indeed a fallacy. As car equipment is constantly in evidence before the public, purchases should be made with due regard to local public opinion, but careful consideration should also be given to avoiding unnecessary additions to the capital account, which mean much to the owners of the property.

WILLIAM G. GOVE,
Past-President American Electric Railway Engineering Association.

Douglas Fir as Tie Timber

WEST COAST FOREST PRODUCTS BUREAU

SEATTLE, WASH., Jan. 25, 1922.

To the Editors:

I regretted to see in the editorial "A Long Way to Go for Ties" in your Dec. 17 issue that you referred to the Doublas fir tie as "an inferior tie rated low in the scale of mechanical property ratings of lumber."

All softwoods are "inferior" to oak, for instance, in mechanical resistance, and hardwoods and all other softwoods, untreated, are "inferior" to cedar, redwood and cypress in durability, although these woods do not rank high in mechanical resistance. For fear, however, that some of your readers may understand the term "inferior" to refer to Douglas fir in the scale of softwood species, I would like to call your attention to a few facts in regard to Douglas fir.

One-fourth of all the standing timber in the United States is Douglas fir and it is rapidly coming to be a wood of prime importance in the East as well as in the West. It grows in mountainous country and this means that it grows at altitudes varying from sea level to 4,000 and 5,000 ft., under varying conditions of soil and rainfall and with varying exposure to the north and south and east and west on various slopes of the main ranges and their lateral spurs. As a consequence, there is a variation in type from rapid growth light-weight wood to close-grained dense material. Tables of species values, often unfortunately for Douglas fir, are based on the average of all types of Douglas fir, and their comparison with hardwoods and even with other softwoods does not give an accurate reflection of values which would apply to the types of Douglas fir which should be selected for various uses.

The Forest Service recognizes the above fact and in its correspondence gives proper comparisons and has now under way the preparation of matter which will put this information in proper published form.

Then again, referring directly to ties, Eastern railroads have for years used the highest type of wood structure for tie purposes and have considered white oak and chestnut as such. Western roads, on the contrary, perhaps because of the length of their lines through undeveloped territory and the necessity of seeking lowest first cost, have used the poorest section of the log, and the Western lumber manufacturer has considered the railroad tie as the outlet for material which could not go into any other grade.

As a consequence, data on Eastern and Western tie experience have been based on these uncomparable types, and the first Douglas fir ties which went into Eastern territory were of this character and undoubtedly gave an erroneous impression of the Douglas fir tie in many quarters.

Douglas fir is most comparable to and is classed by the Forest Service with the Southern pines, and Douglas fir of the rate of growth and density of longleaf pine has comparable strength in practically all properties with the type of Southern pine that is commercially known under this species name.

C. J. HOGUE, Manager.

EDITORS' NOTE: In his comment on the editorial printed in the Dec. 17 issue, Mr. Hogue brings out some valuable information regarding Douglas fir. This editorial was not designed to disparage the use of Douglas fir. It stated that 8 per cent of the ties used in the United States are made of this species of wood. It may be classed next to the oak, chestnut and longleaf yellow pine, especially in view of its seven years' estimated untreated life. The term "inferior" as it was used in the editorial was intended in the broad technical sense in which railroad men are prone to class all ties which are inferior in any way to white oak, longleaf yellow pine or chestnut as "inferior ties." Hence as used in the editorial "inferior" means simply "lower in rating."

The editorial reference to mechanical rating of timber was taken from the "Cross Tie Bulletin" for Feb. 15, 1921, page 6. The "scale of hardness" table referred to was from Bulletin 556 of the United States Department of Agriculture. This scale may be taken to indicate relative resistance to rail wear and need for mechanical protection.

It may be taken for granted that hardwood makes the best ties, particularly white oak, bur oak and chestnut. These are considered as the standard in railroad terms and any softwood is considered "inferior" for tie purposes. In the C., B. & Q. R.R. classification of tie timber for use with or without preservatives, the Douglas fir is classed as No. 4 in the softwood, treated class, being thus "inferior" to cedar or cypress, which do not call for treatment. This matter was discussed in the issue of this paper for Feb. 15, 1919, page 311, Table II. In the hardness scale white oak stands 1060 and Douglas fir 470. There are twelve species of wood of harder grades between the two.

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Great Interest at C.E.R.A. Annual Meeting

Considerable Information on Light-Weight Interurban Cars, Wheel Welding, Current Collectors, Track Maintenance, Pick-up and Delivery Freight Service and Publicity Brought Out in Papers and Discussion—Boat Trip Approved—S. W. Greenland Elected President

TWO hundred and fifty strong, railway men and supply men attended the annual convention of the Central Electric Railway Association at Indianapolis, Jan. 26 and 27. The meetings were notable for the great interest displayed in the subjects covered by the instructive program, the general harmony, good spirit and good time that prevailed under the able direction of President A. C. Blinn, Akron, Ohio.

Of the business transacted, the election of Samuel W. Greenland, Fort Wayne, Ind., as the new president is of outstanding importance. And perhaps next in order of popularity, if not serious import, was the almost unanimous approval by the convention of another boat trip for the summer meeting, as expressed in adopting a resolution recommending the boat trip to the executive committee. President Greenland appointed as members of the hotel and arrangements committee "Judge" S. D. Hutchins, Westinghouse Traction Brake Company, Columbus, Ohio, chairman; "Commodore" John Benham, International Register Company, Chicago, secretary; Harry L. Brown, ELECTRIC RAILWAY JOURNAL, Chicago; C. Dorticos, General Electric Company, Chicago, and James H. Drew, Drew Electric & Manufacturing Company, Cleveland, Ohio. They were instructed to report to the executive committee as to the cost and plan of the trip, and the executive committee will then determine whether the boat trip is "on" or "off" for 1922. But it may be said that the boat trip is practically assured.

Reporting to the executive committee on last year's boat trip, the hotel and arrangements committee showed total receipts of $16,256. The settlement with the boat company required $15,321.15 and miscellaneous expenses amounted to $583.51. Refunds for tickets sold but unused amounted to $461, leaving a deficit of $109.66.

The executive committee discussed the advisability of increasing the number of meetings from two to three a year, the convention having approved the opposite change last year, but the committee decided against such an increase now. Plans for next year were also discussed and several new memberships approved. Abstracts from the report of Secretary L. E. Earlywine appear on page 193.

A feature of the program was the banquet on Thursday evening, at which all serious thought was abandoned and the guests were most enjoyably entertained by W. L. Wilkie, attorney for the Northern Ohio Traction & Light Company, Akron, Ohio, and Thomas Hendricks, Cleveland. Mr. Wilkie's one serious thought was to urge more effort toward popularizing the electric railways. Mr. Hendrick's message, sprinkled in with a most humorous relation of the famous story of David and Goliath, in terms of 1922 language and interpretation, was to urge faith in one's self and one's work, the spirit of sacrifice that generates loyalty, and love of one's job for the job's sake. For by radiating these attributes, he said, we can do more than kings and potentates for the bettering of ourselves and our industry.

SAMUEL W. GREENLAND

The first session, Thursday morning, was given over to the address of the president, the business transactions and a paper on light-weight cars for interurban service. In the afternoon the Engineering Council had charge of the meeting and G. T. Seely, Youngstown, Ohio, as chairman of the council, presided. Papers on welding steel wheels, trolley contact devices and reclaiming tracks were read and discussed. Friday morning there was a paper by Mr. Ackerman on joint freight service by an interurban line and a trucking company and an address by Labert St. Clair on how to win public approval. The address of the president and these several papers appear elsewhere in this issue. The last business transacted before adjournment was the election of officers.

The nominating committee, which is composed of Charles L. Henry, L. G. Parker, G. K. Jefferies, W. S. Rodger and G. T. Seely, reported its choice at this time as follows, the convention making the elections by unanimous ballot: President, Samuel W. Greenland, vice-president and general manager Indiana Service Corporation, Fort Wayne, Ind.; first vice-president, James P. Barnes, president Louisville (Ky.) Railway; second vice-president, Harry Reid, president Interstate Public Service Company, Indianapolis, Ind. The following members of the executive committee were also elected: Robert I. Todd, A. C. Blinn, H. A. Nicholl, C. N. Wilcoxon, W. S. Rodger, F. W. Coen, J. F. Collins, M. B. Lambert, F. N. Root, G. T. Seely and W. K. Morley.

Considerable interest was expressed following the reading of Mr. See's paper on "Light-Weight Interurban Cars," that it has been possible to develop a light car satisfactory for interurban service. Although there was much misunderstanding evident in the discussion as to the distinction between cars for suburban service and those for interurban service, all concurred that there is an opportunity for lightening interurban cars generally. It was brought out that there are very few possibilities of carrying the standardization to any such degree as has been done with the safety car; on the contrary, it was realized that rolling stock for interurban operation must be designed with more attention to the conditions on each individual property. Some of those operating high-speed interurbans could not be convinced that cars as light as those described by Mr. See could satisfactorily comply with their conditions of speed and safety. However, they were ready to reduce car weights wherever possible and to conform to the best modern engineering practice.

Several instances were cited where light-weight cars are giving good or better service than heavier cars which they replace and at but a fraction of the cost. Excellent results have been obtained on the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, where 26,000-lb., 44-ft. interurbans equipped with four 45-hp. motors are being operated. After being operated 3,500,000 miles during the four years that they have been in use, the equipment is still in good condition. Their maintenance cost has been but

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1¼ cents per car-mile over this four-year period and there have been no armature repairs during the last three and one-half years. These cars use but 1 kw.-hr. per car-mile. Another company was reported to be operating some 14-ton cars which are otherwise the same, but have a maintenance cost of but 1¼ to 1½ cents per car-mile. The Kentucky Traction and Terminal Company, is replacing its old interurban equipment, which is still in good condition, with 12-ton forty-four passenger cars equipped with four 25-hp. motors. These cars will make a schedule speed of 22 m.p.h. and the present headway of one and one-half hours will probably be cut to one hour and possible to three-quarters of an hour on account of bus competition. The cost of this equipment was between $10,500 to $11,000.

Discussion of Welding Wheels

A discussion of the economics of building up flanges by electric welding versus only turning them, by R. C. Taylor, superintendent of equipment Michigan Railway, Albion, Mich., was presented in his absence by Mr. Earlywine. Mr. Taylor based his comparison on the cost per unit of wheel diameter for the purchase price plus the additional maintenance expense on the wheel during its life. On this basis he showed that for a 37-in. wheel the cost was 68 cents per unit for the welded wheel as against only 52 cents for the turned wheel. Similarly, for a 36-in. wheel, he showed the comparative figures to be 80 cents for the welded wheel and 64 cents for the turned wheel. He maintained that it was entirely meaningless to compare wheel costs on the basis of car mileage or wheel mileage. He noted that the mileage ratio obtained from the welded wheel as compared to the non-welded wheel in Mr. Sigler's paper was 1.16 to 1 and in Mr. Gunn's paper was 1.4 to 1. He said, however, that as the mileage or work cost is higher for the welded wheel, this advantage in mileage ratio may be of doubtful value.

Mr. Taylor also said that in endeavoring to reduce the cost of wheels per unit of work performed, the mechanical men have plenty of room for experimenting and discussion. He recalled what a great improvement has been made in the steel wheel since its introduction. Further improvement in rolled steel wheels may be expected when the roads insist on wheels made of better steel and its alloys, and treated and hardened to increase the work that can be obtained. Experiments are now being made along this line. The work of our present steel wheel may be considerably raised if we give the same attention to lubricating the flanges that we now do to the bearings. This should be done and doubtless will be in the near future.

P. V. C. See, Akron, Ohio, expressed some skepticism in regard to the effect of the welding on the structure of the steel, fearing that it might cause some strain in the metal of a dangerous character, and for this reason he said he had tried welding on wheels used on safety cars, but had not dared to do it for high-speed interurban wheels. A very pertinent point made was that four steel wheels in use by the Northern Ohio Traction & Light Company have recently broken, the most recent case having caused a very serious accident. Had this wheel been one on which welding had been done the company would have been seriously pressed to prove that the breakage was not due to the welding, or that the company had exerted the utmost care to preserve safety.

G. H. Kelsay, Elyria, Ohio, concurred in the expressions of Mr. See. On the other hand, E. B. Gunn called attention to the fact that, according to his method, there remained § in. of stock of the old wheel in the flange on which the new metal is built up, which gives a good factor of safety. If the welding is properly done and is not spoiled by an effort to do it too quickly, he thought that there is no danger of strain in the metal. He emphasized that good, careful welding work in this connection is absolutely necessary.

Another equipment engineer brought out the fact that on his system, with an average of 365,000 car-miles per month, he had never had a wheel break with the 37-in. steel wheels used. He thought that the need for welding flanges could be largely overcome by careful inspection. His comment was that sharp flanges are the result either of soft flanges or of out-of-square trucks. If the metal is soft it ought not to be welded. If the tendency toward wearing sharp is due to the truck being slightly out of square, this can be corrected by some work on the truck or by reversing the pair of wheels. He also felt that if the wheels were turned a little earlier, as the flanges wore thin, instead of waiting until the limit of safety had been reached, it would not be necessary to turn away so much of the tread and the aggregate mileage during the life of the wheel would be increased and would largely offset the advantage that might be secured from welding. He has secured an average life on the wheels mentioned of 168,000 miles.

Terence Scullin, Cleveland, Ohio, was inclined to depreciate the cost figures given in the papers. He reiterated the thought made in Mr. Taylor's discussion that he believed heat-treated steel wheels could be produced at a small additional expense and that the mileage could thereby be doubled. He thought that there was no good reason why the same excellent results cannot be obtained from treated steel wheels that have been derived from the use of treated steel gears.

One of the delegates present brought out the fact that the Erie Railroad is welding passenger locomotive flanges extensively and sending them out rough without any machining. This is also the practice followed by M. M. Nash, Terre Haute, Ind., on the interurban cars of the Terre Haute division, Terre Haute, Indianapolis & Eastern Traction Company. In this welding work Mr. Nash does not have the wheels removed from the truck, the truck merely being rolled out from under the car for convenience in working. He has one pair of wheels that have gone 266,000 miles and as far as he could see, he said, they were good for that much more. The method of wheel welding followed by Mr. Nash was described in ELECTRIC RAILWAY JOURNAL for May 7, 1921, Volume 57, page 860.

A representative of one of the wheel manufacturers expressed the view that the welding of flanges was an unsafe practice because the sudden cooling which follows the fusion of the metals, due to abstraction of the heat by the surrounding steel, is almost the same as quenching, and therefore is very likely to set up unusual strains in the metal of the flange.

Chairman Seely summed up the discussion by saying that while there is much doubt on the part of many equipment engineers, it is nevertheless true that the practice of welding is being followed to the satisfaction of the officials of certain companies, and he thought they would not permit this to be done if they were not reasonably certain that it was safe. He commended the men who had the nerve to try out the practice.

Discussion on Current Collectors

J. F. Elward, master mechanic Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, in discussing the papers on the relative merits of the trolley shoe and the trolley wheel, said he had at one time had seventy-five shoes in use in city service and that they had been very satisfactory except for the inability to back up. Recently the Danville division of the T. H., I. & E. has been equipped with a new type of shoe made by the Automatic Sliding Trolley Company, Frankfort, Ind., having a wheel at the rear end of the shoe which comes in contact with the wire when the car backs up. Mr. Elward said that the operation of this shoe was good, but the maintenance high. He said that with the shoe, costing him $7.50, he had obtained 8,778 miles, or a cost per 1,000 miles of 85 cents. By way of comparison, he said that a trolley wheel costing $1.39 gave 4,064 miles, or a cost of 34 cents per 1,000 miles. He made the comment that if as much attention were given to perfecting trolley wheels as is being given to sliding contacts there would be much less trouble than there is with the wheels.

In regard to the building up of copper in the groove of trolley wheels, he said that an investigation to explain the cause of this had been made and it had developed that the trolley stand was worn, the harp loose and the pin worn, causing high resistance in the circuit. By putting a jumper around these parts, the trouble was eliminated.

Another master mechanic said he

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had never had a trolley wheel build up. He had tried seven different kinds of trolley shoes and said that if it were not for the difficulty in backing up the Miller shoe would be a great success on high-speed lines where the current collected is large. He said that in order to average 3,000 miles on a trolley wheel, it is necessary to have the best wheel made and everything about the collecting mechanism just right.

W. McKay White, Goshen, Ind., pointed out that experience had shown that the sliding contact does not work as well on No. 00 wire, such as is used on some city systems, as it does on No. 000 and No. 0000 wire. In reply to a question about the use of shoes on city lines, he said that the shoe is being used with success by the Oakwood Street Railway, Dayton, Ohio, and by the city lines in Los Angeles, Cal. The use of the shoe on grooved wire somewhat approximates the pantagraph which is considered the best current collector. He said that one equipment man had found that if he tightened up the harp so that the wheel rolled hard, copper would be built up on the wheel; and then if the harp was loosened, the wheel would wear out. The large current collecting capacity of the shoe is its main virtue. He also pointed out that the trolley shoe has been far more successful on steel wire than the wheel.

Professor D. D. Ewing, Purdue University, presented some of the results of a study of the electrical and mechanical losses in current collecting devices which threw much light on the subject. The results of this study were given in an article which appeared in ELECTRIC RAILWAY JOURNAL for Oct. 23, 1920, volume 56, page 866. Professor Ewing also presented the results of further investigation on this subject, which appears elsewhere in this issue.

DISCUSSION ON PICK-UP AND DELIVERY SERVICE

In the discussion which followed the paper by Mr. Ackerman on pick-up and delivery service, it was brought out that the railway company, in conjunction with a trucking company in Cincinnati, maintains three rates: A straight class rate for the railway service only, a pick-up and delivery rate which includes both railway and trucking service, and a pick-up or delivery rate which covers the railway service and trucking at one end of the rail haul only. The pick-up and delivery service has added approximately 100 per cent to the standard railway rate. This makes a total rate practically equivalent to that for express. Any claims occurring, if the responsibility is concealed, are distributed 50 per cent to the railway and 50 per cent to the trucking company. If the responsibility can be fixed on either the railway or the trucking company the one involved pays the total claim. Mr. Ackerman said, however, that the claims involved have been reduced as compared to the former claims of the railway before the joint arrangement with the trucking company was entered into. Practically any class of freight will be handled, the only restriction being on live stock. In providing the pick-up or delivery service in the smaller cities reached by the traction lines, the cost is paid out of the railway revenue. This has been found necessary in order to meet the competition. The company in Cincinnati with which the traction company has this joint arrangement has a fleet of sixty-four trucks and it has been transformed from a competitor of the traction line in freight hauling to an ally.

Expresses Confidence in Future of Traction*

President Blinn in Address Before C.E.R.A. Speaks of Rates, Urges Financing by Customer Stock Sale and Points Out Feasibility of Using Motor Buses

BY A. C. BLINN
Vice-President and General Manager
Northern Ohio Traction & Light Company, Akron, Ohio

IN SELECTING Indianapolis for this meeting, the Central Electric Railway Association was prompted by a genuine desire to honor our distinguished co-worker who heads the American Electric Railway Association—Robert I. Todd. This is his home and from here he has performed gallant service to this great industry which we represent. Mr. Todd has long been a valued member of our organization. He was its president in 1920, and this association feels that it has been signally honored by his selection as president of the American Association where he will have the fullest opportunity to perform a great work for which he is so ably qualified.

I desire, upon this occasion, also, to publicly express my thanks for the cooperation and help of the executive committee and my fellow officers. To me they have given full measure of assistance.

During the year 1921 your association held one meeting in the latter part of June on the steamship South American, which was largely attended by the members, their families and friends. That meeting was a success in every particular, and the thanks of the association are due the hotel and arrangement committee, whose untiring efforts resulted in one of the most enjoyable summer meetings this association has ever held. Our members have little conception of the vast amount of work involved in arranging for that boat trip, and too much cannot be said in praise of those who had the matter in charge.

A careful review of the operating results obtained during the year just passed, brings to the mind of the busy operator few thoughts that are refreshing. In 1920 the electric railways entered the period of business depression in a miserable, half-starved condition, brought about, let us say, by a lack of understanding on the part of rate-regulating bodies concerning our real problems and the numerous difficulties with which our properties have been confronted for many years. The manner in which the managements are bringing the companies through this trying period insures for them the profound admiration of every business man in this country.

Rates have not been, and are not now, in any sense commensurate with the cost of conducting the business in a manner demanded by the public. In many cases, particularly where the control has rested with municipal authorities, rates have been changed simply as a matter of political expediency, little regard, if any, being given to the necessities of the situation.

During the period of the war operating costs were higher than had ever been experienced in our history, and when all other business was enjoying profits far beyond its fondest dreams, our railways were, in most instances, kept by rate-regulating bodies in a condition where they were compelled to serve the public at rates which were by no means adequate to meet all of the costs. The great outstanding feature of those times is the fact that the public was not required to pay proper rates at a time when it was well able to do so.

However, notwithstanding the great difficulties with which we have been confronted, the companies we represent are coming through this depression in a manner that must eventually gain for them the highest commendation on the part of the business world and of the public generally.

We are engaged in operating properties that are performing a great public service—a service that has become an absolute necessity to millions of people, a service that is a material factor in the successful growth of the territories in which our lines are located. Our properties have two important functions:

First, they must, in order to be successful, render service from day to day of the very highest character; second, and equally as important, their facilities must be extended from time to time as the public necessity requires.

If the utility is unable to grow with the community, the community must suffer because it cannot expand without transportation service. To perform either one, or both of these important duties, our corporations must have an income that will pay all operating costs, taxes and depreciation plus a reasonable return on the investment, with sufficient balance to create a surplus to meet unusual hazards—a sufficient balance to be called upon in times of great stress, a balance to tide the properties over in lean years.

Much has been said in the past with

*President's address to the annual convention of the Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

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respect to educating the public to the necessity of higher rates. Much has been accomplished along this line, and at this critical period in our lives we must approach the future with renewed efforts towards building good will and educating the people generally on the question of income and outgo. Under present revenues the electric railways cannot properly serve the public year after year as the public is entitled to be served. Our service cannot be of the high type which is demanded, nor can the facilities be extended, unless the rate situation is materially improved.

The public must understand that these properties require large capital expenditures each year, and that capital cannot be forced into this or any business; it must come voluntarily from the investor and it will not come unless it is assured of a safe and regular return.

We must pay labor its wage, likewise we must pay the wage of capital. Like labor, if capital cannot earn it will not work. If this business is denied proper rates it cannot earn. The rate-regulating authorities in this country in numerous cases have recognized these fundamentals and have granted some measure of relief. On the other hand, there are many instances where such relief has been denied.

Where rates are fixed by politicians for political purposes there is but one relief and that is from the public itself. No effort should be spared to lay all the facts before the people. We should let no opportunity pass to drive home the argument that this business does not differ from any other business in that it cannot render good service from day to day without an income that will pay all the costs of operation, build a surplus, pay a reasonable return on the investment, and

Further, that our companies cannot bring the much needed new capital into the undertaking, extend their facilities from time to time, unless proper rates prevail.

Stock Sales to Customers Urged

Because of the difficulty in obtaining new money in the manner customary to this business, many public service corporations have undertaken to sell their securities in the communities where they operate. These efforts in many cases have met with wonderful success, and a most ideal condition is to have a large number of stockholders in the territory we serve.

I venture the assertion that the acquisition of an interest in the properties we represent by the customers of these properties will have a sobering influence upon radicalism. In my judgment where the savings of local citizens (customers) are invested in their utility the chances of fair treatment are multiplied and the likelihood of serious disputes reduced. It will be interesting to watch the course of proposed radical legislation in communities where the customer-ownership idea has gained considerable headway. If I look into the future aright, participation in our business through investment in our securities bodes ill to the demagogue whose success in the past has so often been based upon appeals to ignorance and indifference in districts holding false notions, or no ideas at all, about local utilities.

But securities cannot be sold in our several localities unless the purchaser can be assured beyond the question of all doubt that his dividends are going to be paid with regularity. He looks for that assurance when making an investment in business other than ours, and he has the right to expect it if he invests with us. Therefore, one of the great problems is to obtain an income that is fair to the stockholders, and fair to the users of the service.

Create a Feeling of Confidence

We must use every endeavor to create in the minds of our people a feeling of faith and confidence in our institutions. One great difficulty that has existed throughout this nation in the past is that the plant of "confidence" has not been nourished and has not grown as it should. It has suffered severely from the cyclone it has weathered. It is this restoration of confidence which we seek when we foster customer-ownership. If the users of our service have faith in our properties and in us, and we are allowed to earn on the dollars invested in the property, then we can expect our patrons to become partners in our business.

The company which I have the honor to represent has been selling its preferred stock in the territory in which it operates since July, 1921. Up to the present time it has sold approximately 6,000 shares to the users of its service. The money derived from the sale of its stock has been used only for capital expenditures, and this company will continue to do a large part of its financing in this manner because of the many benefits that can be derived thereby. I urgently recommend that the properties here represented thoroughly investigate this method of finance and put it into effect wherever it is possible for them to do so.

In my judgment customer-ownership will establish, beyond doubt, confidence which will have for its just reward the development so sorely needed, to the end that the wheels of progress may once again grind out their daily grist. It is only natural that the people we serve should be our stockholders. Ours is a business they can see every day, one in which they should have confidence and one which will pay them substantial returns on their investment if that investment is properly treated. It is not sufficient merely to offer our securities for sale. They must be offered in small enough denominations, or on the easy-payment plan, so that all can buy. They must be made readily available across a counter, like bread and bacon in a grocery store.

I desire at this time to direct your attention to the development now taking place in bus operation as a means of city and interurban transportation. In my opinion buses will never replace street cars in the large cities of this country. I do believe, however, that we are approaching the time when the growing use of the automobile is going to seriously tax the capacity of our streets and it must follow that urban transportation will be taken care of in a manner calling for the smallest number of units.

The latest type of city motor car and trailer will carry from 175 to 200 persons. To haul the same number with buses would require approximately eight vehicles. It will be seen, therefore, that one street car unit carrying approximately 200 persons during the rush hours, when the capacity of the streets is taxed to the utmost, must survive as against eight motor buses giving the same service. There is a field, however, in which motor transportation can function. I refer to densely populated, outlying districts, not now served by transportation lines which can be found in almost any up-to-date city. These territories can be admirably served for the time being by motor buses, either as extensions to existing railway lines, or buses may be operated advantageously as one line of a railway transportation system. The growing interest on the part of the public in bus transportation calls for a close study of the subject by every railway manager. If the people desire and demand bus transportation, our companies should be the ones to furnish it because we are primarily in the transportation business. The methods are of little consequence.

In conclusion, permit me to look for a moment into the future. Sooner or later business must improve. It is almost impossible to believe that it can become more stagnant and, having weathered the storm so nobly, our properties can look forward with encouragement to the business revival that certainly must come. When the tide will turn no man can tell. We will continue the rigid economies now in effect; we will not be led astray by the cheap optimism that is abroad on every side; we will go on with courage; we will continue to serve; we will do our best, and finally, we will win because we only ask that ordinary justice be given us.

Annual Report of the Secretary and Treasurer

L. E. Earlywine, secretary and treasurer of the association, in presenting his report, referred to the accomplishments of the last twelve months as representing a real advance in the association's activities. He laid particular stress upon the committee work, showing that the new system of executive committee meetings has resulted in better management of the association. He also paid special attention to the organization of the Engineering Council outlined previously in these columns. He quoted one member of the Council as remarking "there are some bouquets, also some

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bricks, thrown during the meetings, but the purpose of the council is to arrive at the unvarnished truth."

The year 1921 closed with a membership of sixty-four interurban lines, five city lines and three lake steamer lines. The total interurban mileage represented was 5,273.6. This membership represents a decrease of one interurban line and an increase of one city line over the record of the preceding year.

In reporting on the activities of the Central Electric Railway Accountants Association, Mr. Earlywine pointed out that its principal attention had been toward the adoption and use of standard forms, such as astray freight bill, interline way bill, etc.

In reporting on the activities of the Central Electric Railway Traffic Association, he said that it had done a great deal toward the revision of all association joint tariffs, all having been completed with the exception of two during the year. Among the freight tariffs reissued were the equipment records, storage tariff, and exceptions to official classification. Passenger tariffs reissued are tariffs covering movement of special baggage cars, party-fare tariff, 2,000-penny coupon ticket tariff, intrastate passenger tariff in Indiana, joint interstate passenger tariff, as well as the joint local baggage tariff.

Under the auspices of the association, the official interurban map has been revised and new plates made.

He called attention to the particular activities of the committee on prevention of freight claims in its efforts to avoid having steam lines "dump" second-hand containers on the electric lines.

Another committee becoming active is that on motor bus and motor truck competition. This committee, Mr. Earlywine pointed out, is not throwing stones at motor competition, but works on the idea that while the motor bus is here to stay, there is a certain defined place for it and it should be the duty of all transportation officials to see that it is held to its place.

In closing Mr. Earlywine placed emphasis on the attitude of the public which likes to consider electric carriers —interurban lines—as one line in dealing on through transportation questions whether passenger or freight. He recommended that the association continue to work to iron out all difficulties of interline co-operation.

Light Interurban Cars Save $47,000 Annually*

Better, Safer Service Given on N. O. T. & L. Line with 42,000 Lb. Cars—How These Cars Effect a Saving Amounting to Over 19 per Cent on the Investment Is Interestingly Analyzed

BY PIERRE V. C. SEE
Superintendent of Equipment Northern Ohio Traction & Light Company, Akron, Ohio

AN UNCLE of mine in the Tennessee Mountains had for his favorite saying the phrase, "It stands to reason," in discussing the economy of converting corn he raised into a compact fluid. He held it to be more economical to invest in a small barrel then in a big corn crib, the maintenance on the barrel being considerably less than on the crib over a period of years, to say nothing of the lesser original investment and the revenue produced.

It "stands to reason" that a compact, light-weight, steel electric street or interurban car is more economical to operate than a heavy wooden or steel car, but the questions in the mind of most electric railway managers are:

Will the light-weight car give the satisfaction for interurban service that the heavy type has given over a period of years? Will the cost of maintenance be less? Will there be a real saving in dollars on the investment, a saving in energy, a saving on the roadway? Will the lighter car meet with public approval for interurban service?

These are questions of vital importance to railway operators, and these are the questions I shall endeavor to answer—not by saying that "it stands to reason" the saving is there, but to submit to you plain figures based upon one year's operation of the light-weight interurban car on the Akron-Kent-Ravenna division of the Northern Ohio Traction & Light Company's interurban system. It may be added that subsequently other cars of this type were placed in service between North Canton, Canton and Massillon.

Electric railway men throughout the world have recognized, during the last few years of rising costs, the necessity for more economical operation if the electric railways were to develop properly to meet the public needs. It was not strictly from the viewpoint of economy, however, that the Northern Ohio Traction & Light Company put into use the lighter type of interurban cars, but rather from a desire to better the service and add to the safety of operation.

In 1919, travel became exceptionally heavy on this division of the system, due to the establishment of new industries and to park travel. The towns reached by the line are Kent and Ravenna, the latter being the eastern terminal, and both having a population exceeding 7,000. A summer resort between the two places, known as Brady Lake, brings a heavy summer traffic. The line runs through the principal street of Cuyahoga Falls, a city of 10,000, joining Akron on the northeast. The territory along the line is closely built up, so that more than half of it is city streets and suburban districts where high-speed running is not permissible. The line is 18.6 miles of single track and it has numerous heavy grades and curves. There is one 12 per cent grade about 2,200 ft. long and many 4 and 5 per cent grades over the rolling profile.

The company in 1919 was operating a wooden type car weighing 62,000 lb. equipped with quadruple G.E.-57 motors and K-34D control. The motors had a high-speed gear ratio. The frequent stops and the heavy grades and curves brought high maintenance on the electrical equipment. It was necessary also to operate each car independently, running the trains in sections, for the reason that these cars were not equipped with multiple-unit control.

Investigation relative to multiple control led to inquiry concerning a lighter type of car. The advantages of a lighter car, geared for a lower balancing speed, were immediately recognized with the result that lighter center-entrance cars of the Peter Witt type were ordered for the line in the spring of 1920. Delivery was made in October and on Nov. 1, 1920, the old cars were replaced by Peter Witt cars having 26-in. wheels, weighing 41,900 lb. and having a seating capacity of fifty-four passengers. The cars were equipped with quadruple Westinghouse 532-A motors of 50 hp. each and H.L. control arranged for multiple-unit train operation. The heavy grades prevent the use of trailers. The motors were geared for a balancing speed of approximately 32 m.p.h. at 600 volts. A detailed comparison between the old and the new cars follows:

	Old Type Car	New Lightweight Peter Witt Car
Weight, pounds	62,000	41,900
Length	45 ft. 3 in.	50 ft. 3 in.
Height of floor above rail	50 in.	36 in.
Seating capacity	46	54
Motor equipment	4 G. E. 57	4 W.H.532-A
Motor, horsepower	50 at 500 v.	50 at 600 v.
Gear ratio	24–63	16–56
Size of wheel	36 in.	26 in.
Free running speed, at 600 volts	40 m.p.h.	32 m.p.h.
Kilowatt-hours per car-mile at car	3.26	1.80
Kilowatt-hours per car-mile, at d.c. bus	3.95	1.97
Maximum current from trolley	540 amp.	340 amp.

It will be noted that the new cars weigh only two-thirds as much as the old cars, yet are longer and have a greater seating capacity. The light rattan seats do not give quite the comfort of the heavily padded plush seats, but no complaints have been received because of this. The reduction in the wheel diameter from 36-in. to 26-in., taken in conjunction with the correspondingly smaller bolsters and trucks, results in a difference in height of car floors of 14 in. This materially facilitates passenger loading. A further saving in the length of time required for stops is made possible by the center entrance, in that passengers may load and unload at the same time. The control is interlocked with the doors. Door signals only are used in starting trains.

*Paper presented before Central Electric Railway Association annual convention at Indianapolis, Ind., Jan. 26, 1922.

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It may also be noted in this connection that the smoking compartment was abolished. This change not only caused no complaint, but rather a favorable public opinion, the ventilation being greatly improved. The lower steps, and the general step arrangement, decreased step accidents to the minimum. In fact, a step accident has been rare on this line since the change was made. The saving from this safety standpoint can hardly be estimated, but let's see where there have been savings which were easily determined.

Energy Saving Proves to Be an Important Item

The maximum power demand of the old cars was approximately 325 kw., while that of the lighter cars is only 204 kw., at 600 volts. The peak demand on substations has been reduced accordingly. It will readily be understood that this is due to the weight, gear ratio and the type of motor on the new cars.

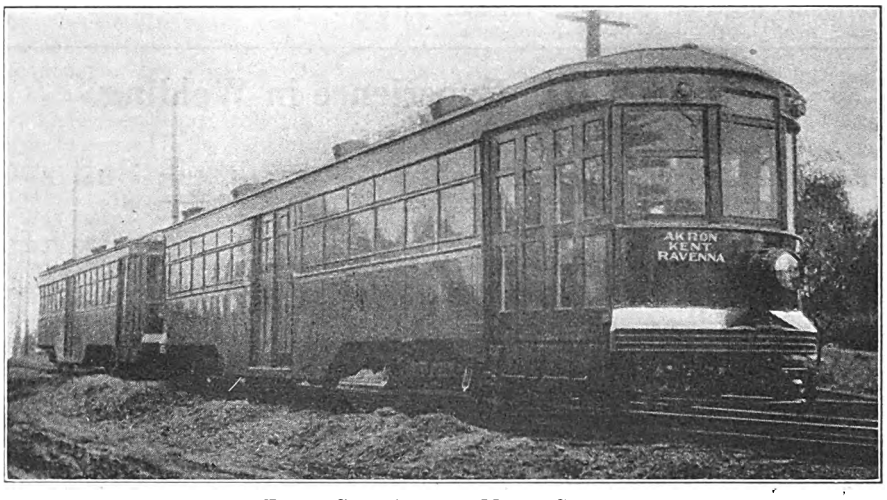
The energy consumption of the old cars was 3.95 kw.-hr. per car-mile while that of the new cars is 1.97 kw.-hr. per car-mile, measured at the d.c. substation bus.

Mechanical as Well as Electrical Maintenance Reduced

So much for the energy consumption. Almost everybody felt that it "stood to reason" the energy consumption would be considerably less. But what of the maintenance? Note this comparison; From Nov. 1, 1920, to Nov. 1, 1921, only one armature was rewound and one repaired on the lighter cars at a total cost of less than $100, while the armature repairs alone on the motors of the old cars from Nov. 1, 1919, to Nov. 1, 1920, was $11,000! This heavy maintenance was due to the extreme grades and high gear ratio of the old cars. Of course, the motors on the old cars were not new motors but every shop man knows that the age of a motor does not materially affect this type of repairs. Here was a saving of $10,900 in twelve months, which amounts to almost a thousand dollars a month.

But that is not all. The lighter trucks and car bodies are more easily repaired, and repairs are made at a lower cost. For example: A gang of three men was required for work on the trucks of the old cars while it has been found that the same class of work on the new cars can be done easily by two men. The old maintenance for 1919-1920 was 5.28 cents per car-mile. This figure corrected for a reduction of 25 per cent made in wages brings 4.62 cents per mile for the old cars under present working conditions. For the new cars with approximately a 35 per cent reduction in weight, the maintenance was 3.21 cents per car-mile, or a saving of 1.41 cents per car-mile. Multiplying this by the Akron-Kent-Ravenna car mileage of 625,539, makes an annual saving on mechanical maintenance of $8,758. To this is added the known saving of $10,900 for armature repairs, giving a total of $19,658 maintenance saving in excess of the energy saving. But even that is not all. The cost of repair parts is considerably lower when it is necessary to purchase repair parts.

Let us go a little farther. The old cars were equipped, as previously noted, with K-34D control and, of course, operated in single car trains. As stated in the beginning, one of the chief reasons for the company deciding to go to the multiple-unit control was to provide increased service and at the same time get away from single-car train operation, and, therefore, make for the safety of the passenger. For in so doing the danger of rear-end collisions (and every operating man realizes the gravity of running trains in sections on a single-track road) was practically eliminated. The new cars with multiple-unit control are operated in two-car trains continuously during the rush hours, and at all times during the summer months to the Brady Lake summer resort. Only three platform men are required on a two-car multiple-unit train instead of the four men required when the old cars ran singly in two sections. This operation effected a saving of 112 man-hours per week during the 17 weeks of the summer and an average of eighty-four man-hours per week during the thirty-five weeks of operation on the winter schedule. As the average rate of pay is 50 cents per hour, the annual reduction in platform expense is $2,422. This two-car train operation also reduces street congestion, which you may readily see also reduces the accident hazard.



These Cars Are the Money-Savers

Various Roadway Savings Have Been Made

And then there is the maintenance of roadway. We have no absolute figures showing actual comparison. It would be unfair to take figures on the cost of maintenance for the last twelve months and compare those figures with the figures of the preceding twelve months, for entering into the savings that have been made are the reductions in material costs, labor and other items. A separate accounting of the material and labor used on this particular division has not been kept, but the maintenance of roadbed has been greatly less during the last year. Assuming that rail cost $6,000 per mile and will last ten years under the operation of the 62,000 lb. car, all conditions being equal, the rail on which the 42,000-lb. car is operated should last proportionately longer. Experiments on the strength of steel have proven that steel will break more easily under much fewer heavy blows than a large number of light blows. Upon this basis, our engineering department has figured the saving in the wear and tear of rail alone at approximately $250 per mile. per year.

Concerning ties, the average maximum life of a good grade of tie is approximately nine years. In other words, a tie will decay during that period to a condition where it is of no value. In the running of heavy cars, the rail will wear itself into the tie, thereby considerably shortening the life of the tie as compared to the life of the tie over which the lighter cars are operated. How much this amounts to is difficult to figure accurately, but it is safe to assert that the ties over which lighter cars are run will last at least one year longer. This being true, the average renewal per year under heavy traffic would be 300 ties per mile. Under the lighter traffic it is but 270 ties per mile, making a net annual saving of 30 ties per mile. At an average price of $1.30 each, this amounts to $39 per mile per year.

There is also a considerable saving in the reballasting of roadbed. What this amounts to, so far as our experiments go, is but an estimate, but our engineers are a unit in declaring that the saving is easily 10 per cent per year. Track and roadbed, labor and ballasting material costs have been approximately $750 per mile, and upon that basis the 10 per cent saving amounts to $75 per mile. The apparent saving is, therefore, to be summed up as follows: Rail, $250; ties, $39; maintenance of roadbed, $75; total, $364 per mile, or more than $6,700 annually for

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the roadway of the entire line. Summarized, the savings are as follows:

ANNUAL SAVING OF OPERATING EXPENSES	
Energy consumption	$18,578
Maintenance of car equipment	19,658
Maintenance of roadway	6,770
Reduction crew expense by train operation	2,422
Total annual saving	$47,428
INVESTMENT	
Purchase price of 15 new cars at $15,109 each	$226,635
Return on the investment by savings	19.36 per cent

In addition to these, there were other savings which are difficult to evaluate. With the old cars, pull-ins were frequent and many regular trips were lost with consequent reductions in income. The new cars have been giving excellent service. In view of the competition of a motor bus which parallels the line the entire distance, there can be no question but the irregular service that certainly would have existed through the continuation of the old cars would have diverted much traffic to the bus line.

It became necessary after the cars were in operation a few weeks to lengthen the running time five minutes, but this in no way affected service. It merely reduced the layover at the end of the line. Today we are maintaining, satisfactorily, a thirty-minute headway without a single material complaint.

We have bettered the service by means of the two-car trains; we have eliminated the accident hazard; the cost of energy has been greatly cut down; less men are required for operation; a big saving made in car maintenance; a reduction found in the roadway upkeep; and the Akron-Kent-Ravenna line is really the only line of the system on which the earnings have maintained a straight line across the chasm of business depression that has swept Northern Ohio during the last eighteen months.

Three Years Experience in Welding Worn Flanges*

Results Obtained Have Been Very Satisfactory — Wheel Mileage Has Been Increased Greatly at Small Cost and With No Bad Results From a Safety Standpoint

BY E. B. GUNN
Superintendent of Transportation and Equipment
Western Ohio Railway, Wapakoneta, Ohio

OUR practice of building up worn flanges of steel wheels has now been in use for three years. During this period we have repaired flanges on more than 160 pairs of wheels with very satisfactory results except for three wheels referred to in a paper which I presented at the C. E. R. A. summer meeting in 1920. (See ELECTRIC RAILWAY JOURNAL, July 17, 1920, page 129.)

The method used by our company has not been changed since we started, except that we try to do better and neater work. We have been fortunate in keeping the same operator that we had at the start and I feel that a good operator is most necessary for insuring good work, although the welding equipment used must be of a type to insure proper regulation.

We have used the same welding machine for more than three years, and this machine has been in constant service not only in welding wheels but for maintaining the bonding of our 120-mile line, and such other shop work as we have, as well as for doing a good deal of outside welding work. Proper control of the arc is very important in the welding of worn flanges. If the arc is too intense, overheating of the steel in the structure of the wheel might injure it; or if the arc is too short the proper amalgamation is not obtained and shelling results, for the metal in that case is simply laid on the steel structure and is not properly amalgamated.

A good average record is that for a pair of wheels placed on passenger car No. 18 in September, 1918. These wheels were 36 in. diameter, rolled steel and manufactured by the Carnegie Steel Company, Cleveland, Ohio. The car was operated 65,667.9 miles before the wheels were taken out for sharp flanges. These wheels were welded, turned and put back under the car, and made 57,591.3 miles, after which they were again taken out for worn flanges. After again being welded, turned and put back they made 44,025 miles, and apparently these wheels will be good for 15,000 miles more before they are taken out. There is stock enough in the wheels again to weld and turn them, and they should make a total of 242,284 miles. These wheels will be welded and turned and will be installed under a freight trailer, and be used in that service for several years. Before using the welding process our wheel mileage did not average more than 140,000 to 150,000 miles, and then the wheels would have to be scrapped, for they could not be turned for our freight trailer service as they did not have enough stock. The only repairs necessary before they are put into trailer service, is to shape the flange, weld and turn them and pair them up with other worn-out wheels as to size.

The expense of welding the wheels mentioned was, approximately:

50 lb. welding metal at 8 cents per pound	$12.00
130 hours welding operator labor at 60 cents	18.00
150 kw.-hr. at 2½ cents	3.75
10 hours machinist labor at 60 cents	6.00
	$39.75

This would take care of the extra work involved in welding the wheels and turning the flanges after welding, over the cost of simply turning the wheels if no welding was done. This makes a cost of $4.97 per wheel, or $9.94 per pair. This is not quite 17 cents per 1,000 miles for welding, on the basis of 60,000 miles additional wear.

One of the chief things that the operator must avoid in welding flanges is fast and too steady work as these have a tendency to overheat the metal in the wheel and to cause trouble with the structure of the steel.

So far we have had no broken or cracked flanges on any wheels that we have welded, and we have been using these wheels on all classes of our passenger cars. We also have been doing this work for the Dayton & Troy Electric Railway, the Dayton & Western Traction Company, and the Tiffin, Fostoria & Eastern Traction Company.

I feel that it has gone beyond the experimental stage, and that there is no question of the advisability of doing this work in any shop, either from the standpoint of safety or of economy. We feel that our company has saved more money from the system of welding flanges than from any other one economy introduced within three years.

*Paper presented before annual convention of the Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

How Flanges Are Welded on Winona Interurban*

BY CHARLES SIGLER
Master Mechanic Winona Interurban Railway, Warsaw, Ind.

NO MECHANICAL operation has been passed upon with more varied opinions than the proposition of building up or filling flanges on steel car wheels. In contemplating the work, none have cared to make any sacrifice of safety for economy. There are no text books today which give us any data or recommendations on this subject; neither do the manufacturers of the various welding equipments, nor the manufacturers of welding steels make any guarantee on this particular class of welding, and there are no wheel manufacturers who recommend or approve of flange welding.

About four years ago the writer made his first attempt of applying metal by electric welding to steel wheel flanges. These wheels were used under a low-speed heavy freight motor car. For some time the performance was watched very closely, not from a standpoint of economy, but of safety. As time went on the results were gratifying with regard to both economy and safety. Eliminating details of any of the experiments, none of which ever gave any trouble, but which led up to our present method of filling in flanges on steel wheels, I will try to give a brief explanation as to how the work is done, its cost and the results derived therefrom.

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Most all steel wheels are taken out of service on account of sharp flanges, and in nearly every case there will be one sharp flange on each axle while the other will have become much larger than the original.

In preparing wheels for electric welding or filling, the wheel with the worn flange is turned, taking ¾ in. of metal off the tread and in doing so ¾ in. of new flange at the base. The top of the flange is finished to proper contour, which leaves a right-angle groove in the flange about ⅜ in. deep, and parallel with the tread and ½ in. deep at right angles to the tread for a 1 in. flange. The other wheel is turned to the proper diameter and a new flange formed. If both flanges are sharp, the same preparation is made for filling both flanges.

In filling the flange the axle is placed on end, one wheel resting on the floor. This method brings the work to a convenient height for the operator. A ¼-in. welding rod has been found best suited for this work. The welder completes a flange in one hour and forty-five minutes, using 7¼ lb. of welding steel and 120 kw-hr. The total cost per flange is as follows:

Welder's time—1 hour 45 minutes at 50 cents.	$0.88
Steel—7¼ lb. at 25 cents	1.82
Current—120 kw.-hr. at 1½ cents	1.80
Total	$4.50

These figures are based on actual experience, and on this basis I will try to show that filling flanges with electric weld is worth while.

About 55,000 miles is a fair average between turnings on 37-in. steel wheels and during this service the tread wears ¾ in. Then we get about 13,750 miles for each 1/32 in. of tread wear. In order to make the wheel suitable for service again, using the filled flange, ¾ in. additional metal must be removed from the tread to properly shape the flange for filling. This brings the mileage down to approximately 6,875 miles per 1/32 in. or 55,000 miles per ½ in. of tread worn and turned off.

Not using the electrically-filled flange, the first results would remain the same, that is: 55,000 miles with ¾ in. of tread wear. In order to form an entirely new flange, it is necessary to remove about ¾ in. of metal from the tread, making a total of 1 in., with a mileage of 3,437 per 1/32 in. of tread metal worn and turned off.

The mileage per 1/32 in. of wear, no doubt, will not hold good throughout the life of a wheel. Nevertheless, the ratio of 1/32 in. of tread wear between wheels with filled flanges and turned flanges will remain the same. Experience has proved that a filled flange will last as long as a turned flange, a fact which makes it possible to double the life of a steel wheel with an additional cost of $15 for filling flanges four times.

Considering past experience, I do not hesitate to recommend both from a standpoint of safety and economy the practice of filling flanges on steel car wheels with an electric welder.

Contact Shoe vs. Trolley Wheel*

The Relative Merits of the Sliding Contact Shoe as Compared with the Standard Trolley Wheel Are Discussed

By H. Savage
Assistant to Master Mechanic (Detroit) United Railway

I DO NOT know of any railway that has tried the sliding contact shoe in city and light suburban service, nor do I think there is any necessity for abandoning trolley wheels for slides of present design. The standard trolley wheel has ample capacity to transmit the current required for equipment in this service, and the speed is not high enough to cause them to leave the wire, but in high-speed and heavy low-speed interurban service it is universally known that the trolley wheel never was satisfactory. While there have been many changes in the design of trolley wheels to meet local conditions, the two principal points of objection to the wheel still remain, that is, lack of contact surface on the wire, and the frequency of the wheel leaving the wire in high-speed service.

I have seen many trolley wheels that have increased in weight from 2 to 4 ounces in approximately 100 miles run. This is caused by copper from the trolley wire being deposited in the groove of the wheel. This, to my mind, is very injurious to the trolley wire and leaves the surface very uneven. This increases the size of the arc between the wheel and wire, which is quite general with heavy high-speed equipment. If steel trolley wire is used the arcing is very pronounced under most favorable conditions.

Observation on Two Lines Using Different Wheels

My observation for a period of about three months of two lines having approximately the same mileage and class of service may be of interest. One line uses the standard trolley wheel, and the other the sliding contact shoe. On the line operating with trolley wheels, the overhead equipment was damaged by the trolley leaving the wire twenty-seven times, and a total of 3,200 ft. of wire was torn down. I am unable to state the damage done to crossarms, span wires and trolley hangers. The following car equipment was used: Trolley poles, fifty-seven; trolley rope, 2,400 ft.; trolley wheels, two hundred and fifty; trolley retrievers, twenty-two. And there was a total delay to service of nineteen and three-quarter hours.

On the line using slides there were seven trolley poles, 280 ft. of trolley rope, three trolley retrievers, and eighty-two sliding contact shoes used. There was no damage to overhead equipment, other than that caused by wear, and no delays to service.

I do not know of any person in possession of information that will show the cost of replacing overhead equipment caused by the wear from sliding contact shoes. From my experience the wear on overhead equipment caused by the use of the sliding contact shoe is slight. An examination of trolley wire where contact shoes had been used continuously for the past twenty-three months showed that the wear on one-way wire is very slight, the wire having a brownish color, slightly glazed, while on wire in two-way operation the wear is more noticeable, but not excessive. The brownish color, and glaze do not appear on this wire.

In comparing the merits of the two devices the sliding contact shoe overcomes all the objectionable points of the trolley wheel. It is also known from numerous tests that the sliding contact shoe has about two and one-half times the life of the standard trolley wheel. If we take into consideration all the damage caused by the trolley wheel as compared with the wear on overhead equipment caused by the sliding contact, I am satisfied that the sliding contact is by far the more economical device to use.

After numerous tests we have found that the forged steel slide has the longest life, and causes the least wear on trolley wire. We also found that on wire where wheels and slides are both used the wear is much more noticeable than if slides or wheels alone were used. This is also true for a short time after trolley wheels are replaced by slides.

It is my opinion that the slides have not reached the point of perfection that they will in the near future. Changes will be brought about which will reduce the initial cost of the slide and also reduce the liability of wear on overhead equipment, which to my mind is greatly exaggerated at the present time.

*Paper presented before the Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

Sliding Shoe a Better Collector*

By C. M. Bange
Master Mechanic Interstate Public Service Company, Scottsburg, Ind.

MY PAST experience with the sliding contact shoe has consisted merely of several tests to determine if a saving could be made by its use, which test at that time did not make the showing expected. Since coming to the Interstate Public Service Company, I find the sliding contact shoe filling the place of the trolley wheel where the current carrying capacity is the prime factor required. This the sliding shoe successfully performs while the trolley wheel proves a failure.

When under headway our limited cars draw approximately 400 amp. and

*Abstract of discussion on "Merits of Sliding Contact Shoe" at the annual convention of the Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

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from 900 to 1,200 amp. when starting. It was found that under these conditions a standard 6-in. trolley wheel would build up in the groove instead of wearing away. Different tensions from 30 to 35 lb. were tried out but the wheel would collect copper from the line to a depth of about $\frac{1}{16}$ in. in 300 to 400 miles. Difficulty in keeping the wheel on the wire was also experienced. The schedule speed is 33 m.p.h. and the running speed at times reaches 60 m.p.h. or better. A wheel running under these conditions very soon becomes out of true and causes the drumming noise with which all are familiar.

The sliding contact shoe overcame all these objections; arcing at the wire is hardly noticeable even on a dark night; speed has very little effect on its sticking to the wire and its operation is not noticeable from the interior of the car. The one real objection is in backing up, for then it is necessary to have some one at the rope, especially when the shoe has worn in grooves.

Whether a lower tension than 25 lb. would still further improve its service I am unable to say, for that is the lowest tension obtainable on the trolley stand in use.

Opportunity for Improvement

There are several shoes on the market which manufacturers claim will back up as perfectly as go ahead, but on those I have tested there is still opportunity for great improvement.

From a mechanical and electrical standpoint the sliding contact shoe seems most nearly perfect. When new, most of the shoes that have come under my observation, afford approximately $\frac{1}{2}$ in. of contact with the wire, and after a few hundred miles of operation this is increased to 1 in. and more until worn out. As the shoe does not revolve, it is possible to connect it directly to the harp with a shunt, thereby eliminating all pin and bearing trouble. There are also fewer parts to maintain. And careful inspection of the trolley wire has shown no undue wear from the use of shoes.

The trolley wheel has been developed to a high point of perfection and where the current demand is not excessive, nor the speed too high, it will develop splendid mileage. But care must be observed to insure proper lubrication, and the contact springs must be properly fitted and inspected or the wheel will give out at the hub even before the groove has worn to the scraping stage. When new, only about $\frac{1}{8}$ in. bears directly on the wire and this will not materially increase as is the case with the sliding contact shoe. If a wheel is even slightly out of true, or balance, speed enters seriously into its current collecting properties.

The sliding contact shoes used on our cars equipped with four 150-hp. motors have averaged 2,400 miles. With the standard trolley wheel operating on cars equipped with four 75-hp. motors the average has been 2,800 miles, while on those cars equipped with four 50-hp. motors, the shoes have made approximately 3,000 miles.

A Scientific Study of Trolley Wheel and Shoe Losses*

By D. D. Ewing
Professor of Electric Railway Engineering
Purdue University, Lafayette, Ind.

In any comparison of the relative merits of different types of contact devices we must keep clearly in view the practical requirements which a successful contact device must fulfill. In brief these requirements are as follows:

1. It should stay in intimate contact with the trolley wire regardless of the wire position either in a lateral or vertical direction, and regardless of the wire condition, new or worn, clean or fouled. Also it must "stay put" at low speed and at high speed, moving forward or backward.

2. It should not cause excessive wear of the contact line.

3. It should be able to collect without damage to itself or the contact line currents ranging from 50 to 1,500 amp. at low speed and from 150 to 300 amp. at 60 or 70 m.p.h.

4. It should be cheap both in first cost and maintenance and it should be readily replaceable. Also it should have long life.

As some of these requirements are incompatible, the actual device must necessarily be a compromise.

The operating, equipment and power departments of the railway, all are interested in the contact device. The operating department is responsible in a large measure for the trains or cars being on time. From the point of view of this department the device must be one which will stay on the wire under all conditions of service. It should not be necessary to make stops to replace the trolley, and trainmen have a natural and well-founded objection to clambering up on top of the car in foul weather. The equipment department is interested in the first cost, maintainence and replacement of the device and also objects to having trolley poles bent and trolley bases loosened or torn away. The power department also scrutinizes the trolley wire for wear and objects to having a trolley pole running amuck in the overhead system.

To merit commercial success the contact device must meet the just requirements of all three of these departments and the best test is the test imposed by every-day service on the cars. As regards the life of the device and the wire with which it makes contact, laboratory tests are of some value in indicating factors which affect life. During the past ten or fifteen years we have made a number of tests on trolley contact devices at Purdue University. The results of one series of tests is illustrated by the data given in Table I for a 6-in. U-groove wheel collecting 100 amp. trolley tension of 30 lb. They are approximate averages as read from graphs plotted from the test data. The friction loss includes both the trolley wheel bearing loss and the wheel-to-wire contact loss. It will be noted that the electrical loss at the contact is greater than the mechanical loss.

TABLE I—TROLLEY CONTACT DATA

Speed	Electrical Losses: Wheel-Wire Contact	Electrical Losses: Bushing Contact	Mechanical Losses Friction
10 m.p.h.	10 watts	13 watts	20 watts
15 m.p.h.	50 watts	17 watts	26 watts
20 m.p.h.	80 watts	40 watts	36 watts
25 m.p.h.	125 watts	80 watts	50 watts

With a car running at 60 m.p.h. a 6-in. trolley wheel will run at a speed of approximately 3,360 r.p.m. provided there is no slippage between wheel and wire. There is undoubtedly some slippage. We would expect the slippage to be more or less dependent on the relative frictional losses at the bearing and at wheel contact. A number of different investigators have attempted to measure the slippage but the results secured have not been very satisfactory because the device for measuring slippage affects the quantity being measured.

Several years ago we made tests on a number of interurban cars in order to determine the loss at the contact. We found that at speeds between 35 and 45 m.p.h. with a 6-in. wheel collecting 200 amp., the loss ranged from 400 watts for smooth running to momentary values of 15 kw. for occasional arcs at trolley hangers and rough spots on the trolley wire.

Later we made a number of tests with both wheels and shoe, measuring the voltage drop at the contact with a graphic recording voltmeter. We found that the chart of the meter was a true record of the rough spots on the wire, each rough spot being indicated by a "throw" of the meter pen. At higher speeds the "throws" were large in magnitude and numerous. Summarized, other results of these tests were as follows:

1. The graphic meter record shows increased voltage drops at practically every hanger.

2. There was far less arcing with the sliding shoe than with the wheel trolleys.

3. The power loss at the contact for smooth running was practically the same for all devices.

4. The ability of the shoe to stay on the wire was largely dependent on the angle between the trolley pole and the wire. At an angle of approximately 20 deg. the shoe was as satisfactory in backing as the wheel. With larger angles, such as 45 deg. the shoe was not very satisfactory when backing.

5. In general the shoe ran quieter than the wheels and the irritating vibration from the trolley base which so often manifests itself when the car is running at a greater speed than 35 or 40 m.p.h. was not as great with the shoe as with the wheels.

It may be said that the loss at the wheel-to-wire contact is not in itself important. Its importance lies in the fact that the wear on a part is largely a function of the energy expended on the part. The arcing causes pits or rough spots on both the contact device and the wire and these rough spots in turn promote wear by abrasion. Even

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when the wire is smooth and no arcing occurs the electrical loss causes highly localized heating and this in turn causes tiny pits and thus roughens the surfaces in contact. It is possible that wear might be reduced somewhat by the use of a proper lubricant properly applied to the contact surfaces.

Sliding Contact Superior on Interurbans*

By J. W. Osborne
Superintendent of Equipment Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

THE interest shown in the sliding contact shoe is evidence in itself that the trolley wheel is not satisfactory for interurban service at least, and that a better trolley device would be welcomed. For interurban service I believe that most of us consider a sliding contact far superior to a wheel, but that the shoes have not yet been perfected.

For high-speed, heavy interurban service, for motor car trains with only one trolley pole up, and for electric locomotives some form of sliding contact shoe becomes almost a necessary as shown by the experience of such roads as the North Shore Line and the Interstate Line.

Many object to the use of the slide because they think it does more damage to the wire than is done by the wheel. In this connection I have been told that some have observed that on grooved trolley wire presenting a smooth running surface the wear caused by the slide is not as great as from the wheel, but that on round wire the slide soon wears away the edges of the ears and lets the trolley drop. It seems to be a question not yet decided whether the wheel with its poor contact and severe arcing is not more destructive to the trolley wire than the slide with its reduced tension against the wire, good contact and practically no arcing.

In testing the slide the rest of the trolley apparatus should be given careful attention. The slide can be operated with much less pressure against the wire than the wheel, due to its smooth sliding contact as compared to the rolling, jumpy contact of the wheel. This lessened pressure between the shoe and the wire should materially reduce the wear on both. A new type trolley base with approximately uniform tension for all heights of wire will undoubtedly give better results than the old type base in which the tension is reduced as the pole rises. I think a long, flexible trolley pole will give better results than a short, stiff one.

In regard to the performance of the sliding shoe as compared with the wheel, my experience has been that it rides the wire much better, does away with the objectionable noise and vibration so common with the wheel, cuts through sleet better, and gives greater mileage. In fact, the shoe does better than the wheel in every way except in backing up; and with so many working to improve the slide I think it will be but a short time until some design is perfected that will not have this defect. We are now trying out a slide fitted with a small wheel at the back which does permit of backing up without having some one at the rope. All the motor cars, about twenty-five in number on one division have been fitted with these slides, but we have not conducted the test long enough to make a report except to say that one of these slides ran thirty-four days for a total of 8,773 miles.

I am of the opinion that in the near future some form of sliding contact shoe will be developed that will replace the wheel for interurban service.

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Reclaiming Joints in Indianapolis*

Results Obtained and Costs of Reclaiming Track in Paved Streets with Three Types of Welding—How Rebuilding Has Been Deferred

By T. H. David
Principal Assistant Engineer, Indianapolis (Ind.) Street Railway

EXCEPT for a few locations, the track in Indianapolis was largely reconstructed during the reorganization period from 1899 to 1902. A very large amount of this reconstruction became necessary because of the increase in weights of city cars and the advent of the heavier type of interurban cars which operate over the city tracks. Indianapolis has a total of approximately 153 miles of revenue track of which 88.6 miles or 58 per cent is used by city cars only and 64.3 miles or 42 per cent by city and interurban cars. This track construction is classified as follows: 1st Class—90-lb. rail and heavier on concrete base; 62.9 miles; 41 per cent; 2nd Class—90-lb. rail and heavier on gravel ballast; 74.8 miles; 49 per cent; 3rd Class—Rail of lighter sections on gravel ballast; 15.2 miles; 10 per cent.

Of this total revenue track, 14 miles, or about 9 per cent, is comprised in special work layouts and curves. We have about 250 special trackwork layouts in the city, of which thirty are in the downtown loop district. Of the total mileage involved in these layouts, interurban cars operate over 50 per cent in the loop and 33⅓ per cent in the districts outside the loop. These thirty layouts represent an expenditure of $300,000 with nearly $100,000 additional for pavement.

Quarter Billion Ton-Miles in 1920

During the year 1920 the mileage made was as follows: City cars, 12,490,988 miles; interurban passenger cars, 984,502 miles; interurban freight cars, 152,301 miles; total, 13,627,791 miles. In terms of ton-miles this amounted to 241,950,438 ton-miles for city cars, 35,122,819 ton-miles for interurban, and a total of 277,073,257 ton-miles. This is an average of 1,800,000 ton-miles per mile of track. These figures are for dead-load only, and they do not include any miscellaneous cars such as work cars, sweepers, etc.

Our experience has shown that first-class track in paved streets should not require maintenance for a period of ten years when subjected to a normal amount of traffic of, say, three-minute headway with city cars or about eight years if hourly interurban service is carried in addition.

Experience With Lorain Weld Joints

In 1913 we welded 3,000 joints on both old and new tracks, using the Lorain electric weld. This type of joint proved very serviceable and has prolonged the life of track so reconstructed. We have had several instances where the wear on the ball of the rail has decreased its section until it no longer had sufficient stiffness to carry heavy loads and failed by fracture immediately below the ball at the juncture with the web, the joints remaining in fairly good condition. One case is the track on College Avenue between Massachusetts Avenue and Fall Creek, consisting of Lorain Section 80-335 7-in. high T-rail laid in 1902. This was the first concrete construction, full tied track in the city, and carrying probably the greatest mileage and tonnage of any track outside the loop district. There is no doubt in our minds that the welding done on this in 1913 prolonged the life of the joints and saved the maintenance cost of the pavement which usually gives the first evidence of joint failure. The paving on this street, excepting at the joints which was naturally repaved with the welding, and excepting 18 in. outside the rails relaid at the time of street reconstruction, is the original paving laid in 1902. Up to a year or so ago the appearance of wear was uniform, that is, the dip and bad pavement at each joint, usually identified with bolted construction, were missing.

Failure of this method of welding usually occurs by ordinary vertical break immediately adjacent to the weld, or the ball of the rail breaks out over the weld. This has been our experience with old rail and we think it partly due to stresses resulting from lack of periodical grinding. The welds made on new rail up to this time have been very satisfactory and the breakage has been considerably less than 1 per cent. One track containing 250 such welds

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with about eight-minute city service has had no breaks.

Arc Welding on Old Track Reasonably Successful

From 1914 to about 1918 no welding of new track was done, but considerable resistance arc welding was done on old track of all sections. This method of welding has proved reasonably successful and has only been resorted to in old tracks which we hoped to reconstruct in the near future. Some 14 miles of 70-lb. track, most of it twenty years old, has been welded since 1912 with the arc welder. Our method has been to cut the base of the angle bar on the gage side and invert the bar on the outside, thus giving the outside of the ball a support. In some cases where tracks were out of surface we have re-tied the joints and a few feet each side, tamping the joint and leaving the quarters suspended for a day or so under traffic. By this method a considerable amount of the surface bend can be ironed out. Instead of using plain gravel for this work, we used a mixture of cement and gravel in the ratio of about 1 to 7. In some cases we bonded around a joint of this type in order to insure the proper return. Some of these welds have proved exceptionally good while others failed, the greater percentage failing by the weld breaking loose. It appears that this class of weld can be made to give good results, but the personal equation enters to a greater extent than in some of the other methods of welding.

Another piece of track reclaimed by the use of the arc welder consisted of 90-lb. Lorain Section 206 in 30-ft. lengths which was very bad looking before reclamation. The rail was laid in 1894 and on very little ballast, and while small repairs were made in 1910, a complete reclamation was made in 1916 and 1917 with very satisfactory results. Twenty-five per cent of the ties were renewed, mostly at joints, and every joint was welded. In some cases where bolts were loose, the plates were removed and cleaned; and if the bolts were tight, the old plate was welded by adding a ½-in. square rod along the top of the plate to carry the welding strip. Tie plates were put under all joints, these plates being old 9-in. flat joint plates. All cups in the ball of the rail were filled by arc welding and then ground to surface with a rotary grinder. The track was very smooth riding when completed and the results were gratifying. This track carries 20-ton cars and is a short line with a ten-minute service. No bonds were used, and as a rule they are not used in this type of weld except on trunk returns. In all, some 500 joints were welded at a cost of 90 cents per joint for trackwork, and as the entire street was repaved with brick and stone liners, the paving was $1.50 per square yard. This low cost per square yard is due to the fact that portions of the paving base were not disturbed. The total cost was $15,460 or $2 per lineal foot of single track.

As usual, dry mix was used to bring some joints up to proper surface. This small expenditure per foot has again put this track in condition to last at least eight to ten years with present traffic conditions. Considering the fact that the rail at the time of welding was twenty-two years old, we cannot expect much more. Up to date we have had only one break, this record being due perhaps to the class of welder we had. In this case credit should be given to the personal factor in obtaining the foregoing results.

Two years ago a double-track electric over single-track steam 90-deg. crossing made of solid manganese broke down at several of the frog points and appeared to be destined for the scrap pile after only six years service. As a last resort we tried arc welding, using gasoline and a wire brush to clean fractures thoroughly. The points were then built up, soft steel being used and applied in thin layers, each layer being pounded with a hammer while hot to compress the metal. This process was continued until it was built up to the last ⅛ in. and then hard steel of the grade recommended for manganese work was added. This crossing remained in fair condition for some time but in the two years the points have been rewelded twice by the foregoing method, as the welded portion disintegrated by flaking off.

Thermit Welding Costly But Justified by Results

In 1917 we became interested in Thermit welding, but up to 1919 the use of it was limited to combination joints and built-up frogs, the latter being the result of the high prices prevailing for special pieces. If the Thermit method of rail fastening is used, we find that there are three grades of rail that can be welded, with some question as to the wisdom of so doing with the last two: (1) new rail; (2) rail that has been in service for about eight or ten years with moderate traffic, and joints (bolted type) beginning to cup and get loose; and (3) rail of the same age or older that has been subjected to severe traffic.

In the last couple of years we have Thermit-welded two streets of the latter two types to reclaim them, with the hope that our judgment will be vindicated. On Central Avenue from Tenth to Nineteenth Streets, approximately 3,700 ft. of double track was reconstructed in 1911, Lorain Section 95-297 being used on white oak ties laid on concrete base. During the last year or so some 40 per cent of the joints showed evidence of pounding and breaking the bond with the immediate pavement. As we did not wish to postpone repairs until rail breakage developed we decided to "Thermit" all joints that showed any evidence of pounding and regrind all of the 280 joints.

A total of 114 joints were welded and ten cases of broken rail were found, these breaks occurring along the line of the bolt holes. The actual welding was done between midnight and morning, the joints being excavated and back-filled during the day on account of the street being narrow and the impossibility to keep automobiles from driving into the excavations. The original joint plates were the eight-hole continuous type, thus leaving about ⅜ in. space between the base of the rail and the tie after welding. Tie plates ⅜ in. x 8 in. x 10 in. were used to give bearing and spot-welded to the base of the rail to hold them in place, as in most cases the ties were cut away to permit the necessary width for the moulds, the original spacing of ties being too close and we did not desire to excavate and respace them. This work of 114 joints was accomplished at a cost of $13.56 per joint for track and $9.84 per joint for paving; total, $23.40 per joint. As these rails were all 62 ft. in length it made the cost per foot of track about 76 cents.

Records show that the number of scheduled cars operating over this track in the ten years was 930,185 or 3,720,740 car wheels on each rail. As the cars all weighed 20 tons, it gives us 18,603,700 tons of weight per track.

This welding was completed in July, 1921, and we have had two breaks since, both of which were rewelded by waxing the joint and pouring additional Thermit.

The track on Massachusetts Avenue between Alabama Street and College Avenue is the extreme case in the types of track formerly referred to. This track was constructed in 1910 of Bessemer rail, Lorain Section 91-375, 7 in. high on white oak ties imbedded in concrete or monolithic from sub-grade to paving base. This track became so rough at the joints that it was decided to use Thermit in an effort to delay reconstruction at least three years, or for a period that would justify the expense.

The portion of the street used by vehicles was resurfaced in the summer of 1920 and this company relaid 18 in. outside the rails at that time, omitting the grouting at the joints until we could do the welding. Crossovers were placed on the streets and welding was started in October. As this is a trunk line and handles all cars to the northeast section of the city, or about sixty city cars per hour during tripper times, our welding was all accomplished between the hours of 9 a.m. and 3 p.m. and 10 p.m. and 5 a.m.; that is, in the off-peak hours.

As the work progressed we found every joint in the entire length of 2,700 ft. of street to be broken. We could not afford to remove the 18-in. strip of pavement only recently laid, so 6 to 10-ft. pieces were put in on the outside rails and welded, while the inside rails were cut and the rails were driven ahead. This method not only eliminated all the bolt holes but the cupped rails as well and also located the new joints on better ties, the old joint ties being cut severely in several cases. Where ties were cut, they were adzed and either steel or wood shims

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with holes drilled in them for spikes were added to bring to surface.

Before track and paving gangs had completed the work we had eleven breaks due to the new conditions imposed upon the rail in welding. Since then we have had six breaks, four occurring during last winter and two just recently. In each case they were rewaxed and welded. A recent inspection of this track shows it to be holding up in fair shape and it appears that the expenditure made, while large, was justified. On this street, 264 welds were made at the following cost: track, $30.00 per joint; paving, $15.00 per joint; total, $45.00 per joint. As the track rehabilitated consisted of 5,400 ft. of single track, the cost was $2.20 per foot, or a total cost of $11,772.87.

Operating statistics show that during the year 1920, 319,263 trips of city cars and 55,773 trips of interurban cars, or a total of 375,036 trips were made over this stretch of track. Therefore in the past ten years 15,001,440 wheels passed over each rail. This amount of travel is equivalent to 78,681,030 ton-miles for that interval. These figures, as in the previous estimate, do not include work cars, sweepers, etc., and are based on dead load of cars only.

In preparing this paper I have endeavored to relate our experience and some of the results obtained in the reclaiming of track by the different welding methods, and have avoided mentioning the rebolting as I believe most of us are only too familiar with that process. While I think arc welding by motor-generator set reduces the importance of the personal equation and should be mentioned, I regret that I cannot offer any experience in regard to its use.

Reclaiming Track in Paved Streets*

Use of New Base-Supporting Joints Under Old Rail May Double Life of Rail for $8 to $12 per Joint—Other Elements of Track Reclamation Discussed

By L. A. MITCHELL
Engineer Maintenance of Way, Union Traction Company of Indiana, Anderson, Ind.

THE reclaiming of track in paved streets is in reality the reclamation of joints. Track trouble starts at the joints, and the methods that have been tried to hold the joint construction so that the rail ends would not be ruined are probably as numerous as the sections of rail used.

The best method of repairing track is one that will extend the life of the track structure the longest, that is, giving you the greatest return on the investment. This best method these days depends to a very great extent on the money available to make the necessary repairs. It is not so much what shall be done as how much money can be spent.

In reclaiming track the effort is made to eliminate the joints as far as possible and make the rail continuous by making the joints just as strong as the rail itself between joints. This is done in various ways, such as placing steel plates on the ties under the rail at the joints; placing steel ties under the joints; buying new joints and applying to the old rail; welding the old joint bars to the rail; welding specially designed joint bars to the rail; taking old joint bars and inverting them and welding these to the rail; buying new base-supporting joints with larger bolts and redrilling the rail so as to construct an absolutely tight joint.

The Union Traction Company has approximately 60 miles of track in paved streets and approximately the same amount in streets that are unpaved. The track in paved streets as originally constructed of 70-lb. A.S.C.E. rail, 80-lb. A.S.C.E. rail, 6-in., 60-lb. rail Lorain Section 263, 6-in., 72-lb. Lorain Section 331, 5⅜-in. 60-lb. rail Illinois Steel Company 6012 and some of 40-lb. T-2 rail. Our interurban service operates over a little more than one-third of this mileage and naturally this portion of the track in paved streets has presented the greater part of our track problems.

The track on which our ordinary city service is operated has required comparatively little attention until from ten to fifteen years old, depending principally on sub-soil conditions. But the track in paved streets constructed for ordinary city service and then subjected to the interurban service has required attention in a much shorter time.

In repairing city tracks, of course, the first consideration is the foundation. Good drainage should be provided if possible and good sound ties under the joints. Then it is a question of how the joint itself should be dealt with. We first tried the installation of a plate on the ties under the rail which would hold the rails in position without deflection, and these plates were in many cases spot welded to the base of the rail. This proved a very satisfactory method, but of course did not remove all the pound due to the battered rail ends.

Another method that was tried with varying success depending on the age of the rail was the inversion of plain bars and spot welding them to the ball and the base of the rail. Practically all of the rail that was treated in this way was more than ten years old and considerably worn, and we had a large number of breakages in the rail in the web running along under the ball. This method gave us fairly good track for two to three years at a cost of about $4.50 per joint, including the labor of removing and replacing the paving as well as the labor and material in welding.

A few patent welding bars were installed and these gave very good service, and probably would have given better, had it not been for the age of the rail, which broke above the welded bar and under the ball of the rail. In many cases where we inverted the joint bars and welded them to the rail we found that enough of the ball of the rail had been worn off to allow the wheel flanges to strike the bar on the inside. This would ultimately break this bar loose from the rail. We then inverted only the outside bar.

On three or four occasions and at different locations we tried the installation of steel ties filled with concrete for repairing joints on old rail. Owing to the fact that the pound was not entirely removed from this joint we discovered that ultimately the foundation would be broken up and the steel ties bent so that they finally had to be removed. However, this same type of tie in concrete on new construction work with a tight joint was found to be as good as can be obtained.

Booster Ties on Old Rail

We have used a few of the so-called booster ties for old rail in paved street with very good results, probably due to the fact that this tie is cushioned and the shock is absorbed before being transmitted to the adjacent pavement. Spot welding has been used to great advantage in the repair of special work. Many times the life of a frog has been extended a year with an expenditure of $5 by building up battered down joints or filling spaces where pieces of metal have broken out.

I believe that the best results can be obtained on old rail by the application of new base-supporting joints with the same drilling as that in the rail so as to butt the end of the rails together and not allow for any expansion or contraction. The holes are then reamed out so as to use a larger bolt than the original. This bolt should be a machine bolt. The rail should be run tightly together before this joint is applied, and if the rail ends are badly battered the battered portion should be cut off and the rails run together and the joint entirely redrilled. In this way a joint mechanically tight is secured, probably having the same strength as the rail itself so that the wheel loads can be carried without over-stressing the metal. In addition to the application of the new joint the surface of the rail should be welded and ground so as to eliminate all pound. If the joints are kept tight, expensive repairs can be delayed by frequent welding and grinding of the surface of the rail.

Work of this kind can be done at a cost of from $8 to $12 per joint depending on the section of rail and the condition of the ends of the rail. I

*Paper presented before the annual convention of the Central Electric Railway Association held at Indianapolis, Ind., on Jan. 26, 1922.

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believe a joint of this type will last the life of the rail. These same results can probably be obtained by the use of the Thermit weld but at a slightly increased cost over the figures above mentioned. As yet we have not used this type of weld on our lines, due principally to the small number of joints to be repaired at a given location.

I believe that the secret of long life track is to construct an absolutely tight and rigid joint either mechanically or by welding so that any movement or deflection that takes place will be of the same character as takes place in the rail between the joints.

Track Reclamation Costs From Fort Wayne*

By H. V. Norford
Superintendent Maintenance of Way, Indiana Service Corporation

IN DECIDING on the work necessary for the construction and reconstruction of track in paved streets, it is necessary to take into consideration the fact that every track of permanent nature must have a permanent track foundation; all pavement should have a foundation sufficient to out-wear the rail and pavement, and all ties and other accessories, embedded in the pavement foundation must have equal life with it.

Engineers agree that in a track a pavement foundation if properly laid and drained will last from fifteen to thirty years, depending on the tonnage and frequency of car service and the amount of vehicular traffic passing over it. There is, however a large difference in the life of the track foundation and the pavement foundation and this prohibits the casting of the concrete track foundations and the pavement foundations in one mass. They are separated with a cushion of stone under the base of the ties, which gives a very resilient foundation for the rail. When the rail is worn out and the ties need replacing this construction permits this part of the structure to be renewed without destroying the track foundation. It also allows tamping and rewelding of joints if necessary without building an expensive patched foundation for some distance each side of the rail trouble. The pavement foundation, being only a filler between the ties and not cast to the subfoundation, is more easily removed than the other classes of concrete foundations.

Again on heavy traffic streets the pavement foundation and ties in this class of construction will out-last the rail, and if new rail is laid the only structure that need be removed with the rail is the pavement surface. This can be done without much additional loss to the sub-foundations in resurfacing joint ties or when welding joints by any of the modern methods.

When the pavement surface becomes worn to such an extent that it is impossible to make satisfactory repairs by patching our practice is to take up the entire surface of brick. Joints are welded if necessary and rails are respiked to proper gage and line and that portion between the rails paved with the brick taken up as far as the quantity of good brick reclaimed will admit. All new brick is placed on the 12-in. margin outside of the rail.

This construction provides a track foundation from 6 to 10 in. in thickness upon which is laid a track of either 6-in.—60 lb. 7-in—91 lb. or 100 lb. A.S.C.E. T-rail, as the tonnage warrants. White oak ties 6-in. x 8-in. x 7-ft. spaced 2-ft. on centers are laid upon a 2-in. tamping cushion of ¾-in. crushed stone with a 6-in. paving foundation between and around the ties. Pavement of either a 5-in. granite block or 4-in. vitrified shale block with a mixture of the proper amount of fire clay is used as the vehicular traffic demands; all pavements being sealed with cement grout of a 1:1 mixture. These methods of track construction and reconstructon are outlined so that the data given later may be more readily understood.

Mr. Mitchell in his paper said that "the best method to use these days depends to a very great extent on the money available for making necessary repairs." There is a certain definite point where maintenance should cease and the entire structure should be reconstructed. This limit should be definitely decided by the engineering department before any great amount of money is expended on a worn-out structure. In order to determine the definite turning point, the cost of reproduction not only of the entire structure but of every detail thereof based on current prices must be known together with the depreciation of each and every part thereof.

The following costs were compiled from Fort Wayne construction. From 1910 to 1913 Class A construction 7-in. rail and 8-in. track foundation cost $14.57 per lineal foot. In 1921 the same class of construction cost $25.12 per lineal foot of double track itemized as follows for an improvement of double track 1,832 ft. in length.

Track work	$17,747.00
Bonding	135.00
Track foundation	8,932.00
Drainage	952.80
Pavement and pavement foundation	17,588.86
Repairs to overhead work	666.00
Total cost	$46,021.66

This gives $25.12 per lineal foot of double track.

The increased cost of a few materials f.o.b. Fort Wayne were as follows: Rail in 1914 was $38 per gross ton and in 1921 it was $66 per gross ton, or an increase of 74 per cent. Cement in 1914 was $1.20 per barrel and in 1921 it cost $2.42 per barrel net, or an increase of 102 per cent. Ties, white oak, 6 in. x 8 in. x 7 ft. in 1914 were 78 cents each and in 1921 $1.38 each, or an increase of 77 per cent. Paving brick in 1914 were $20 per thousand and in 1921 were $42.50 per thousand, an increase of 112 per cent. Cast welded joints in 1914 cost $10.22 each, in 1921 they cost $17.84. Arc welded joints in 1921 cost $4.64 each by welding old joint plates with new 1-in. bolts to the rail and by welding an 8-in. x 12-in. x ⅝-in. steel girder plate directly under the joint. We also found by metering current used on each joint for approximately 540 joints that the power cost was 88 cents per joint.

Approximately 300 joints were welded by the Thermit process to 7-in. —95-lb. rail in the fall of 1920 at a cost of $15.23 each. This work was done under a three-minute headway of service and an average of twenty joints per day was made. Our Thermit welding varies from $14.60 per joint to $23.50 per joint, depending on the number of set-ups we are able to make per day. This includes finishing the joint but not paving. Paving on the above welding ranges from $4.10 to $8.60 per joint.

This year 7-in.—91-lb. rail costs $1.76 per lineal foot of track, and 6-in.—60-lb. rail costs 81 cents per lineal foot of track. Pavement in 1922 costs in Fort Wayne $5.36 per square yard.

In view of the above costs I believe we should thoroughly inspect and study depreciated track structures before applying a cost of from $2 to $5 per lineal foot of track for joint troubles, especially as in the very near future we may be required to repave or reconstruct this structure. Railways should hesitate before placing this additional welding expense on a track that is out of line and surface, with pavement loose along the rail so as to allow the surface water to penetrate the substructure. They should also hesitate before building welded special work layouts in their own shops to replace bad special work in track structures which with fixed overhead expenditures places the final cost of this work on a par with manufactured special work. I do not favor the "slapping" of any old kind of welding material on top of a rail ball that has from ten to fifteen years life in it in order to eliminate the pound on the joint, where the right treatment is to raise the joint properly, weld it and grind the ball to a true surface.

When the cost of reclaiming joints on old worn rail plus the pavement and repair costs per annum equal or exceed the interest and investment on a new structure, I think it is time to consider complete reconstruction.

*Abstract of discussion on "Reclaiming Track in Paved Streets" at the annual meeting of the Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

Welding Postponed Rail Renewal*

By R. J. Custer
Engineer of Way and Structures, Interstate Public Service Company, Columbus, Ohio

THE Interstate Public Service Company fortunately is not burdened with the large mileage of city tracks as are most companies, yet we have had our problems proportionately.

We have several miles of track in

*Discussion on "Reclaiming Track in Paved Streets" at the annual convention of the Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

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paved streets laid with 4⅞-in., 75 lb. T-rail over which operate 28-ton interurban cars. About 800 joints in this track were repaired by placing a ⅞-in. x 5½-in. x 24-in. iron plate under the joint, inverting the angle bars and spot welding the plates, bars and rail together. Surface welding and grinding finished the joint. This method of joint repairs has proved very satisfactory, considering the type of track to which it was applied. Very few breakages have occured. Those that have shown up were no doubt due to tension strains set up by the contraction of the rail, as it is impossible to get any anchorage in the concrete track structure with a rail of this depth.

In Columbus, Ind., we have about 3,800 ft. of track in a brick-paved street laid with a 4½-in. 60-lb. T-rail. The operation of 48-ton interurban cars over a track of this sort is very destructive of the track and pavement. This was a condition which we inherited and we had to make the best of the situation. We have managed to nurse this track along for the past three years with the liberal use of the electric welder. Without the aid of the welder we would have had to renew the rail. However, we are now experiencing a great number of rail breaks at the joints due, no doubt, to the heating effect of the welder. No particular method was used on the joints. Where bars were inverted for welding the flange of the angle bar was cut off with the oxygen flame before welding. We feel that we have about reached the limit in patching up the present rail.

We recently rebuilt 1,500 ft. of track in a paved street which had been in use for twenty-five years. This track was laid on white oak ties with an 8⅝-in., 90-lb. rail of the side-bearing or girder type. Under the track was a ⅛-in. concrete floor on which the track was surfaced and filled in with crushed stone, apparently a crusher run product. Over the crushed stone filling a 6-in. concrete foundation had been laid for the brick surface of the street. When we opened up the track we found that the ties were badly decayed and it was necessary to re-tie the entire track. We did not salvage more than twenty ties out of the original installation.

At each joint there was a decided cup in the end of each rail due to the bending down of the rail head. The joint bars were of the usual flat kind used on rails of the girder type, having twelve 1-in. bolts to the joint. We found all the joint plates absolutely tight, not only from the generous supply of bolts but in addition they were thoroughly rusted fast, so we took particular pains not to disturb them. After the track and pavement were completed we filled in the cupped rails with hard steel by means of the electric welder and ground them to a true surface. This gave us a nice, smooth track free from any pound at the joints, and with the light-weight cars which operate over it we should receive many more years of service from the original rail.

Special Joint Supports Prove Highly Satisfactory*

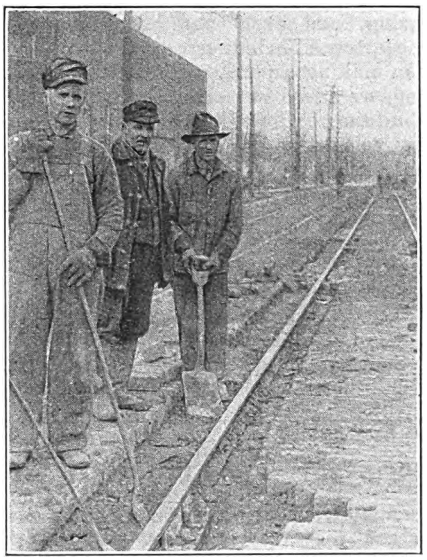
By M. Ackerman
General Manager Cincinnati & Dayton Traction Company, Dayton, Ohio

THE accompanying photographs show the condition of some track in Hamilton, Ohio, when reclamation was started and when the work was completed. The tracks shown had been repaired only twelve months before, when the old-time method of placing shims under the rail, and in some cases retamping the gravel under the ties, was used. The frequent repairs made necessary by this method ran our maintenance charges up very high, as we operate cars varying in weight from 15 to 50 tons.

These constant, unsatisfactory repairs made us look around for some other method, even though it might cost a little more, but we wanted something that would give us a more lasting job. We investigated the Dayton joint booster, because we believed it hit at the cause of our track and joint failures. As is generally known, this joint booster offers a broad bearing surface for the rail ends, and at the same time provides a means of using dry concrete under the booster itself for a foundation.

*Abstract of Discussion on "Reclaiming Track in Paved Streets" at the annual convention Central Electric Railway Association, Indianapolis, Ind., Jan. 26, 1922.

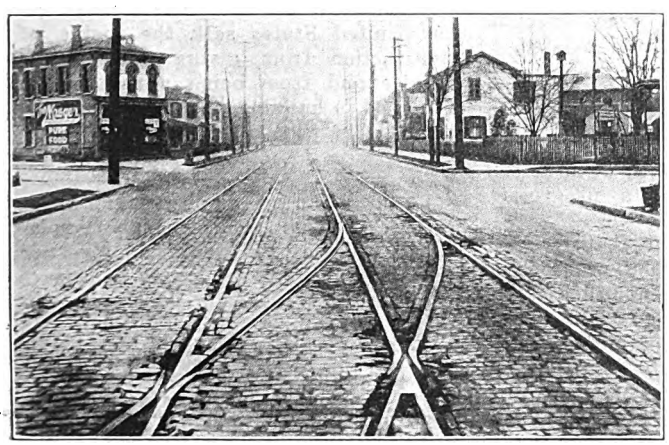
We have always believed that concrete offered the most lasting foundation for track, when it can be protected from the pounding which every track receives, especially at the joints. This protection is provided by the asphalt cushion, which is built into the booster



SHOWING HOW TRACK WAS OPENED UP FOR INSTALLATION OF JOINT BOOSTERS AND RELAYING PAVEMENT

itself. The heavy steel plate that is used on the booster block enabled us to weld the base of the rail to it, and we also weld the angle bars to the rail, thereby, overcoming the necessity of bonding. If the rail ends were battered, as they were in most cases, we filled up the cupped portion with new steel and then ground it down to a smooth surface.

Our work of reclaiming tracks by this method has been going on now for two or three years and to date we have reclaimed approximately 5 miles of single track in Hamilton, where we use 80-lb. T-rail in 30-ft. lengths, about a half mile of single track in Miamisburg and 1½ miles of double track in Dayton, where we use Lorain Section 91-375 in 60-ft. lengths. The track in Dayton has boosters under about 75 per cent of the joints. The other 25 per cent appear to be in good shape, so we did not consider it necessary to disturb them at this time.



TYPICAL APPEARANCE OF TRACK AND PAVING BEFORE RECLAIMING

TYPICAL APPEARANCE AFTER REPAIRING JOINTS AND PAVING

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The work in Hamilton, where the track and paving were in such bad shape that practically 50 per cent of the paving had to be repaired, was done at a cost of $13.88 per joint, exclusive of the cost of repaving, and $23.81 per joint including paving, or 93 cents per lineal foot of single track exclusive of paving, and $1.60 per lineal foot of single track including paving.

In making a permanent repair of this kind, we saved ourselves the expense of rebuilding, which would have meant new rails, new ties, and all the inconveniences that go with reconstruction, while this work was done without any disturbance to traffic. In fact, the continuous operation of the cars over the track helped to tamp the concrete under the booster and consequently got it seated more firmly. To date we have not had a single failure, so that this method has more than proved its worth.

The expense involved at Hamilton and the results obtained were so satisfactory that when the city commissioners of Dayton were giving serious consideration to the repaving of South Main Street, we stepped in and made our repairs the same as we did in Hamilton, and forestalled the improvement at this time as far as the railroad is concerned. This work, consisting of placing the boosters under 75 per cent of the joints, welding and building up the cupped rails, and repairing all the bad paving, whether at the joints or in between, cost us 70 cents per lineal foot of single track, and was done without any interruption to traffic.

You can readily see that we have effected a tremendous saving over the cost of new track and paving, and are thoroughly convinced that our manner of reclaiming track is the best known method today, and will give us years of additional service out of the old track.

Trot Out the Cookie Jar*

A Refreshing Discussion on Public Relations—Some Valuable Hints on Advertising Methods and Relations to Newspaper Publicity

BY LABERT ST. CLAIR
Director Advertising Section American Electric Railway Association

THE more I see of public utility managements that are successful in their public relations work, the more I am reminded of the methods by which Aunt Sally Ann Dusenberry made herself the best-liked person in my home town out in western Indiana and also got folks to do for her the things which she wanted done.

Aunt Sally Ann was a widow, capable, past forty probably, the possessor of a house that was immaculately clean, a disposition that was always congenial, and a two-gallon brown stone jar that was always full of cookies. Folks were naturally attracted to her house by its extremely clean and inviting interior and exterior, and also by the big-mouthed cookie jar. Aunt Sally Ann had more visitors and friends, I reckon, than anybody else in town. They ranged from boys in knee trousers and little girls in long skirts to the oldest inhabitant who bragged that she was so aged that she had worn out three sets of vitrified false teeth.

GOT THE WORK DONE

Aunt Sally Ann had a powerful lot of work to be done around her house and she always seemed to get it done with the minimum effort. In fact, the mothers of various boys around town wondered how Aunt Sally Ann induced their offsprings to carry in her wood, cut her grass and do other little chores so willingly when they found great difficulty in inducing the boys to do anything. The answer to this situation was that the mothers usually ordered their boys to do the job or suffer the consequences, and Sally Ann took the other way around and got the job done by arousing their self-interest in her cookie jar.

And so, as I frequently come in contact with the public utility managements of the country which are making a success of their public relations and those that are making little progress with theirs, I seem to see an analogy between their methods and those of Aunt Sally Ann and the boys' mothers.

We might consider for a moment the fact that Aunt Sally Ann always had her house in order to see if there is any analogy between this and the public utility men who are getting public cooperation. I think there is a very distinct analogy. If you will investigate the background of the managements that are enjoying pleasant relations, you will find that these men long since have put their houses in order either by explaining a way through advertising any misapprehensions that the public may have had about the cleanliness of their houses, or by sweeping out dirt where it actually existed. I do not mean by this that all companies which are not enjoying good public relations necessarily do not have clean houses, but if there be any which haven't, it might be worth while to consider sweeping up as a progressive step.

The second attractive feature about Aunt Sally Ann's public relations is, unfortunately, one that still requires much attention in the public utility field. That is, her never failing cordiality and willingness to meet people with a smile and not lecture them despite whatever personal troubles may have been on her mind. The public cares very little indeed for the personal troubles of anyone and it cares still less for the troubles of a public utility unless it can be shown that these troubles are in reality the consumers' own.

There has been much complaining through paid advertising in the public utility field in recent years. I agree that there has been justification for it. Scores of progressive executives with whom I have discussed this question, however, are very doubtful, indeed, if the manifold efforts to excite pity for public utility industries has developed favorable results.

Entirely aside from any complaining which our industries may have done in print, there is need for more cordial contact between many managements and the public. Make a survey of the public utility field and you will find that those men are getting ahead who are meeting the public in the open, who are courting their customers with a smile, in their own offices or in public meetings, and who are always available for frank conference.

Leaders in the electric railway field invariably are those who have ripped out the frosted glass between them and the public.

We now come to the last feature of Aunt Sally Ann's public relations program, which I believe, is the most important feature of all of it. That is the fact that she handed out cookies instead of orders.

The only way on earth to induce people to do things that you want them to do is to arouse their self-interest in your proposal by showing them where it will benefit them. It is true that you can get some things done by ordering folks to do them, but a friendly, co-operative spirit, a desire to come back and do more things for you, is not created in this way. *You must show them the cookie.*

THE MANAGEMENT COOKIE

The first step toward all good public relations is for the management to hold out a promise of a cookie to itself. There are many kinds of cookies to which all managements aspire. There is the increased income cookie, which, of course, is of interest to us all, but there are others. Hard-working public utility managers throughout the United States seek the cookie of satisfaction from giving good public service and from being a real power for good in building up their communities. It is vital to success.

THE EMPLOYEE'S COOKIE

Co-operation of employees is absolutely essential to good public relations. Cookies will get it. Altogether too many persons are prone to believe that the only cookie in which the employee is interested is the increased wage cookie. Of course he is interested in that, but there are many other kinds of cookies he cares for. There are thousands of capable, loyal, energetic public utility employees who are putting forth their best efforts to help

*Abstract of paper presented before Central Electric Railway Association, Indianapolis, Ind., Jan. 27, 1922.

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advance their company interests because of their pride in real accomplishment and not alone for the monetary return that their efforts bring them.

Courtesy is the biggest sales developer for a public utility company that an employee can possess, and untold numbers of them are courteous not because to be courteous means a few more dollars in their pay envelopes but because it is a distinct pleasure to them to treat people cordially and politely. A few signs around public utility offices, in street cars, and in other places where the public comes in contact with employees saying that the employees are picked because they are courteous fills the employees with pride in their work, which is a cookie much to be desired.

Again, the substitution of names of employees for numbers, as in the case of conductors and motormen, or the placing of name plates on the desks of employees gives them a feeling that they have ceased to be mere cogs in the great public utility machine. They have become men and women charged with the responsibilities of sufficient importance to make them meet the general public on the same ground as do good salesmen and bring their individuality into play. And who will say that feeling is not a cookie?

The Newspaper Cookie

The importance of enlisting newspaper support in every community cannot be minimized and here again cookies can be used to advantage. I know that it is the custom for persons who have not made a careful study of the real workings of newspapers and their proprietors to say that you can buy the support of any newspaper in the land if you approach it with an advertising contract cookie of sufficient size. I do not believe for one minute that this is true. Of course, all newspapers are interested in advertising contract cookies, and they are not to be blamed for that. They thrive on advertising and it is proper that they should sell it and it is entirely proper that the men who use their space should pay them for it.

But the advertising department of a newspaper is only one department.

There is the news section which is just as anxious for its news cookie as the advertising section is for its advertising cookie. The editorial staff of a newspaper has only a passing interest in the advertising department, regarding it as a sort of a necessary evil whose duty is to fill up blank space in the paper not required for news. The cookie that the editoral staff desires all the time is news. There is news on every public utility property in this country and if properly presented to the news section of a newspaper it will be seized eagerly and devoured.

At the same time it is a great mistake to attempt to present the news section with a dog biscuit in the shape of advertising that should go into the display columns and attempt to tell the editor that you have a nice wholesome cookie for him. This cannot be done very many times, and the advertising man or publicity man who continues to try it is not going to last long in his chosen field. It is a mistake for any publicity man to attempt to convince public utility operators that he can get printed free of charge material that has no news value but should go into the advertising columns. It is a greater mistake for a public utility manager to urge his advertising representative to attempt to get advertising without news value into the columns. The most that the publicity man can do is lose his job, but the public utility manager who gets in bad with the newspaper also can lose their support.

Newspapers everywhere want to do the thing for their towns that will build them up, because as their towns grow so they too will grow. Hence, the job of the public utilities is to show the newspapers that their cookie of future business lies in aiding the public utility to help build up the town.

The Car Rider's Cookie

The car rider's cookie is good service. It is not necessary for me to dwell long on what this should be. This has been covered thoroughly at almost every public utility meeting I have attended in several years. But the selling of service to the public utility patron has not been done intensively enough from the cookie angle. Far too much money has been spent telling the public that it should support its public utilities in order that they may thrive and pay dividends. The consumer has very little interest in dividends except as the cutting off of them might curtail his service. But he does have a very vital interest in the service cookie that brings him rides. This is the cookie that must be held up to him.

The Business Man's Cookie

The cookie that attracts business men is maintaining or increasing business. Except in a few cases, such as Des Moines, where electric railway service have stopped completely and the business man's income has dwindled, the real effect that electric railway service has on his cookie has not been brought home to him.

The merchants of Des Moines did not realize that upon the continuance of street railway service depended their cookie. So they stood by and permitted street railway service to die. But when, within a day or two, they saw their business cookie snatched away from them, they screamed to high heaven for the return of the cars and they never ceased screaming until they got them back. The mothers of Des Moines did not realize that their greatest cookie of all—the safety of their children in going to and from school—was dependent very largely on street car service until street cars stopped. When this happened they organized and worked until their cookie was returned to them.

And so it goes right down the line with every class of persons that is affected by public utilities and that means all classes.

How Motor Transport Influences Interurban Operation*

By M. Ackerman
General Manager Cincinnati & Dayton Traction Company, Dayton, Ohio

MOTOR truck competition has become one of the most vital questions in the operation of interurban freight service; more particularly so since the advent of improved highways. These afford motor truck companies or individuals excellent facilities, for which they are not assessed, but for which the interurban companies are assessed.

The laws in the State of Ohio provide, particularly in the counties through which we operate, that the benefits from the improvement of public highways be assessed against all properties 1 mile on each side of them, thus giving our truck competitors a decided advantage.

It also seems unjust that the motor truck companies be permitted to utilize the highways from town to town without being obliged to file schedules of time and rates. They can thus scalp such interurban rates as are on file, arrange schedules from time to time to suit their own convenience, and can operate without any obligation, except for such moral obligation as they owe shippers.

To cope with this situation, we arranged with our largest competitor to act for us as pick-up and delivery agents in all of the principal communities on our property. This arrangement took effect May 1, 1921, and since that time sixty-four 5-ton Packard trucks have been picking up and delivering to us shipments they originally moved in competition.

Because of this pick-up and delivery the truck company provides a more frequent service than it could have under the former long haul plan. Thus it has the advantage over other motor truck competitors whose equipment is tied up in the long haul movements.

The motor truck company's advertising and solicitation brings in business, which we otherwise would not have got.

In the operation of this service our local class rates are added to the pick-up and delivery charges, making through rates slightly lower than the motor truck company's rates to the same points. But the truck company, which under competitive operation had lost money, is now enjoying a profitable business.

It is our firm belief that by the co-operation outlined above, and through the aid of proper legislation, we can reduce motor truck competition to a minimum.

All freight handled by the pick-up and delivery company is checked and loaded direct into our cars at points along our line, thereby eliminating extra handling.

*Abstract of discussion on "Reclaiming Track in Paved Streets" before Annual Convention, Central Electric Railway Association, Jan. 26-27, 1922, at Indianapolis.

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Shipments are handled from our cars to the trucks of the pick-up and delivery company which enables a consignee to receive his goods shortly after the arrival of our freight trains. The old method, of unloading into freight house, necessitated the rehandling and rechecking to the consignee's delivery.

In connection with the foregoing arrangement we have also established what we term a delivery service. For example, the trucks of the National Cash Register Company deliver the finished product to our cars at Dayton, and our pick-up and delivery company takes this material from our cars at destination and delivers it direct to the consignee.

On the other hand, a shipment of castings from Cincinnati, which is picked up by the truck company and loaded directly into cars, is called for at our Dayton station by the National Cash Register Company's trucks, thereby handling the shipment at only a slight additional charge over our class rates. This we term our pick-up service.

The inauguration of this service has had the effect of reducing our claims to a minimum. Claims for concealed damage are settled on a 50 per cent basis. On all other claims, the company responsible settles for the damages. We have experienced no difficulty in settling on this basis with the truck company.

Accounting Is Simple

All shipments are billed out in the same way as other shipments delivered to the freight station. An extra abstract is prepared, one copy going to the auditor of the railroad, one copy to the pick-up and delivery company, and one copy remaining in the station agent's file.

Statements prepared by our agents for our proportion are supported by a copy of the abstract, and sent to the pick-up and delivery company semi-monthly. Payments are made direct to the agents rendering these statements.

Because of the above arrangement our 1921 freight business decreased only 11¾ per cent as compared with 1920, which was our banner year. Our passenger business, however, fell off 16½ per cent for the same period.

In places too small for the pick-up and delivery company to operate profitably, local express men pick-up from and deliver to shippers. This takes care of freight formerly picked up by our truck competitors. The local arrangement, which is on the basis of a flat rate, has drawn considerable business, both local and interline.

If we are to develop our freight business in the face of strong motor truck competition, which is not confined to direct routes, we must utilize the same motor trucks to bring the business to our stations.

Early in 1920 we were operating between Dayton and Cincinnati, Ohio, three freight motors with a motorman, conductor and freight helper on each, making three deliveries at all points each day. The three freight motor crews were in service from twelve to fifteen hours each day, making it, of course, an expensive operation.

Later in 1920 as the business depression commenced and because of motor truck competition, it was necessary to curtail expenses, particularly in the handling of freight. We reduced our daily freight service to two crews and two deliveries at all points. This was not sufficient to put our freight business on a profitable basis, and early in 1921, in order further to curtail expenses we tried out the following schedule:

At our freight station in Dayton we have a motor and three trail cars; all freight for West Carrollton, Miamisburg and Franklin is carried in the motor; freight for Middletown is loaded into one trailer; freight for Hamilton into the second trailer; and freight for Cincinnati into the third trailer.

Shipments are received up to 2:45 p.m. at Dayton. The motor leaves at 3 p.m. with three trail cars or more, arriving at Cincinnati at 7 p.m. Local shipments are unloaded and loaded for points south, and the trail cars set in at Middletown and Hamilton.

The freight motor and trailer are then left at Cincinnati, for freight delivery and loading the following day. After having stood there all day they leave at 7 p.m. for Hamilton, unloading local shipments at the freight house and picking up one or more trailers loaded for Dayton. At Middletown a trailer loaded for Dayton is picked up in the same way.

The north-bound freight picks up all loaded trailers for Dayton, arriving there about 12 o'clock midnight. This service gives shippers one delivery each day, available at every point along our line at the opening of the freight station the following morning.

Thus with one crew we handle as much freight as we could before with three freight crews and motors. The new scheme requires only ten hours' labor, however, as against a total of forty hours under the old arrangement.

American Association News

Notes on the Midyear Conference and Dinner at Indianapolis

IN A LETTER just sent out from association headquarters, Executive Secretary J. W. Welsh makes the following announcements:

Reduced rate transportation by the "Certificate Plan" has been requested from the Railroad Passenger Associations. All those who go to Indianapolis are requested to ask for certificates when purchasing railroad tickets, for the benefit of others, whether they expect to use the reduced rate privilege on the return trip or not. It is necessary that 350 should be secured in order to obtain half rates on the return trip.

A special dinner for ladies attending the Midyear Meeting has been arranged. The same entertainment and dinner will be furnished in a separate room and the price will be $5 per cover. Reservations for this dinner should be forwarded as promptly as possible to association headquarters or to Harry Reid, president of the Interstate Public Service Company, 510 Board of Trade Building, Indianapolis, Indiana, who is chairman of the dinner committee.

Comprehensive Membership Campaign Planned

A MEETING of the American Association committee on company and associate membership was held at the William Penn Hotel, Pittsburgh, Pa., on Jan. 25. The members in attendance included F. R. Coates, Toledo, Ohio, chairman; L. E. Gould, Chicago, Ill.; P. N. Jones, Pittsburgh; H. H. Norris, New York; K. A. Simmon, Pittsburgh (representing M. B. Lambert); E. M. Walker, Terre Haute, Ind.; E. P. Waller, Schenectady, N. Y., and E. F. Wickwire, Mansfield, Ohio. There were also present Executive Secretary J. W. Welsh and, by invitation, F. J. O'Brien, Chicago, and R. W. Williams, Pittsburgh.

Mr. Welsh summarized the membership situation with regard to recent changes, and agreed to prepare a list of members in arrears for dues with a view to having them seen by members of the committee, if possible, before their names are removed from the rolls.

In regard to securing new members it was agreed that a list of "prospects" should be prepared and divided among the members of the committee for follow-up. Assignments are to be made on a geographical basis, as follows: W. R. Alberger—Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington; F. G. Buffe and Rolla Wells—Colorado, Kansas, Missouri, Nebraska, Texas; F. R. Coates—Alabama, Florida, Georgia, Louisiana, Mississippi; L. E. Gould—Illinois, Iowa, Minnesota, North and South Dakota; J. H. Hanna—Delaware, District of Columbia, Maryland, Virginia; P. N. Jones and M. B. Lambert—New Jersey, Pennsylvania, West Virginia; H. H. Norris—Connecticut, Maine, New Hampshire, Rhode Island, Vermont; W. S. Rodger—Michigan; E. M. Walker—Arkansas, Indiana, Kentucky, Tennessee (with L. E. Gould), Wisconsin; E. P. Waller—Massachusetts, New York; E. F. Wickwire—Montana, North and South Carolina, Ohio, Oklahoma, Wyoming.

It is understood that a sub-committee will prepare material for use by the main committee, including a list of advantages of membership with possible later elaboration to form a booklet on this subject. The committee adjourned to meet at Indianapolis, at 2 p.m., Feb. 27.

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Recent Happenings in Great Britain

Fares, Wages and Prices All Being Readjusted—£648,000 for Edinburgh Electrification

(FROM OUR REGULAR CORRESPONDENT)

OWING to depression in trade, high wages, high cost of materials, and so forth, the past tramway year in Great Britain has been indeed a dull one. In some respects, however, the corner has been turned. While there is not yet much sign of improved trade, wages and prices have begun to come down. The index figure of the cost of living is steadily falling. Threats of strikes by tramway employees have been met by means of the sliding scale and the only matter still in dispute is the guaranteed forty-eight-hour week.

Fares Reduced from High Levels of War

A few tramway undertakings have already begun to reduce fares from the high levels reached since the end of the war. This is being done in the hope that increased patronage will counterbalance the reduced fares. A few schemes for extensions of track are in prospect, the hope of the promoters being that before the contracts are let prices will have further fallen. No new steam railway electrification work has been put in hand during the year, but a reduction in cost and a possible government guarantee of interest on the new capital may help things forward soon.

Electricity District Proposed to Be Created

The railways owning the main lines running out of London are interested in the proposals of the electricity commissioners to constitute a London & Home Counties Electricity District to be administered and controlled by a joint electricity authority. The scheme has yet to be finally adjusted and confirmed, but the aim here as elsewhere (under the provisions of Electricity Supply Act) is to co-ordinate, consolidate and develop the supply of electricity for all purposes, and to erect great generating stations which will supersede many smaller ones.

The County of London Electric Supply Company has now been authorized to build a station of 100,000 kw. capacity at Barking, and it seems that the railways will not be encouraged to build power stations of their own when they go in for electrification, but to take the energy from a supply company or authority. The railways naturally want to be assured that they will get the power as cheaply as if they produced it themselves. They are to have only one representative on the joint Electricity Authority, which is to consist of twenty-seven members.

The London County Council has approved a report by its highways committee on the question whether a by-law to make it an offence for any vehicle to pass a tramcar on its near side where passengers are entering or alighting would have the effect of reducing the number of street accidents. The committee considered that there would be little doubt that the driving of vehicles between a stationary tramcar and the curb is a source of many accidents and it had for some time attempted to find a remedy.

In April last the Minister of Transport, when approached by the committee stated that it was doubtful whether he possessed the power to sanction such a regulation, and in any case it was unlikely to be considered desirable to do so. In October, a deputation from the Municipal Tramways Association was informed by the Ministry that the matter would be further considered. The highways committee now proposed that the attention of the ministry should be called to the serious increase in the number of accidents at fixed stopping places caused by overtaking traffic and that the ministry should be asked what steps it was proposed to take to safeguard the public.

Wide Powers Enjoyed by Glasgow Corporation

In this connection it is desirable to point out that the Corporation of Glasgow has for some years possessed the power in question, but that many other towns have sought it without success. For some reason or other the municipality of Glasgow succeeded in obtaining powers which are denied to other local authorities. For example, a good many years ago—about the time when electric traction was being generally adopted for Glasgow tramways—the Corporation managed to get an Act passed by Parliament to enable it to fix "rosettes" to the walls of buildings for supporting the span wires whether or not the owners of the agreed. In other towns this substitution of rosettes for big steel poles at the curbs of the footpaths can only be carried out if the owner of the building consents.

In regard to the present case, it appears that under a private Act of Parliament passed some nine or ten years ago, the Glasgow Corporation obtained wide powers to make by-laws. These covered the regulation of street traffic, and one which was put forward provides that when a tramcar is standing at a stopping place every driver of an overtaking vehicle who intends to pass on the near side shall draw up until the roadway is clear of passengers entering or leaving the car. This by-law was in 1915 presented to the Sheriff of Lanarkshire (the local law authority) and he sanctioned it, and soon afterwards it was confirmed by the Secretary for Scotland (who is a member of Government) and thus it became law.

During recent time several English municipalities owning tramways have tried to get Parliamentary powers to the same effect but they were unsuccessful. The Ministry of Transport has set its face against such a regulation as obstructive of general street traffic, and English municipalities evidently have not the general power possessed by Glasgow to enforce such a regulation themselves. On the general question, it may be said that in most if not all towns outside of London, such a regulation might be worked without undue street blocks of traffic and would undoubtedly conduce to the safety of tramway passengers. In London, however, the volume of general vehicular traffic on the main thoroughfares occupied by tramways is so great and the tramcars are so frequent, it seems probable that such a regulation would involve at the stopping places at busy centers a more or less perpetual blockade of general wheeled traffic.

£648,000 for Electrification in Edinburgh

R. S. Pilcher, general manager of Edinburgh Corporation Tramways, has prepared a statement showing the proposed order in which the present cable tramway routes should be electrified. He divides the system into eleven sections and gives successive dates ranging from May, 1922, to September, 1923, at which the work should begin on the several sections. In view of the fact that prices are falling, it is expected that the whole work will cost less than the estimate, £648,000, which is based on present prices. In the end of December the Town Council finally decided to proceed with the electrification on the overhead system.

Abandonments Threatened in English Cities

The local tramway at Taunton some time ago ceased to run the cars because of a dispute with the Town Council over the charge for power. The Council urged the necessity of restoring service on the ground that the present omnibus service was inadequate and unsatisfactory. The Mayor stated that before the cars could be run again, another Provisional Order (the equivalent of an Act of Parliament) would have to be obtained and that it would take at least twelve months to do this.

In Scarborough a threatened cessation of tramway services has been avoided. The Scarborough Tramway decided to stop working at the end of 1921. The traffic is largely seasonal and the tramway, which was placed in service in 1904, has never paid a dividend. An offer from a group of engineers to purchase the undertaking ended the difficulties, however. It is stated that the new company will run omnibuses in conjunction with the tramways.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Des Moines Injunction Unwarranted

State Supreme Court So Holds in Franchise Case, But Orders Trial of Issue on Merits

The Iowa Supreme Court has overruled the decision of Judge James C. Hume in the District Court of Polk County, who granted a temporary injunction restraining the holding of the recent franchise election in Des Moines, Iowa. The members of the Supreme Bench held unanimously that the trial judge in the lower court erred in granting the injunction.

Both sides in the case are claiming a victory in the ruling. The attorneys for the city and for the company feel that the ruling will go a long way in killing the action of the North Des Moines Improvement League when the case is tried on its merits in the lower court. On the other hand, Former Corporation Counsel Byers, who fought the case for the Improvement League, contends that the ruling was only with regard to the holding of the election and that the merits of the case remain to be decided.

The decision of the State Supreme Court was written by Judge Evans. He said:

> Though the ultimate merits have not been ignored by the respective counsel in their arguments here there is no suggestion that such merits be settled by decision at this time.
>
> In view of the narrow scope of the question as presented we prefer neither to intimate nor to form any opinion as to final merits of the case. The order granting the temporary writ took the form of a decree and was based upon an expressed finding sustaining the grounds of balance to the validity of the proceedings. Such a finding purported to adjudicate to that extent the final merits of the main case before it had been tried or put at issue.
>
> The function of an injunction is not to throw a monkey wrench into the moving machinery of either party except for the purpose of preserving in pending litigation some right which otherwise would be irreparably lost.

The franchise election was held on Nov. 28. On the Saturday preceding, Judge James C. Hume of the District Court, acting upon an injunction proceeding brought by Grant Van Horn of the North Des Moines Improvement League enjoined the holding of the election. The case was put before the Supreme Court informally on Sunday and an order dated Monday was issued by the higher court suspending the operation of the injunction in so far as the holding of the election was concerned. It is thought that the case will not be heard in district court before the latter part of February at the earliest.

A day previous to the overruling of Judge Hume's injunction the Des Moines City Railway filed its formal notice of acceptance of the franchise with the city and posted the $10,000 bond required by the franchise.

There is a general feeling among the citizens of Des Moines that the franchise election is settled and the public seems to be more than satisfied with the quality of service now being furnished by the Des Moines City Railway.

Lively Detroit United Meeting Anticipated

Although threatened with a mandamus action to force action in carrying out the provisions of the ouster ordinance to compel the Detroit United Railway to remove its tracks from Fort Street and Woodward Avenue in Detroit, Mayor Couzens stated that he is not ready to require the company to take its cars off the streets where franchises have expired. He would appear to be holding the ordinance over the head of the company for possible use as a club to force the company to come to terms which more nearly represent the ideas of the city than any so far proposed. Mr. Couzens has purchased one share of the capital stock of the Detroit United Railway and expects to sit as a stockholder at the annual meeting of the company on Feb. 7.

The Mayor's interest in the coming meeting was increased by the announcement by A. Avila Gingras, Montreal broker, that he controlled by proxy a majority of the stock.

The meeting will be an important one since the company must at that time decide whether it will sell its system to the city at a price agreeable to the city officials or tear up its tracks from Fort Street and Woodward Avenue. The city's offer of $388,000 for these tracks, which it is understood still stands, was rejected some time ago by the company. Although the ouster ordinance was passed by a majority in excess of 60 per cent of the voters, no definite steps have been taken by the city to enforce its provisions.

Reports now in circulation are to the effect that efforts are being made to bring about an agreement among all the various factions involved prior to the annual meeting.

In announcing his intentions to bring a mandamus action to compel the Mayor to enforce the ouster ordinance, a local attorney charges that the terms of the ordinance have been evaded and that the fact that the Mayor proposed the ordinance was responsible for his re-election. Other city officials who are charged with responsibility for not enforcing the ordinance are the Corporation Counsel and members of the City Council. The writ, issued by Judge Harry J. Dingeman, orders the city to show cause why the ouster ordinance should not be enforced at once. It is made returnable on Feb. 11.

New Franchise Ready to Be Presented to Dubuque Council

The franchise ordinances over which the officers of the Dubuque (Ia.) Electric Company and the city commissioners have been counseling intermittently for the past several months is understood to be ready to be presented to the Council.

When the franchise renewals for operating street cars and the light and power utility were presented originally last fall, the Council and corporation representatives were unable to agree on some points. The original drafts have been considerably altered, it is said, in the various conferences which have been held.

A special election to secure a vote of the people on the proposed franchises was contemplated when the measures were drawn several months ago. However, this procedure hardly will be followed now, according to O. E. Carr, city manager. The regular municipal election is less than two months away, and the franchises, if approved by the commissioners, probably will be submitted to the voters at that time.

Wage Agreement Renewed, Slightly Modified

A new wage agreement has gone into effect on the United Railways, St. Louis, Mo., Rolla Wells, Receiver, affecting about 5,000 employees, members of the Amalgamated, retroactive to Jan. 1. Motormen and conductors retain the old scale of 50 cents an hour for the first year, 55 for the second, 60 cents for the third, and 65 cents an hour after the third year. Time and a quarter for overtime also remains in effect.

The new contract runs until July 1, and thereafter it may be terminated by either side on thirty days' notice. This arrangement is made by the management in view of the probability of getting a decision from the Missouri Public Service Commission in the valuation case now pending. The present 7-cent fare is to continue in effect until June 30.

The union representatives made a fight for a return to old working conditions under which men on trailer runs were allowed a minimum of eight hours. Under the new agreement the minimum is six hours. The union representatives also contended for time and a half overtime but this was not allowed.

Although the union has ratified the agreement in principle, all of the details have not been worked out and the formal signing of the contract may not take place for several days.

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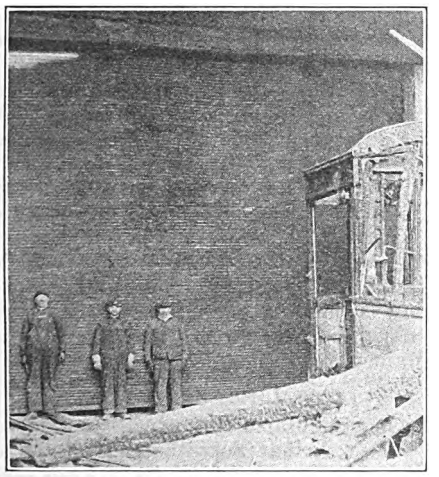
$1,000,000 Fire Damage

Ninety Cars Were Lost by the Chicago Surface Lines in Devon Carhouse on Jan. 26

Fire destroyed half of the Devon Avenue carhouse and seventy-eight passenger cars belonging to the Chicago Surface Lines on Jan. 26. Besides twelve miscellaneous service cars were lost. The intervention of steel rolling shutters between two sections of the carhouse saved ninety other cars and the portion of the building devoted to station headquarters. The loss was



STEEL SHUTTERS WHICH PREVENTED SPREAD OF THE FIRE

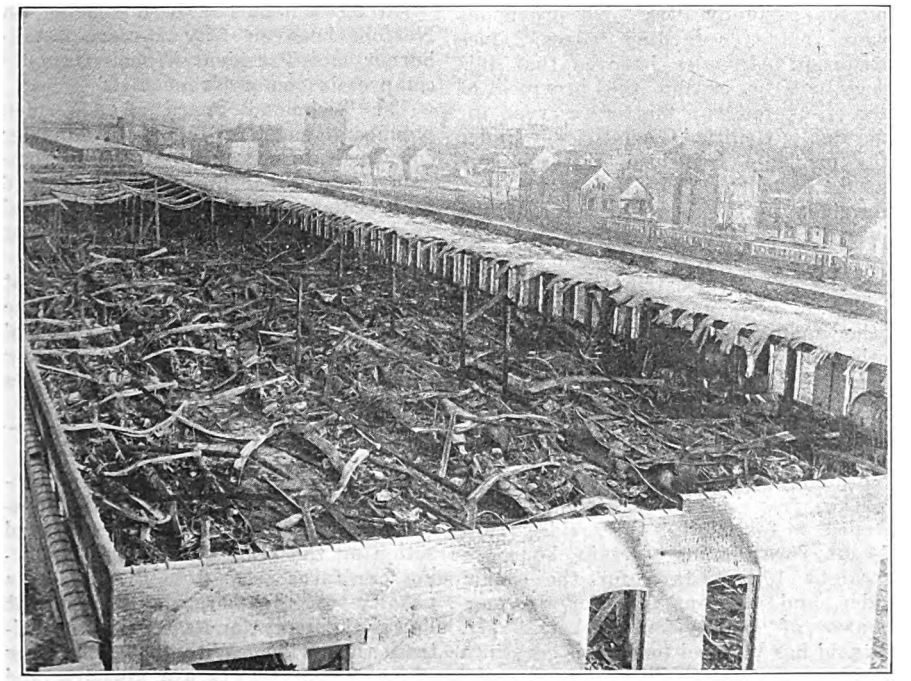
about $1,000,000. The building and its contents were covered by insurance.

The blaze was discovered about 3 o'clock in the morning and within a short time the structure, which was about twenty years old, was a mass of flames. The building was rectangular in construction, about 100 by 1,000 ft., with the principal exit at one end. It was feared that a total loss would result, but the employees succeeded in lowering the rolling doors. This confined the flames to the rear half of the structure. All cars in the rear section were destroyed. The heat was so intense that the metal doors became white hot and some cars on the side of the doors opposite to the fire were scorched by the intense heat of the burning section.

Most of the cars that were destroyed were comparatively new. Some of them, however, were built as long ago as 1908, but some had been constructed as recently as six months ago. The latter included nine of the new trailers. Fourteen re-built motor cars converted to haul trailers were also lost. The miscellaneous equipment destroyed included four sprinklers, three sweepers and two snow plows. The Surface Lines own about 3,200 passenger cars, scattered among sixteen stations. Prompt work on the part of the officials resulted in gathering sufficient of the surplus equipment to the Devon Avenue station so that full service was given in the morning rush hours on the lines affected.

FLAMES CONFINED TO INTERIOR

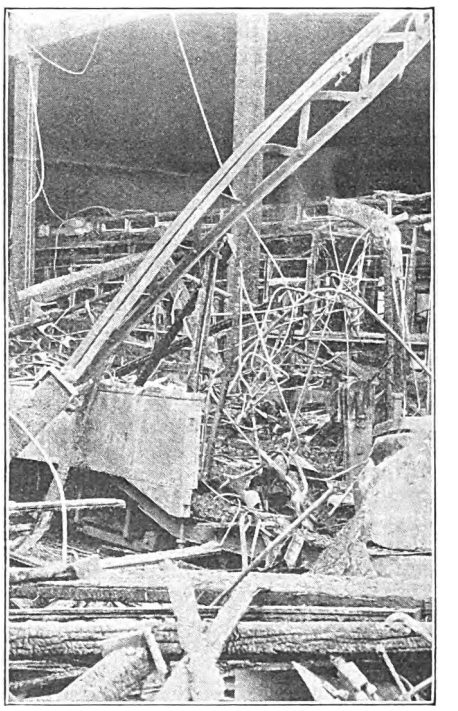
The roof of the carhouse was of mill-proof, slow burning construction supported by steel girders. This confined the flames to the interior and they spread rapidly from car to car. The electric current was cut off shortly after the fire started. This put out the lights and made it difficult to move the cars, but automobile trucks were secured and a number of cars were taken out the front half of the building before the flames were checked. The debris was cleared away after a few days and it was announced that the burned portion of the carhouse would be used at least temporarily for open storage of cars.



LOOKING SOUTHEAST, SHOWING PART DESTROYED AND REMAINING PORTION OF CARHOUSE AFTER CHICAGO FIRE

Jitneys Defeated in Kenosha

At a referendum election held on Jan. 24 at Kenosha, Wis., the proposition to permit jitneys to operate on the streets of the city was voted down 4,256 to 2,415. Out of nine city wards,



ROOF GIRDER RESTING AGAINST CAR

the jitneys carried only one. At the same time Kenosha adopted the city manager form of government by a majority of 872.

The street railway service in Kenosha is being operated by the Wisconsin Gas & Electric Company, a subsidiary of the North American Company. When this company learned that the jitney proposition was to be put to a referendum vote, it at once petitioned the Wisconsin Railroad Commission for permission to abandon railway service in Kenosha should the referendum go in favor of the jitneys.

Some years ago when the jitneys were allowed to operate in Kenosha without any restriction or supervision, the company suspended railway service for forty-five days, with the result that an ordinance was passed regulating jitney operation. Since that time one-man equipment has been introduced in Kenosha. The cash fare there is 7 cents and the ticket fare eight for 50 cents, but an unlimited ride weekly pass is sold for $1.

Shortly before the referendum the company proceeded to inform the public of its attitude on the question, pointing out conditions under which the railway is now being operated and the consequences of permitting unrestricted jitney operation. Newspaper advertising space was freely used by both sides in the campaign.

Kenosha is a city of 40,000 population located about 30 miles from Milwaukee. It is between that city and Chicago.

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Governor Miller Favors 5-Cent Fare

Tells Merchants He Thinks It Practicible for New York—Appointed Present Commission

The 5-cent fare in New York will be preserved, in the judgment of Goveror Miller. This statement was made at an address on Jan. 26 to the Merchants' Association. The Governor took occasion also to explain the reasons which led him to appoint the present Transit Commission, and he invited the co-operation of the city government in the work of the commission.

The Governor said he had no word of criticism for the city administration in taking the Transit Commission act to the Court of Appeals in order to test its legality and based his appeal for a cessation of the fight upon the recent decision of that tribunal upholding its constitutionality. He explained he had favored the Transit Commission law because, upon assuming office, he found that the public was getting less service than for years and the problem had become "the football of politics." Continuing, the Governor said, in part:

If nothing was done I foresaw a situation in this town five years hence, we will say, which to me was appalling, because you know there is a daily increase in travel on the transit lines of this center of 4,000—4,000 more people will ride to-day than did yesterday and 4,000 more will ride to-morrow than did to-day.

Now stop and think what that means—no provision whatever to take care of it. I found it was essential to break the deadlock if we were to get any progress, which for years had existed between the Board of Estimate and the State officials, and, mind you, those officials were all of the same political party.

It was necessary, in my judgment, that the solution of the problem should be vested in a board which possessed the regulatory powers of the State, which have never been delegated to the city. There has been a great deal of talk about the power to modify city contracts. They needed modification in the respect that the companies had advantages under those contracts which they needed to surrender in the public interest. No modification was contemplated requiring the city to give up anything. There was nothing new in anything that was done or in the exercise of any legislative powers that were exercised. Some of the people of this community seem to have forgotten that these very contracts were made in the name of the city by a State body—the Public Service Commission.

Now I take it that the bogey or the 5-cent fare has served its purpose. We still have with us the myth of the 5-cent fare. I say myth, because anybody who rides about this town knows that instead of a 5-cent fare the people are required to pay 7 and 12 and 15 and 17 and even 20 cents for wholly inadequate service. And what you were doing here by clinging to this myth of the 5-cent fare was to make it more likely every month that you would'nt be able to ride at all. What this town needs first of all is service.

And I want to say to you also, in my judgment, the 5-cent fare can be preserved. In my judgment it will be preserved. It will be preserved by establishing a just rule to govern the problem, not on any theory you can get something for nothing—not on the theory that the people will be carried for less than it costs to carry them, including a proper return on the honest capital—and I emphasize "honest"—that is used in their service. You can never extend your transit facilities unless you recognize that principle. If you apply it honestly and impartially all the evidence indicates you can get adequate extensions of transit facilities, and by the elimination of unnecessary waste and cost you can preserve, in all probability, the 5-cent fare.

The City of New York is confronted with a situation that its borrowing capacity is now frozen in from $250,000,000 to $300,000,000 of subway bonds, the interest on which and the amortization of which are now being provided by the taxpayers of the city. Unless that frozen credit can be released, the city of New York has not sufficient borrowing capacity to secure needed extensions of your transit facilities or to undertake the vast other public works that are now crying for further expenditure of money. Now, that is the problem. It is in the hands of three gentlemen whom I selected, residents of this community, and I thank God that I was able to find three such public-spirited citizens who were willing to devote their time and talents to the service of this community.

Two of them happen to be Democrats and one a Republican. That was merely a coincidence, because I selected these gentlemen wholly regardless of their politics. I looked for the men whom I thought best fitted to solve this problem and I think that every day that goes by the people of this community are learning more and more that a wise selection was made.

Franchise Proposals Popular in Fox River Valley

Franchise proposals are the thing in Aurora and Elgin, Ill., and in other cities in the Fox River valley served by the Aurora, Elgin & Chicago Railroad, and the Elgin & Belvidere Electric Railway. Following the franchise framed by the Elgin City Council, which was discussed in the ELECTRIC RAILWAY JOURNAL for Jan. 14, page 87, B. P. Alschuler, counsel for Joseph K. Choate, receiver for the Aurora, Elgin & Chicago line, presented to Judge Evan A. Evans of the United States District Court, franchises for cities which the line serves. He has prepared one for Aurora, one for Elgin, and one for the other cities in the Fox River Valley which the line taps. Within a few days, Bion J. Arnold, president of the Elgin & Belvidere Electric Railway, submitted a franchise to Mayor Arwin E. Price for consideration by the commissioners.

The first franchise, that of the Aurora, Elgin & Chicago company, provided that the traction company would be liable for no costs of paving, although it will repair streets injured by the company cars. No provisions were made regarding fares, since Attorney Alschuler believes that this does not lie within the province of the cities, but is a matter reserved for the Public Utilities Commission. Under the proposed franchise, the company would have the right to operate over its lines in the city the cars of the interurban companies which feed the city. It would also have the right to use overhead distribution storage battery, and gasoline, kerosene or other materials for motive power. In other respects the franchises correspond to the previous ones in effect.

The franchises are asked in the name of the Aurora, Elgin & Chicago Rail-Electric Company, the name of the reorganized Fox Valley lines.

The franchise presented by Mr. Arnold is for Elgin. It provides for a 5-cent fare during certain hours, a straight 10-cent fare for the casual rider, and a 7-cent fare for the purchaser of twenty-four tickets. Mr. Arnold has planned to run his cars into Elgin over the tracks of the Aurora, Elgin & Chicago Railroad if arrangements can be made.

Storm Worse Than Strike

Unprecedented Snow Fall at Richmond Hampers Company Seeking to Restore Service After Strike

Interest in the railway strike in Richmond, Va., has been almost completely overshadowed by the unprecedented snow storm of Jan. 27 and 28. All traffic was suspended until late Sunday afternoon and on Feb. 1 the streets were still piled high with snow. Steam shovels of the department of public works cleared some of the principal business streets, but all forms of travel to the suburbs are still much handicapped.

With less than half its normal force of motormen and conductors, the Virginia Railway & Power Company, which had been tied up in Richmond and on its interurban line by a strike, began on the afternoon of Jan. 28 to dig out its main lines. Forces of motormen and conductors in uniform—men hired since the strike began, worked in gangs picking ice from the tracks where vehicle traffic had packed it tight, and by Monday morning a partial service was resumed on the Broad Street and the Main Street lines.

ALL LINES SOON OPEN

General Manager Harvell announced on Feb. 1 that notwithstanding strike and weather conditions, there were seventy-one cars in operation, the average number in normal times exclusive of rush hours being ninety-eight. Five lines remain without service. It may be the end of the week before all of these can be opened as extensive snow drifts are still to be cut in some places. As fast as additional men can be obtained the service will be increased during the rush hours on the principal lines now in operation. Full service has been resumed on the interurban line and in Petersburg.

An agreement has been reached in Norfolk between City Manager Ashburner and President Wheelwright to compromise on a 6-cent fare.

The Richmond Board of Aldermen planned to meet on Feb. 1 to consider concurrence in the action of the Common Council reducing the fare from 6 to 5 cents in Richmond, as a reprisal against the company for its wage cut and refusal to arbitrate.

The company takes the ground that the strike is over, and that but for the storm all lines would now be in normal operation. Experienced men are being employed, and the patronage of the cars now in operation is increasing.

COMPROMISE AGREEMENT EFFECTED

Pending negotiations for a compromise of the strike the Board of Aldermen on the night of Feb. 1 deferred action on the reprisal ordinance reducing car fares from 6 to 5 cents as a penalty to the Virginia Railway & Power Company for its refusal to arbitrate the strike. With the rapid thaw of snow the streets are clearing and service is being restored by the company on nearly all lines.

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A conference was set to be held on Feb. 2 to be attended by three representatives of the strikers, three from the company and three from the Board of Aldermen.

NEW WAGE SCALE FIXED

The company has agreed to take back as many men as it needs to fill vacancies, at the rate pay to be 35, 37½ and 40 cents an hour according to seniority, with 5 cents an hour extra for one-man car operation. This is practically the scale against which the men struck and at which the company has since been employing men, the concession being that those who come back at once may retain their seniority and come back as old men and not have to be re-employed as new men at 30 cents an hour. The company has been hiring men of previous experience on other roads on the basis of one year experience. If the negotiations looking toward a settlement of the strike are successful the city is to regulate jitneys, take prompt action on a request for a trolley bus franchise and continue the 6-cent fare for the present.

An agreement has been reached in Norfolk to reduce fares from 7 to 6 cents. The wage arbitration in Norfolk has resulted in a report for a scale of 35 cents an hour for first-year men, 39 cents for second-year men and 42½ cents for third-year men. Service in Norfolk is declared to be normal.

Wireless Comes to Rescue

After all forms of its wire communication had failed the Monongahela Power & Railway Company, Fairmont, W. Va., resorted to wireless to operate its cars and give instructions to its repair crew to mend its breaks occasioned by a recent blizzard. Edward C. Jones, Jr., who, with a couple of companions, operates a wireless set at Fairmont, went to the rescue of the traction officials. He was able to pick up Clarksburg, and immediately upon receipt of this information Capt. L. W. LaMar, manager of the power department of the company, established headquarters in the wireless office and dictated instructions to his superintendents in Clarksburg.

Through the agency of the wireless it was possible for the company to get a 20,000-volt, high-tension feeder working from the Rivesville plant into Parkersburg, supplying sufficient power to bring in the stranded interurban trains caught out on the Clarksburg line when the 66,000-volt feeder went out of commission.

Three-Cent Wage Reduction in Dayton

Wage reductions have been ordered by the Dayton (Ohio) Street Railway which will affect about forty employees. The new scale will be 41, 43, and 45 cents an hour. The old scale was 44, 46, and 47 cents an hour. The People's Railway had previously reduced its wages.

Taxpayers' Suit Heard

Court Takes Under Advisement Plea to Prevent City Dipping Into General Fund to Help Railway

In Superior Court before Judge J. T. Ronald, the "Fourteen Taxpayers" suit, in which taxpayers of Seattle, Wash., are seeking to enjoin the city of Seattle from using general tax funds for the support of the Municipal Railway was recently tried. Judge Ronald took the matter under advisement.

In the opening testimony, attorneys for the taxpayers outlined past fiscal policies of the corporate authorities with respect to the Municipal Street railway, which indicate danger of invasion of the general tax fund to pay for the maintenance and operation of the traction system in the future. Specific instances were quoted.

The position taken by the fourteen taxpayers in seeking a permanent injunction against the invasion of the general fund for the railway was briefly outlined by counsel for the plaintiffs. In presenting the case counsel said:

> We expect to prove that at the time of the bringing of this action last February the city had taken $83,000 from the general fund for the railway. We contend that this money was illegally taken from the general fund, and that this is sufficient justification for our suit. Also, on account of lack of money to meet the interest on the bonds, warrants were issued while the railway was on a warrant basis, amounting to many thousands of dollars.
>
> During 1918 and 1919 the revenues were not nearly enough to pay for the operation and maintenance of the utility, and the same thing was true as to the year 1920. At the time our action was brought, this was only estimated as to 1921, but we can now show the standing of the railway up to 1921.

Attorneys for the taxpayers also submitted testimony in the form of a report prepared last January for Mayor Hugh M. Caldwell, showing departmental expenditures of approximately $1,250,000 from general tax funds for the benefit of the Municipal Railway during the years 1919 and 1920, and an estimated expenditure of approximately $720,000 from the same source for the year 1921, a total of almost $2,000,000.

Attorney Donworth, for the city, stated that the general fund is not in imminent danger of invasion for the railway, and that the traction system shows every prospect of standing on its own feet on the present 8⅓-cent fare, and of paying its obligations of principal and interest and maintenance and operation without resorting to taxation for support.

In the suit of the Puget Sound Power & Light Company to compel "specific performance" by the city of Seattle under the contract by which the city bought the company's railway system, Federal Judge E. E. Cushman on Dec. 19 handed down a memorandum decision ordering the plaintiff's form of decree entered as the ruling of the court. The form of decree was in part as follows:

> If the gross of revenues received are sufficient to pay the charges expressly provided in the bonds to be superior to the bonds, but are not sufficient to also pay the bonds with interest by or on March 1, 1939, payable in the manner and at the times herein before decreed, and the cost of maintenance and operation, then the city shall pay such cost of maintenance and operation out of its general fund or any fund available and cannot legally and permanently divert such gross revenues from such special fund created for the payment of the principal and interest of such bonds to the payment of cost of operation and maintenance.
>
> The city shall, out of its general fund or from some other available source, other than the gross revenue of the system, pay the cost of operation and maintenance, when not doing so will cause operation of the system or some part thereof to cease or deprive the owner of any bond issued under Ordinance 39025, of any part of the gross revenues of the sysem pledged to the special fund for the payment of the principal and interest of such bonds as herein decreed.

The decision was based largely on the opinion of the State Supreme Court, in the case of Twichell against the city of Seattle, the "friendly" suit in which the validity of the railway purchase was involved.

In ruling on the Puget Sound Power & Light Company's alleged prior claim to the gross revenues of the railway, Judge Cushman in his decision said:

> The question of complainant's claim on the gross current income for the payment of the installments of principal and interest, next falling due, is not only indirectly involved because of the necessity of its consideration in order to determine the question of default upon failing to pay into the special fund, thirty days prior to the due date; but it would appear to be directly put in issue by any refusal of the city to disclaim, confess or deny the priority of complainant's right to such gross revenue and fund. Complainant, by its bill, asserts its priority of right to the gross revenue and, in effect, pleads that, by the decision in the Twichell case it was determined that to preserve complainant's priority right in the gross revenue, the city would, if such revenue were "insufficient to meet all charges, be compelled to pay the cost of maintenance and operation by taxation or from other sources than the revenue of the property."

New Subsidiary Organized by New Jersey Corporation

The Public Service Production Company has been incorporated in the interest of the Public Service Corporation of New Jersey. It is explained that the purpose of the Public Service Corporation is to broaden its field of usefulness. The new company will be an engineering organization. It will be separate from the operating companies, confining the work of the latter to operating, pure and simple. The new company will be prepared to undertake engineering and construction work for governmental agencies, public utilities and corporations generally.

Thomas H. McCarter, president of the Public Service Corporation, said:

> There is a very large field for electric engineering and development throughout the country, a part of which the new company hopes to fill. It will also be prepared to do valuation work for public utility and industrial corporations. It also proposes to embark in the paving business upon a substantial scale. The United States Government, the various states and municipal divisions thereof, are spending and propose to spend vast amounts of money in paving, and we are of the opinion that there is room in the business for a substantial corporation which will do first-class work at fair prices.

The charter is extremely broad with respect to the activities in which the new company may engage. The papers of incorporation show that $5,000,000 of preferred stock will be issued, paying 8 per cent cumulative dividends. There will also be issued 50,000 shares of common stock of no par value.

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Financial and Corporate

$290,000,000 P. R. T. Value at 1919 Prices

The total valuation of the property of the Philadelphia (Pa.) Rapid Transit Company, as stated by that company, is $290,000,000. That was developed on Jan. 26 at the hearing in the valuation proceedings before Public Service Commissioner Clement when W. K. Myers, of the company's valuation committee testified that the going concern value was $38,000,000.

Mr. Myers in his testimony defined going-concern value as the value that exists in a complete, matured and successfully operated property with a built-up business attached as compared with a new property which is in that immure condition usually prevalent at the beginning of its operation. It includes the added value to a property usually attendant upon the consolidation of many plants into one efficient organization, the benefit of which should be reduced cost of operation and improved service He said that it also includes the added value to a property because of the development of the physical property, the management and business.

The witness explained that the $38,000,000 amounts to approximately 15 per cent of the reproductive cost as of June 30, 1919. He maintained that his estimate should be added to any base figure which the commission may decide upon as being the proper reproductive cost to use in the determining fair value.

Indiana Property for Sale

Sale of the property of the Lafayette (Ind) Service Company has been ordered in a decree issued by Judge A. B. Anderson in United States Court. The decision was reached at a hearing in the foreclosure suit filed against the company by the Real Estate Trust Company, Philadelphia, representing the holders of $225,000 of bonds. Judge Anderson directed that the decree of sale provide for disposal of the company's property in such a manner as to bring the largest return. The property is to be sold within forty days of the decree and will be offered first as a unit and if not sold then in parcels. The plaintiff will ask Charles Martindale, master in chancery, to set Feb. 18 as the date for the public sale.

One of the bidders for part of the property will be the Northern Indiana Gas & Electric Company, according to W. A. McInery, of South Bend, Ind., counsel for the company. Mr. McInery said his company wished to buy the electric railway's power plant in order to supplement the electric service now given to the city of Lafayette by the Northern Indiana Gas & Electric Company. Mr. McInery indicated that his company would buy the company's property as a unit, if necessary, but that it had no desire to operate the railway system. He said in such an event his company would endeavor to interest Lafayette capital in the development of the electric railway service.

He said that the company was not making any money as now operated by a receiver and that it was thrown into the hands of the receiver largely as a result of competition from jitneys. He said, furthermore, that capital sufficient to operate the system could not be interested in the venture so long as the jitneys were permitted to run without regulation.

Interest Charges in Seattle Will Be Decreased Considerably in 1922

Interest charges on the $15,000,000 bonds issued to Stone & Webster in payment for the Seattle (Wash.) Municipal Street Railway will be decreased in the fiscal year 1922 by $41,650, bringing the annual payment of interest on these securities down to $708,350. This will result from the payment on March 1 of the first $833,000 annual instalment of the principal of the $15,000,000 debt. The annual interest charge for 1921 was $750,000.

Figures prepared by City Comptroller H. W. Carroll show that in 1921 the accumulated deficit of the electric railway was reduced by approximately $160,000. The net profit for the eleven months ending Nov. 30 was $130,588. The profit for December has not yet been figured, but as it was a prosperous month for the railway, the accountants estimate the gain of revenues over operating costs during the last thirty-one days of 1921 at about $30,000, making the year's total profit about $160,000.

This means, the accountants point out, that the railway not only did not incur any further deficit during the year, but instead reduced the deficit which was on the books at the beginning of the period. During 1920, there was no profit, but a loss of $1,236,239. The total deficit at the beginning of 1921 was $1,184,163. Of this $1,177,696 was a charge for depreciation of the system, or the amount which should have been set aside or else expended in betterments and replacements to keep its values the same as when it was appraised in 1918 at $15,000,000.

The accountants pointed out that if this depreciation charge were ignored, the railway would have had a surplus of $118,031 in its treasury on Nov. 30, 1921, when the depreciation charge had increased to $1,801,607. In 1921, with a profit of approximately $160,000, the deficit was cut from $1,814,163 to approximately $1,653,576.

Petition for Appointment of Receiver Withdrawn

Clarence H. Venner, who as president of the General Investment Company and the Continental Securities Company, brought suit in equity on Aug. 27 in the Federal District Court at New York to place the Interborough Rapid Transit Company in receivership, withdrew the application when the hearing on the petition was resumed on Jan. 3, before Judge Julius M. Mayer of the United States Circuit Court of Appeals. Venner, through his attorney Elijah Coline, said that he withdrew the action in view of his belief that the situation has changed since institution of the proceedings.

The petitioners claimed when the suit was instituted they actually believed that a great crisis existed in connection with the financial affairs of Interborough Rapid Transit and did not believe that it would be possible to obtain an extension from the holders of the defaulted bonds.

The petitioners held, however, that despite belief that the crisis had passed great danger still remains and they asked the court for permission to file an interrogatory which would permit renewal of the application if the situation demanded.

James L. Quackenbush, attorney for the Interborough, in explaining the situation said he desired to have it understood that the petition was voluntarily withdrawn by the plaintiff and not on the request of the company. He added that although the petitioners' attitude in the proceedings was most gratifying he would not consent to withdraw motions made at previous hearings on behalf of the Interborough to dismiss the application in view of the plaintiff proposing to file an interrogatory.

San Francisco Committee to Take Up Market Street Railway Purchase

The public utility committee of the Board of Supervisors of San Francisco, Cal., on Jan. 18 appointed a committee to negotiate with the Market Street Railway as to the proposed purchase of the properties and the plan of submitting a proposition to the voters of San Francisco.

The committee is composed of Mayor James Rolph, City Engineer M. M. O'Shaughnessy, City Attorney George Lull and five members of the Board of Supervisors.

Three points are to come up for consideration in the preliminary conferences. These are (1) whether the company will sell on the "pay-as-you-go" basis, which was provided for in a charter amendment relating to the purchase of public utilities by the city and passed by the voters on Nov. 2, 1920; the idea being that the utility would be paid for out of its own earnings, (2) at what price the company will sell and (3) whether San Francisco would have to guarantee certain sums in annual payment.

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$1,117,621 Profit in Boston

From an Accumulated Operating Deficit of $5,000,000 in 1919 Road Has Been Established on Self-Supporting Basis Under Public Trustees

After making allowance for delayed charges and credits applying to the operations of previous years the receipts of the Boston (Mass.) Elevated Railway for the calendar year ended Dec. 31, 1921, exceeded the cost of service by $1,117,621. In the preceding calendar year the cost of service had exceeded receipts by $346,951. On Dec. 31, 1920, there were also outstanding deficits carried over from the year 1919 that amounted to $459,007. These obligations totaling $805,959 have been met and $311,661 paid into the reserve fund as required by law.

THESE facts together with other details of operation for the year just ended are contained in the third annual report of the board of trustees of the company made to the Massachusetts Senate and House pursuant to the Special Act of 1919.

Three years and a half have elapsed since the trustees took charge. At the end of the first year during which a 5, then a 7 and finally an 8-cent fare was in force an operating deficit of approximately $5,000,000 had accumulated which was met from the reserve fund and general taxation in the cities and towns served by the railway. In the second year with a flat 10-cent fare in force revenue practically met expenses. In the calendar year just closed, as already stated, receipts exceeded expenditures by approximately $1,117,000.

Increase in Passenger Traffic Despite Depression

Notwithstanding the general lessening of traffic upon railroads and railways which began with the industrial depression last spring on the Boston Elevated there has been an increase in number of passengers carried. The public trustees in charge of the affairs of the company attribute this as due in large measure to the experimental operation of 5-cent surface lines for short distance travel without transfer. The number of passengers now riding for a 5-cent fare is 18 per cent of the total riding. With the establishment of additional lines to be in operation within this and next month the number will undoubtedly exceed 20 per cent of the total riding. This limited local service adds to the usefulness of the railway without imposing material burden upon those who pay the basic 10-cent fare.

The trustees say that this experiment with this service has attracted the attention of transportation experts in many large cities and that "it may well lead to the adoption of some plan for a general reduction in fares upon an equitable distribution of the charge for riding."

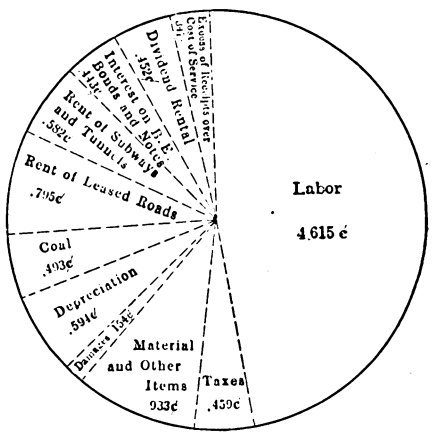
The operating costs of 1921 reflect lower prices of coal and materials, decrease in wages, the less severe conditions of the winter season and changes that have promoted efficient operation. The division of expenditures is graphically shown in the accompanying chart.

The power plant has been improved through installation of new equipment such as air compressors, soot blowers, reactance coils, air washers, feed pumps and rotary converters. Fewer tons of coal have been burned during the last year than in any of the years given in the accompanying comparative table showing the price of coal per ton and the unit of efficiency of the coal that was burned:

During the year 27.242 miles of track were constructed and 13.88 miles improved by extensive repairs. One hundred and five modern center entrance cars were received and placed in service and forty-six of the sixty-five steel cars ordered to replace an equivalent number of wooden cars in use on elevated lines were received. Several large snow ploughs have been added to the equipment. The list of useless equipment has been lessened by the disposal of obsolete cars, snow ploughs, trucks and other miscellaneous equipment.

The terminal yard at Forest Hills has been completed and the operation of trains from this yard began on Nov. 9. The trustees explain that this means efficient operation of the main line, reduces the likelihood of serious results should the Charlestown Bridge become disabled and annually lessens operating costs by eliminating nearly 1,000,000 miles of dead mileage.

12 Months Ending December 31. 1921
Average Receipts per Revenue Passenger
9.867¢



ALLOCATION OF RECEIPTS PER PASSENGER

TRAFFIC STATISTICS OF BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31.

	1921	1920	1919
Round trips operated	5,778,881	5,770,692	6,588,226
Passenger revenue	$32,253,629.59	$33,108,946.48	$28,767,544.11
Passenger revenue per car-mile; cents	64.89	64.62	53.74
Passenger revenue per car-hour	$7.361	$7.155	$6.057
Passenger revenue mileage	49,706,697	51,237,527	53,533,522
Passenger revenue car-hours	4,381,815	4,627,295	4,749,318
Revenue passengers carried	337,252,080	335,526,561	324,756,635
Revenue passengers carried per car-mile	6.785	6.548	6.066
Revenue passengers carried per car-hour	76.97	72.51	68.36

Important Rapid Transit Projects Pending

Two exceedingly important and far reaching changes in rapid transit are now pending. One involves virtually a new transit thoroughfare for the operation of three-car trains from a terminal at Braves' Field, Allston, through the Boylston and Tremont Subways and over the East Cambridge Viaduct to Lechmere Square, Cambridge, where a new terminal is being constructed. This change will substitute one large unit for several small units and through the use of trains with additional cars will mean more frequent, rapid and regular service that will materially relieve the congestion in the subway. The other change is that proposed in the lines operating on Huntington Avenue through the substitution of train for single car service. According to the trustees these two improvements furnish the only known way of relieving the congestion in the Tremont Street Subway until a permanent remedy is

COMPARATIVE PASSENGER STATISTICS
REVENUE PASSENGERS CARRIED

Year	Week-Day Average	Saturday Average	Sunday Average	Holiday Average	Total for year
1915	992,283	1,140,046	685,726	846,860	352,469,586
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1918	985,384	1,147,809	658,902	775,634	348,664,700
1919	934,918	1,078,635	596,182	706,429	324,758,685
1920	960,737	1,072,319	591,063	703,634	335,526,361
1921	975,745	1,068,295	578,860	696,691	337,352,080

COAL COSTS OF BOSTON ELEVATED RAILWAY.

	1921	1920	1919	1918	1917	1916	1915
Tons of coal burned	215,870	258,087	287,670	281,677	270,452	254,735	244,912
Pounds of coal per kilowatt-hour	2.174	2.353	2.835	2.772	2.309	2.256	2.321
Average price of coal per ton	$7.71	$10.07	$5.91	$6.26	$4.19	$3.35	$3.39
Net cost of power for car service per kilowatt-hour, cents	1.172	1.921	1.307	1.158	.620	.534	.517
Net cost of power per total revenue car-mile, cents	4.815	8.538	5.439	4.668	2.573	2.137	1.972

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BOSTON ELEVATED RAILWAY
INCOME STATEMENT

OPERATING INCOME	12 mos. ending Dec. 31, 1921	12 mos. ending Dec. 31, 1920	12 mos. ending Dec. 31, 1919
Passenger revenue	$32,237,396.47	$33,096,763.69	$28,752,675.38
Special car revenue	16,233.12	12,182.79	14,868.73
Mail revenue	578.98	737.10	722.24
Express revenue	44,154.94	88,657.99	89,002.98
Miscellaneous transportation revenue	3,838.20	4,383.17	3,001.85
Total revenue from transportation	$32,302,201.71	$33,202,724.74	$28,860,271.18
Station and car privileges	$305,937.96	$300,228.32	$293,871.62
Rent of tracks and facilities	26,051.00	39,059.11	41,477.2
Rent of equipment	1,659.83	1,644.27	5,209.40
Rent of buildings and other property	111,951.20	100,499.45	82,514.36
Power	84,932.67	92,192.00	46,349.33
Miscellaneous	20,318.76	14,514.61	74,898.45
Total revenue from other railway operations	$550,851.42	$548,137.76	$544,320.41
Total railway operating revenues	$32,853,053.13	$33,750,862.50	$29,404,591.59
Railway operating expenses:			
Way and structures	$3,021,844.18	$3,226,275.11	$3,783,715.35
Equipment	4,470,357.23	4,033,850.42	4,290,039.81
Power	2,532,500.73	4,568,991.90	2,980,658.59
Conducting transportation	10,752,382.64	11,524,823.18	10,530,882.29
Traffic	2,401.23	3,357.91	4,758.03
General and miscellaneous	2,063,570.98	2,411,823.59	2,110,285.34
Total railway operating expenses	$22,843,056.99	$25,769,122.11	$23,700,339.41
Per cent. of operating expenses to operating revenues	69.53	76.35	80.60
Per cent. of operating expenses to operating and non-operating income	68.65	75.72	80.34
Net revenue, railway operations	$10,009,996.14	$7,981,740.39	$5,704,252.18
Taxes assignable to railway operations	1,546,758.15	1,142,987.28	1,045,502.37
Operating income	8,463,237.99	6,838,753.11	4,658,749.82
NON-OPERATING INCOME			
Income from lease of road	$823.40	$823.40	$823.40
Dividend income	9,180.00	9,180.00	9,180.00
Income from funded securities	4,503.41	6,356.89	6,280.50
Income from unfunded securities and accounts	375,158.65	233,379.60	42,853.06
Income from sinking fund and other reserves	33,280.00	28,853.33	33,280.00
Miscellaneous income	1,026.94	2,180.72	1,565.27
Total Non-operating income	$423,972.40	$280,773	$94,991.23
Gross income	$8,887,210.39	$7,119,527	$4,752,741.05
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads:			
West End Street Railway	$2,630,780.24	$2,590,258.15	$2,540,892.94
West End Street Railway—Tremont Subway	182,512.32	177,686.09	176,545.11
Other roads	48,914.48	48,303.71	57,793.99
Total rent for leased roads	$2,862,207.04	$2,816,247.95	$2,775,232.04
Miscellaneous rents	$1,781,225.46	$1,612,746.21	$1,339,501.90
Net loss on miscellaneous physical property	6,959.96	9,325.77	7,986.10
Interest on funded debt	1,292,800.00	1,307,018.75	1,309,477.08
Interest on unfunded debt	201,458.43	207,945.23	246,312.98
Amortization of discount on funded debt	31,468.08	34,860.38	44,290.46
Miscellaneous debits	16,279.55	14,881.50	8,070.37
Total deductions from gross income	$6,192,398.52	$6,003,025.79	$5,730,870.93
Net income transferred to credit of profit and loss	$2,694,811.87	1,116,501.26	*978,129.88*
Proportion of dividends	1,523,367.00	1,463,668.50	1,403,970.00
Balance after cost of service	$1,171,444.87	*$347,167.24*	*$2,382,099.88*

Note—Figures in italics indicate deficits.

BOSTON ELEVATED RAILWAY
OPERATING EXPENSE ACCOUNTS

WAY AND STRUCTURES	1921	1920	1919
Superintendence of way and structure	211,850.11	194,428.55	189,806.92
Maintenance track and roadway (except snow and ice)	1,724,134.42	1,162,612.96	2,784,370.28
Removal of snow and ice	63,460.07	615,548.70	18,549.67
Roadway structures	96,630.14	79,253.48	78,838.28
Signal and Telegraph and Telephone lines	23,370.33	45,728.82	40,125.98
Other miscellaneous way expenses	14,012.13	19,163.99	80,608.36
Maintenance for electric line equipment	278,348.00	264,490.05	251,258.31
Maintenance of buildings, fixtures and grounds	335,038.98	348,048.56	296,957.55
Depreciation of way and structures	275,000.00	17,000.00	43,200.00
Total way and structures	$3,021,844.18	$3,226,275.11	$3,783,715.35
EQUIPMENT			
Superintendence of equipment	142,844.54	136,169.08	130,546.65
Maintenance of cars	1,640,767.49	1,699,568.11	1,550,450.88
Maintenance of electric equipment of cars	628,477.20	804,309.30	593,667.37
Shop expenses	275,822.05	326,959.57	272,509.31
Miscellaneous equipment, vehicles, horses, etc	53,445.95	44,844.36	38,545.60
Depreciation of equipment	1,729,000.00	1,022,000.00	1,704,320.00
Total equipment	$4,470,357.23	$4,033,850.42	$4,290,039.81
POWER			
Superintendence of power	79,834.66	85,059.57	78,597.01
Maintenance of power plants	337,746.70	457,635.12	328,835.05
Depreciation of power plant buildings and equipment	.....	965,000.00	256,480.00
Operation of power plants	2,114,919.37	3,061,297.21	2,316,746.53
Total power	$2,532,500.73	$4,568,991.90	$2,980,658.59
CONDUCTING TRANSPORTATION			
Superintendence of transportation	990,478.82	1,008,465.02	870,231.52
Passenger conductors, motormen and trainmen	7,041,863.84	7,646,971.90	6,858,788.30
Freight conductors, motormen and trainmen	12,150.78	15,715.67	20,450.89
Miscellaneous car service employees	311,922.91	296,455.06	267,635.58
Miscellaneous car service expenses	155,427.67	206,948.02	236,186.71
Station employees	720,736.44	735,178.90	819,994.25
Station expenses	183,938.93	219,632.87	199,113.16
Carhouse employees	873,312.15	920,926.65	859,285.35
Carhouse expenses	59,941.20	75,141.23	75,298.44
Operation of signal and telegraph and telephone lines	221,537.17	214,559.69	168,891.80
Other transportation expenses	181,072.73	184,828.17	155,006.35
Total conducting transportation	$10,752,382.64	$11,524,823.18	$10,530,882.29
Traffic	2,401.23	3,357.91	4,758.03
GENERAL AND MISCELLANEOUS			
Salaries and expenses of general officers and clerks	412,724.08	408,825.79	389,588.64
General office supplies and expenses	81,760.91	198,992.05	78,026.75
Law expenses	62,180.47	35,941.44	20,142.84
Relief department expenses, pensions and graituities	60,291.17	43,837.44	34,743.75
Miscellaneous general expenses	75,270.56	75,865.97	68,941.20
Injuries and damages	665,798.02	785,971.56	830,663.98
Insurance	287,406.21	372,849.38	274,052.74
Stationery and printing	92,120.81	108,569.70	82,991.60
Store, garage and stable expenses	286,504.07	350,969.92	294,184.04
Rent of tracks and facilities	24,212.73	13,998.99	13,789.55
Rent of equipment	15,301.95	16,001.35	23,160.25
Total general and miscellaneous	$2,063,579.98	$2,411,823.59	$2,110,285.34
Total operating expenses	$22,843,056.99	$25,769,122.11	$23,700,339.41

provided through the enlargement of the facilities which this subway affords. In conclusion the trustees say:

In the return to a better financial footing with assurance of ability to procure sufficient revenue to meet the costs of service the trustees welcome the opportunity to deal more liberally with questions of accommodation for the public and less attention to drastic measures aimed merely at economies. It is now possible without abandonment of business methods or disregard of economies that make for efficient service to decide upon the merits, requests involving additional usefulness and larger convenience for the car riding public.

Recommendations for legislation have been duly filed in accordance with law and now appear as Public Document House No. 63. One of them relates to the issue of bonds to provide capital for the completion of repair shops at Everett. The shops now in use are the inheritance of horse car days, wholly unfit to meet every day needs in painting, repairing and caring for rolling stock. The annual saving that would follow the use of the shops which have been planned would be very large.

Utility Commissioners Concerned Over Depreciation Case

Opposition to transfer of jurisdiction over rates of depreciation of the Washington Railway & Electric Company from the District of Columbia Public Utilities Commission to the Interstate Commerce Commission is made by the National Association of Railway & Utility Commissioners.

The association, according to its general solicitor, John E. Benton, desires to make the issue a test case. It claims that if jurisdiction over rates of depreciation of the local electric railway is transferred from the District Utilities Commission to the Interstate Commerce Commission, it might lead to the taking from all state utilities commissions the power to fix rates of depreciation for street railways and transfer it to the Interstate Commerce Commission.

Seattle Withholding From Peter to Pay Paul

Accumulation of the $1,240,000 fund to meet the various items of indebtedness of the Seattle (Wash.) Municipal Street Railway falling due between now and March 1, has been completed, with a surplus of approximately $4,000.

To accumulate the fund, the railway has been on a warrant basis since Dec. 24, and warrants of the railway are now outstanding in the sum of $599,581 bearing interest at 6 per cent, and honored by local banks. City Treasurer Collier stated that the city would probably redeem the warrants on Feb. 1.

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Lower Fares, but Not Increased Patronage

Cincinnati electric cars carried 320,000 fewer passengers in December, 1921, than in the month of December 1920, despite the fact that the rate of fare was a full cent less per ride. This is shown in the financial statement of the Cincinnati (Ohio) Traction Company received by William Jerome Kuertz, Street Railway Commissioner.

The actual number of revenue passengers at a 7½-cent fare in December was 9,216,583 in the preceding December 9,535,949 revenue passengers were carried at an 8½-cent fare. In actual earnings the railway received $100,180 less in December, 1921, than in the preceding December. Yet the month showed a surplus of $23,153—just offsetting the November deficit—while in December, 1920, there was a deficit of $64,157.

The deficit was due to both higher operating expenses and the fact that the company was then paying the city franchise tax. Earnings for December, 1921, totalled $723,004 and expenditures $699,851. The figures for December, 1920, were: Earnings, $823,184; expenditures, $887,340.

$620,046 Surplus in Baltimore

According to figures made public on Jan. 26 by President C. D. Emmons of the United Railways & Electric Company, Baltimore, Md., there were 15,843,199 fewer passengers carried last year than in the year before, and 5,799,986 fewer than were carried in 1919. The total number carried last year was 238,090,980, which represents a loss of 6.24 per cent as compared with the previous year, but that year the increase in this traffic was 4.12 per cent over 1919.

While fewer passengers were carried, the car miles on the company's lines last year totaled 35,708,000, as against 35,522,000 in 1919. With this loss in traffic the company was able to come through the year with a surplus after all expenses and fixed charges of $620,046, as compared with $1,045,650 in 1920.

This surplus was about $280,000 less than has been estimated as necessary by the Public Service Commission and about $780,000 less than the commission has estimated should be earned to keep the company's property and service at the best standard, but even this $620,046 was made possible only by the strictest economies even with a 7-cent fare.

Many of the economies were not forced upon the management until about the middle of the year, when it became apparent that the expected improvement in conditions was not to mamaterialize soon.

Total revenues from all sources last year were $16,325,066, a decrease of $988,532; operating expenses were $9,940,861, a decrease of $465,722; depreciation was put at $816,253, a decrease of $49,246, leaving net operating revenue of $5,567,951, a decrease of $473,383. Taxes amounted to $1,736,700, a decrease of $28,713, and fixed charges to $3,310,437, an increase of $17,111. Non-operating income of $99,233 added to the gross income left the net surplus as stated.

December traffic was greater than that of any previous month since July, which is unusual and indicates that further improvement may be expected after the present slack season is over.

$529,237 Balance in Washington in 1921

The financial condition of the Washington Railway & Electric Company, Washington, D. C., and its subsidiaries showed substantial improvement during 1921. According to the report of William F. Ham, president, submitted to the annual meeting of stockholders on Jan. 21 the earnings, subject to revision on final audit, were:

Gross earnings from operations, $5,455,623; miscellaneous income, including dividends from the Potomac Electric Power Company, $654,511. Gross income, $6,110,135. Operating expense, including depreciation, taxes and miscellaneous charges, $4,382,937; interest on funded and unfunded debt, $772,960; payment of 5 per cent dividend on preferred stock, $425,000. Total, $5,580,897. Deducting this from gross income leaves balance for the year 1921 credited to profit and loss of $529,237.

In discussing this Mr. Ham said:

> From the foregoing statement it will be seen that the company has made material progress as compared with recent years. With the exception of dividends from the Potomac Electric Power Company, no income was received by the Washington Railway & Electric Company on its investments in stock of subsidiary companies. It is, however, gratifying that the subsidiary railway companies show an operating profit to the parent company (without any allowance for return upon investment) of $30,005, as compared with an operating loss of $199,798 in 1919.

There was a noticable increase in the efficiency of employees in each and every department. This is well illustrated by the reduced turnover in labor, as evidenced by the number of new trainmen employed. During 1921 only 285 new trainmen were put into the service, compared with 667 in 1920, and 1,270 in 1919.

The expenditures and allowances for maintenance and depreciation of track and roadway again reached large proportions, the total for the year being $1,081,615.

During the first eight months of the year the rate of fare within the District of Columbia was 8 cents cash or tickets at the rate of four for 30 cents, during which period the average fare was 7.53 cents per pay passenger. By order of the Public Utilities Commission of the District of Columbia, effective Sept. 1, 1921, the rate of fare was reduced to 8 cents cash or tickets at the rate of five for 35 cents, such rate to continue in force until March 1, 1922. This reduced the average fare during the last four months of the year to 7.06 cents per pay passenger.

Financial News Notes

Right Sought to Issue $2,272,000 Bonds.—The Illinois Traction System, Peoria, Ill., has asked the Illinois Commerce Commission for permission to issue $2,272,000 first refunding bonds, to bear 5 per cent interest and maturing on Dec. 1, 1939.

No Bidders for Bonds.—No bids were received by City Comptroller Harry W. Carroll on the proposed $680,000 issue of street railway utility bonds, with the proceeds of which the City Council of Seattle planned to finance the retracking of First Avenue. The fact that there are already several bond issues, including the $15,000,000 railway bonds which would be superior liens against the system, was given by officials as an explanation for the absense of bidders. The bonds were publicly advertised.

Expenditures Approved for Terminal Entrance.— Judge John M. Killits in Federal Court at Toledo, Ohio, has granted to B. J. Jones, receiver for the Ohio Electric Railway, an order permittng him to buy a share of stock in the Toledo Interurban Station Company for $100, make a deposit of $500 with that company and expend about $4,000 to make necessary track connections to enter the downtown district over the tracks of the Community Traction Company. Mr. Jones was also authorized to pay a power bill of $3,121 made with the Toledo Edison Company for electric current delivered to Lima and points along the Ohio Electric Railway between Toledo and Lima.

Dividends Ahead for Eastern Massachusetts Issues. — The Boston *News Bureau* says that the capital readjustment plan of the Eastern Massachusetts Street Railway trustees having been declared operative, it is expected inauguration of dividends on first preferred stock will follow in due course. Present authorized amount of first preferred is $1,027,700 and assuming that the entire $3,239,000 sinking fund stock is exchanged for first preferred under the plan, the maximum possible amount outstanding will be $4,266,700. To pay dividends on this issue will require surplus earnings of a little more than $250,000 per annum. For the 1921 calendar year the Eastern Massachusetts earned more than the full cost of service as permitted under the special act, viz., $2,400,000. Bond interest and rentals of leased lines amount to $1,600,000 a year, indicating a leeway of $800,000. In fact, the road is earning so much more than would be necessary for paying full dividends on first preferred as to suggest that preferred B stock also is steadily wheeling into line for dividend consideration.

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Traffic and Transportation

Preliminary Report Submitted

Engineer Vanneman Sees Flaws in System—City Partially to Blame for Interference With Service

Charles R. Vanneman, chief engineer of the New York Public Service Commission, has submitted a preliminary report on the service provided by the United Traction Company, Albany, N. Y. An investigation had been requested of the commission by P. L. Merriman, a lawyer of Albany, who charged the traction company with giving inadequate service.

Mr. Vanneman said that his observations of travel on Jan. 5 and 6 led him to make certain suggestions to the United officials on improvement of service. Checks made on these observations on Jan. 18 and 19 showed that the improvements had been effected, but that twenty-one additional trips should be provided during the evening rush hours. To relieve this rush-hour condition extra conductors board the cars carrying standing loads on Pine Hills, Delaware Avenue and West Albany line to expedite the loading and unloading. Employees have been stationed at various places to sell tokens and to assist in the rear door alighting. At the suggestion of the investigators additional employees were stationed at State and Pearl Streets to speed up the loading and the unloading.

To what extent the operation of the one-man car is instrumental in causing poor service was explained in detail by Mr. Vanneman in this report. After studying this operation of the past two months Mr. Vanneman gives seven factors involved in the one-man congestion which is apparent since the termination of the strike. They are as follows:

1. Unfamiliarity of a large number of new employees with the new cars, as well as the routes.
2. Unfamiliarity of old men taken back with one-man operation.
3. Unfamiliarity of the public with one-man operation, and an apparent unwillingness to move to the rear of the car.
4. Inadequate supervision by the officials, especially during the rush hours.
5. Interference of vehicular traffic, especially on North Pearl Street.
6. Since the snow has come, interference of vehicles, both wilful and unavoidable.
7. Increased time required in loading and unloading by one-man cars.

In making suggestions for the lessening of the congestion Mr. Vanneman suggests that the company acquaint its employees thoroughly with the one-man car apparatus and now and then examine all operators to see that they are thoroughly familiar with the various devices used. He further believes that an extensive publicity campaign should be waged by the traction company informing the public of the need for "passing to the rear of the car."

As to the fourth cause, namely, inadequate supervision, Mr. Vanneman emphasizes the need for prompt dispatching which should begin with the supervising force and be passed on to the operators whose co-operation is absolutely necessary.

The report stresses as a great interference with service by the United Traction the unlimited parking rules on North Pearl Street between State Street and Clinton Avenue, the operation of an increasing number of W. I. A. T., Delmar and Stingerlands buses and the interference by vehicles where snow removal has not been undertaken by the city. The city should abolish these interferences.

As a possible relief for the increased time required for loading and unloading one-man cars, Mr. Vanneman believes that the rear-entrance front-exit type with the pay-as-you-enter system is the best for one-man car operation, though he feels such a plan is impossible just now in Albany.

Following a conference between Mayor Hackett and H. B. Wetherwax, vice-president of the United Traction Company, announcement was made that new schedules would be put into effect to improve service. It is unofficially reported that the city will urge the railway to put into service many of the old and experienced men employed by the company previous to the strike of January, 1921, so that the cars will be operated by trained employees.

Passenger Traffic Increasing

Sixty-three million passengers were carried last year on the interurban, suburban and Akron, Canton and Massillon city lines of the Northern Ohio Traction & Light Company. Despite the fact that 1921 business showed a sharp decline from that of 1920, traffic is now steadily increasing on all lines, as indicative of a general improvement in business conditions throughout the territory.

The company's figures show 33,000,000 passengers carried on the Akron city lines, as compared with 49,000,000 in 1920; about 16,000,000 on the interurban and suburban systems, as compared with 20,000,000 the year before last; 11,000,000 in Canton, or 4,000,000 fewer than 1920, and 1,600,000 in Massillon, as compared with 2,000,000 the preceding year. The heavy passenger records of 1920 are attributed largely to the fact that the first six months of 1920 covered an area of peak prosperity for all the cities, including Akron.

Although the gross revenue for 1921 will be lower than that of 1920, the net revenue is expected to show a slight increase, attributed to decreased operating costs.

Plan Through Interurban Service

Indianapolis Lines Anticipate Extension of Runs to Points in Four Mid-West States

Extension of through interurban service centering in Indianapolis, Ind., whereby that city may have direct connection with points over four central west states, including Ohio, Indiana, Michigan and Kentucky, is being planned by executive officers of many of the interurban systems in the Central Electric Railway Association. Further extensions may be made to include eastern coast territory.

The Terre Haute, Indianapolis & Eastern Traction Company was one of the first railways of the central Indiana division to establish through service. Four trains are run daily by it each way between Indianapolis and Dayton, on a four-hour schedule. This service was started in the latter part of December, and substitutes, in a measure, for through service that formerly prevailed between Indianapolis and Zanesville, Ohio, discontinued because of hindrances that arose as the result of the unscrambling of the Ohio Electric Railway under the receivers.

The Union Traction Company, which has its main offices at Anderson, has contemplated the establishment of through service between Indianapolis and Toledo and Cleveland, via Fort Wayne and Lima, but it is said that the plan has been given up. Connections with the two northern terminals are available through a through rate in effect, but a change of cars is necessary at Lima and Fremont.

Indianapolis will have direct interurban connection with downtown Cincinnati if plans of the Indianapolis & Cincinnati Traction Company to extend its main line from Rushville to the Ohio metropolis are carried out. The proposed extension will be by way of Metamora, Brookville and Harrison, which is on the state line, striking Cincinnati corporation line at Westwood, thence into the city, 5½ miles over the track of the Cincinnati-Westwood line, then on Queen City Avenue to the two-tube subway being built from Canal and Walnut Streets up the old Miami canal bed to Brighton.

C. L. Henry, president of the railway, said the company had held options on the Cincinnati & Westwood property for about six years and that the purchase and building of the 3,000-ft. stretch would follow the completion of an engineering survey. Decision as to the time of beginning construction work, he said, would depend on bond market conditions.

The extension of the Rushville line will give the company 111½ miles of main line trackage. The line from Rushville, southeast, will be through virgin territory and, according to Mr. Henry, will add greatly both to the freight and passenger business.

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Auto Immeasurably Inferior

Jitney Service Is Maintained at Least in Part at the Expense of Trolley Riders

The Public Service Railway, Newark, N. J., has issued a statement replying to an article in the Newark *News* on a comparative census taken by the Public Utilities Board of electric railway and jitney traffic. The statement follows in part:

In its issue of Dec. 28, the *News* printed an interesting article based on a partial census of jitney and street car traffic made by the Board of Public Utility Commissioners.

The word "partial" is used advisedly because the statistics admittedly did not cover non-competitive routes, and of the eleven routes referred to no cognizance was taken of traffic handled by the street cars on such portions of said routes that the jitneys did not attempt to serve.

Unless this fact be understood and kept in mind, the figures given will present a distorted picture of the comparative service rendered by the two systems. The truth is that in the metropolitan district of Newark—practically coincident with Essex County and West Hudson—the electric railway carries over three times the number of persons transported by jitneys. Moreover, the trolley routes constitute a unified and co-ordinated system, providing communication between various parts of the district and by means of transfers make this communication possible at a cost (for all but short hauls) below that charged for a like amount of service supplied by jitneys. On the other hand, the operation of the jitneys is not so co-ordinated, and in consequence the number of passengers carried by jitneys and by cars over any particular route is not a true measure of the comparative use of the two facilities.

Is it not apparent that the standard of bus service does not approach the standard of electric railway service, and that no fair comparison of the rates charged by the two systems is possible without an allowance for the marked difference in the quality of service?

As was stated before, the test of any local transportation system is its ability to handle the peak load, which under conditions prevailing in this district is the evening rush load, the traffic between 4:30 and 6:30 p.m. Unless the system is capable of taking care of this maximum demand it fails to meet public requirements. On the other hand, if it satisfactorily meets this test it is necessarily in a position to take care of the traffic at all other periods of the day.

The Utility Board's figures prove that the jitney bus cannot take the place of the street car. The figures also prove that by slightly increasing the number of trips the street cars alone could handle all the rush hour traffic now handled by both street cars and jitney with more comfort to the passenger than the jitneys now afford that portion of the traffic carried by them.

Since this is true in the rush hours it follows that the traffic for the other hours of the day could be efficiently handled by street cars alone. Incidentally it might be interesting to recall that prior to May, 1916, there were from 480 to 500 car movements over the intersection of Broad and Market Streets every day during the "peak" hour, whereas the present scheduled number of movements is 365 during the busiest sixty minutes of the day. Rerouting, owing to the opening of the Terminal, accounts for the changed conditions.

As it is, jitney service is being maintained, at least in part, at the expense of those who patronize the street cars. Even if it were likely that the communities would long permit an exclusive local transportation system, the low service standard which makes it possible for the jitneys to exist, it is evident that it is only because the street cars bear the bulk of the transportation burden and assume the most costly part of the performance that the jitneys can function under existing conditions, and that were they to attempt to perform all the service they would fail in Newark as they have failed wherever the trial has been made.

In a recent editorial the *News* suggested that the local transportation tangle might come to such a pass that the part of wisdom would be to remove from electric railway operation all public restrictions, except on financial transactions, and let the trolley and jitney battle to a finish for the right to survive. In commenting on this suggestion the railway says that without attempting to forecast the result of such a contest it may be properly pointed out that were the jitney to win the consequent service to be secured by the public would be jitney service, according to jitney standards, in no way comparable with the service given by the street cars and in all respects immeasurably inferior.

Skip-Stop Returns to Indianapolis

Indianapolis is going back to the skip-stop and middle-of-the-block loading and unloading in the downtown district, according to a verbal order issued recently by the Board of Public Works to Dr. Henry Jameson, chairman of the board of directors, and Robert I. Todd, president of the Indianapolis Street Railway. Seventeen platforms to aid passengers to board the cars and alight from them will be placed soon in the downtown districts to facilitate traffic conditions. This action by the Board of Public Works carried out a suggestion made last week to the board by a committee representing the Indianapolis Chapter of the American Association of Engineers.

Five-Cent Fare Extended Three Months

The City Council of Akron, Ohio, at a meeting on Jan. 24 decided to extend the temporary 5-cent fare agreement with the Northern Ohio Traction & Light Company. The agreement expired on Feb. 1 and will now be continued until May 1. If the emergency franchise had not been extended the fare would have reverted to the old rate of six tickets for 25 cents.

According to a statement issued recently by the traction company the city cars carried only 34,322,022. passengers in 1921 against 54,937,862 in 1920. With gross earnings for the year amounting to $1,769,349 and operating expenses including taxes but not including interest charges or depreciation amounting to $1,835,619 the company claims a deficit for year of $66,070.

$2,884 Loss on Bridgeport Division

A report submitted to the Public Utilities Commission at Hartford, Conn., by President L. S. Storrs of the Connecticut Company, Hartford, Conn., concerning the operating results of the Bridgeport division, for the week ended Jan. 21 as compared with like days of the last week of the flat 10-cent fare, shows a loss of $2,884. A similar report to the commission and a comparison for the Norwalk division, which is also undergoing the 5-cent fare experiment, shows a gain of $161.17. The trial test of the 5-cent fare in both cities is for a period of ninety days, and will terminate in a few weeks.

Brooklyn Enters Whalen Bus Plan

Brooklyn, N. Y., is included in plans for a city bus system which Grover A. Whalen, commissioner of plant and structures for New York City, has submitted to the Board of Estimate. Commissioner Whalen's plan includes the substitution of bus routes numbering between 97 and 159 for the trolley lines. The change involves a $25,000,000 expenditure.

In advocating the plan the commissioner said:

It must be recognized that the trolley system of transportation in this city has broken down. It cannot be rehabilitated financially. The plan of an adjustable fare, the "barometer" scheme, would merely be giving oxygen to a comatose system, stimulating the market in traction issues, enabling insiders to unload, doubling fares and postponing for years any real solution of the city's traction problem.

The first step in abolishing trolley service in the borough of Manhattan would be to eliminate fifteen car routes as follows:

Broadway-Seventh Avenue, Ninth Avenue, Eighth Avenue, Sixth Avenue, Madison and Fourth Avenues, Second Avenue, Avenue B, Eighty-sixth Street (crosstown), Forty-second Street (crosstown), Thirty-fourth Street (crosstown), Twenty-third Street (crosstown), Fourteenth Street (crosstown), Eighth Street (crosstown), and Grand Street (crosstown).

The proposal of Mr. Whalen will be dealt with at greater length in the issue of Bus Transportation for February.

Plans of Mayor John F. Hylan and other city officials of New York, N. Y., for supplanting surface trolley lines of the city with buses were whipped into more concrete form at a recent public hearing of the Board of Estimate when Comptroller Craig moved that the Corporation Counsel make a formal statement as to just what steps could be taken to tear up the tracks of trolley lines that have already abandoned service. The hearing was made public in order that interested parties might discuss the bus plan projected by Mayor Hylan, which involves the tearing up of all surface tracks, and the issue of $25,000,000 corporate stock for construction, equipment and housing of 3,500 motor buses.

Fare Case Taken to State Supreme Court

The suit instituted in the Civil District Court against the Commission Council of New Orleans, La., by Attorney-General Coco, which was dismissed for want of action, has been taken to the State Supreme Court by the Attorney-General. The official just mentioned sought to deny the authority of the Commission Council to enter into an agreement with the New Orleans Railway & Light Company on a rate of railway fares below that named in its franchise. The matter will probably receive early consideration by the Supreme Court, which has, at the request of the Attorney-General, granted an advance hearing of the suit by placing it on the preferred docket of the court. Feb. 27 has been fixed as the date for the hearing. The city of New Orleans has not yet filed its answer.

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Oles After the Jitneys

According to the Youngstown *Times* of Jan. 15 Mayor George L. Oles snatched time that day between granting interviews to out-of-town newspapermen and posing for movie photographers to reverse himself on a plank of his now famous platform—that calling for "throwing out the street cars and turning the streets over to the jitneys." Mr. Oles said:

> Life is too short to spend arguing with jitney drivers and the quack lawyers who come in to intercede for them.
>
> I am convinced that if the jitneys were abolished the street car fare would be 5 or 6 cents instead of 9 cents. I have already cut the number of jitneys 50 per cent by refusing licenses to men with any police record.

Oles has issued orders for enforcement of jitney regulations including one requiring a $10,000 bond, and another requiring that the interiors of all jitneys be lighted. He urged Council not to repeal the rule requiring owners and drivers to be American citizens.

Interurban Rates Advanced by Detroit United

The interurban rate of fare of the Detroit United Lines has been made 2 cents a mile instead of 1½ cents. New tariffs under the law have been filed with the Michigan Public Utilities Commission. The new rate is in accord with and under the authority of the Glaspie act governing interurban fares.

The Glaspie act authorizes the commission to appraise interurban railway properties and fix rates of fare in accord with operating expenses, maintenance of the property and a fair return upon the investment. This appraisal is now under way and when completed the commission will be able to act officially as to the necessary rates.

The Glaspie act has, however, an interim provision fixing certain temporary rates in accord with the gross receipts of the lines but absolutely without regard to the expense of operation. Under this temporary provision when the gross receipts per mile of main line track exceed $14,000 a year the fare rate is to be 1½ cents. The Detroit United earnings in 1920 were such as to compel this cent and a half rate. In 1921, however, there was a marked recession in business with the result that the gross interurban earnings fell to slightly more than $12,000, and this gross earning automatically placed the temporary rate of the company at 2 cents a mile.

While it would be permissable for the company to collect an interurban rate to and from the interurban depot in Detroit, the company will continue to apply the present rate of fare within the so-called one-fare zone.

The interurban mileage rate will continue to be from Six-Mile road on Woodward Avenue for the Pontiac and Flint Divisions; from Leesville on Gratiot Avenue for the Leesville Railway; from the Country club on Jefferson Avenue for the Shore line; from Addison on Michigan Avenue for the D., J. & C. railway, from the Junction on West Fort Street for the D., M. & T. Short Line railway, and from Turner Y on Grand River Avenue for the Orchard Lake division.

Outbound interurban riders on Woodward, West Fort and West Jefferson continue to pay the combined city and interurban fare under the agreement of joint city operation on these routes. Interurban fares for children under 12 years of age continue at half rates with a minimum collection of 5 cents.

Will Establish Resort Within Easy Reach of Trolleys

The establishment of bathing places along the lines of the system is a project that is being worked out by the officials of the Monongahela Power & Railway Company, Fairmont, W. Va., to meet young people's demands which have been growing in West Virginia communities for years. If the proper sites can be secured the company will likely establish one or two of these resorts within easy distance of each of the important cities of its lines.

It will not be the intention of the company to operate the beaches, but to secure the locations and turn them over to capable people for the operation. Officials have been looking over the ground with the intention of finding a suitable bathing place in the vicinity of Fairmont.

Sault Ste. Marie Fare Increased to Seven Cents

Seven cents is now the fare on the lines of the Sault Ste. Marie (Mich.) Traction Company. The increase was granted on order of the Public Service Commission, which stated:

> It appears in the testimony that a great many more people travel on tickets purchased at twenty for a dollar than on the straight cash fare. It also appears that the average fare for travel is .059, and that the average fare necessary to meet the operating expenses is 07. We find further that even though this commission does grant the new rate the company will still fail to receive sufficient revenue to meet the operating expenses alone, unless more passengers are carried.

Transportation News Notes

Ticket Fare Reduced.—Officials of the Adrian (Mich.) Street Railway announced recently, following the annual meeting, that the 10-cent fare would remain. Tickets, however, will be sold at the rate of six for 40 cents instead of 50 cents.

Through Freight Rates Established.—The Jamestown, Westfield & Northwestern Railroad, operating between Jamestown and Westfield and connecting with the Pennsylvania Railroad at Mayville and the New York Central and Nickel Plate railroads at Westfield, has inaugurated through freight rates over its line in connection with the Pennsylvania lines at Mayville.

Will Consider Fares.—The Public Service Commission has announced that it will hold a public hearing in Hoquiam, Wash., in the near future to consider electric railway fares of the Grays Harbor Railway, Light & Power Company. The present fare is 10 cents or three for a quarter, for both local and inter-city rates, Hoquiam to Aberdeen. It was fixed by the commission sometime ago, but has caused considerable protest from residents of both cities.

Jitney Business Unpopular in Wisconsin.—The jitney business has not proved permanently popular in Wisconsin. The Railroad Commission records show that during the past year sixty-three bonded carriers filed cancellations of their bonds, and that approximately one-third of the carriers who started in the business during 1921 did not stay with it for the year. High operating costs and lower competing street car fares are given as the reason for its unprofitableness.

P. A. Y. E. Cars Will Be Installed.—Plans for rerouting the traction lines of Jamestown, N. Y., and the placing in operation of P. A. Y. E. cars are now being made by A. N. Broadhead, president of the Jamestown Street Railway. Under the present arrangements cars operating over various lines meet in the center of the city at a central waiting room and then return over their various routes. Present plans provide for consolidating the routes so that through service will be maintained and then the waiting room can be abolished.

Protest Establishment of Motor Truck Line.—The Valley Railways, Lemoyne, Pa., and the Conestoga Traction Company, Lancaster, Pa., together with the Pennsylvania, Reading & Susquehanna River and Western Railroads, are protesting the issuance of a certificate of convenience to the Pyramid Haulage Company to conduct a motor freight service between Harrisburg, York, Lancaster, Gettysburg and points in Juniata, Cumberland and Lykins valleys. They are contending that the service is not needed.

Interurban Wins Steam Road Passengers.—The Lake Erie & Western Railroad, a steam line, with headquarters in Indianapolis, Ind., has discontinued its through train from Fort Wayne to Indianapolis and is now transferring passengers at Muncie as formerly. This condition of affairs has increased the patronage on the through interurban trains operated between Fort Wayne and Indianapolis by the Indiana Service Corporation. For the purpose of still further increasing the patronage on these trains the Indiana Service Corporation has recently been advertising extensively for the Hoosierland and the Wabash Valley Flyer, the corporation's two principal trains running between Fort Wayne and the state capital.

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Personal Mention

Two Ohio Companies Make Changes

G. D. Nicoll Appointed Engineer Indiana, Columbus & Eastern—F. J. Foote Is Superintendent

Appointments for the new year have been made on the Indiana, Columbus & Eastern Traction Company and the Columbus, Newark & Zanesville Electric Railway, Springfield, Ohio. G. D. Nicoll becomes chief engineer of both companies with direction of structures and power plants, substations and overhead lines and the distribution and sale of electrical energy. F. J. Foote becomes superintendent of motive power and equipment in charge of mechanical operation of power plants and substations and in charge of the rolling equipment, car shops and houses. For twelve years he has been connected with the Ohio Electric Railway, Cincinnati, which leases both of the above companies. He was at first the Ohio Electric Company's master mechanic, and in June of last year was appointed superintendent of power. For some time past he has been supervising the power houses and substations of the Columbus, Newark & Zanesville and Indiana, Columbus & Eastern Traction companies.

W. L. Clayton, who has acted as chief dispatcher of the Ohio Electric and assistant superintendent of the Columbus-Dayton division since 1917, will now hold the post of superintendent of the Indiana, Columbus & Eastern Traction Company, in charge of transportation of the Dayton-Union City, Dayton-Columbus and Columbus-Orient divisions.

Another appointment of interest is that of A. C. Starkey as superintendent in charge of transportation of the Springfield-Lima and Lima-Defiance divisions. On the Columbus, Newark & Zanesville Electric Railway, F. G. Clunis has been advanced to the position of superintendent of the Columbus-Zanesville and Newark-Granville divisions, and B. S. Watters of the Zanesville City Railway. G. B. Darnell will have charge of the maintenance of way and structures of all divisions of this company as roadway engineer. A. E. Peckham, as roadway engineer for the Indiana, Columbus & Eastern Traction Company, will have charge of Springfield-Lima and Lima-Defiance divisions.

A. V. Bland has been made assistant to J. H. McClure, receiver of the Indiana, Columbus & Eastern company.

Changes Made in Supervisory Forces

The Public Service Railway, Newark, N. J., announces the following changes in supervising forces. Aaron H. Hill, supervisor at Roseville, becomes assistant division superintendent. Frank Lindner, depot master at Roseville, has been made supervisor at Roseville. William Eckert, station master at Hilton carhouse, has been made supervisor of the Bergen Street carhouse, and Arthur Symington, supervisor of the West New York carhouse.

Mr. Arkwright Carries On

President of Georgia Railway & Power Company Puts in Force Decided Innovations

Preston W. Arkwright, the energetic president of the Georgia Railway & Power Company, Atlanta, Ga., is hitting the bull's-eye with phenomenal success in dealing with the public and with employees. His are no pot-shots. They are carefully aimed, coolly executed and sure of the mark. In other words, to leave the field of the marksman, Mr. Arkwright is that person known as a successful leader of an electric railway.

"MR. ARKWRIGHT AND HIS BABY DAUGHTER"

Lenny, Photographer

"MR. ARKWRIGHT AND HIS DAUGHTER'S BABY"

If one thing more than another can be said to account for Mr. Arkwright's excellent administration since he became president in 1912, it is ideas faithfully carried to completion. It is mere reiteration to recall Mr. Arkwright's former rôle as Moses in leading the Georgia Railway & Electric Company from that troublesome land of public dislike and financial distress into the promised land of public trust and pecuniary success. Through straightforward dealings, Mr. Arkwright made the company famed for the civility and kindness of its employees, and for its liberal and fair treatment of the public.

So much for history, but Mr. Arkwright continues to give historians a chance to scribble a few notes. He has, for example, not let well enough alone in the company's relation to a public which he will not damn, but constantly is striving to make traveling safer, quicker, more enjoyable. Ergo, this latest innovation in Atlanta: Thirty supervisors of the company have been given complete police authority. They are clothed in the regulation supervisor uniform of the company, but in addition they wear the regulation police badge on cap and coat. The men who are assigned to the down-town district also wear a medallion on the left arm, signifying that they are members of the traffic squad. These men are all provided with rainy-day uniforms—white rubber coat, cap and boots—which mark them plainly on gray days. In white or in blue, it is Mr. Arkwright's idea that the Georgia Railway & Power Company's men shall be constantly on the job to serve.

One thing Mr. Arkwright has never forgotten, namely, that his company is made up of human beings and that his company is constantly serving human beings. An observer of Mr. Arkwright's activities recently remarked, "There is a man who is filled with the milk of human kindness." A recent manifestation of this kindness and fairness is the wage agreement between the company and the employees in which no attempt was made to reduce the wages below what were paid in 1921. Instead a new method was used whereby a new wage scale was instituted for men employed after Jan. 1 as motormen or conductors, and in shops and carhouses.

Mr. Arkwright's life has been spent almost exclusively in the South. He was graduated from the University of Georgia in 1891, studying law during his last year there. He began the practice of law in Atlanta and ten years later championed the cause of the unification of the electric railway and lighting systems of the city into the Georgia Railway & Electric Company. From 1902 until 1912 as president he guided the development of the utility company, but in the latter year resigned to become president of the Georgia Railway & Power Company, which leased the former property.

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Mr. Greenland Honored Again

Popular Operator in Charge of Fort Wayne Lines Is Selected to Head Central Association

Samuel W. Greenland, newly elected president of the Central Electric Railway Association, is vice-president and general manager of the Indiana Service Corporation, Fort Wayne, Ind. This company owns and operates the electric railways in Fort Wayne, Wabash, Peru and Logansport, and the interurban lines connecting Fort Wayne with these cities and with Lafayette and Bluffton, Ind., and does a general power and lighting business.

Mr. Greenland's selection to head this important railway association comes after long interest and activity in the work of the association and bespeaks the well-placed confidence and esteem with which he is held by the members generally. Calm, energetic and aggressive in striving for the betterment of his company and its service, and with a broad, sound view of the utility field, he is respected by his contemporaries and associates, and has that wholehearted respect and loyalty and good will of his employees which makes for best company and public relations.

Mr. Greenland was born at Clarion, Pa., on April 27, 1879, and was educated at the Pennsylvania Military College, Chester, Pa., and at Penn State University, where his work in electrical engineering was concluded in 1900. His first job in the utility field was with the Bell Telephone Company at Pittsburgh in connection with construction work. In 1904 he became connected with Robert W. Watson, consulting engineer, Harrisburg, Pa., where for three years he was engaged principally in making engineering reports for financial interests. In 1907 he became general manager of the Columbus Railway, Light & Power Company, which furnishes the gas, electric light and railway services in Columbus, Miss. At the time the Wabash Valley Traction Company was reorganized to become the Fort Wayne & Northern Indiana Traction Company, in 1911, he went to Fort Wayne as assistant general manager and later in the same year was made general manager. Upon the reorganization of this company into the Indiana Service Corporation in 1920, he was elected vice-president as well as general manager.

In addition to his connection with the Indiana Service Corporation, he is general manager for the receiver of the Fort Wayne, Van Wert & Lima Traction Company, general manager of the Fort Wayne & Decatur Traction Company, and president of the Service Coal Company, Fort Wayne.

Mr. Greenland has been an officer of the Central Association for the past three years and a member of the executive committee for some five years. He is a member of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers. He has been active in local affairs and is a past president of the Rotary Club of Fort Wayne. He is also active in the work of the American Electric Railway Association, and is now a member of the committees of that association on the trackless trolley and one-man car. In 1917 he served as president of the Indiana Electric Light Association. During the war he was a major in the chemical warfare section of the army and had charge of the erection of a 20,000-kw. steam generating station at the Edgewood (Md.) Arsenal. He also looked after the operation of the utilities at Edgewood.

Mr. Collier at Poughkeepsie

W. Rawson Collier has resigned as general sales manager for the Georgia Railway & Power Company, Atlanta. He has been connected with the company at Atlanta for ten years in the capacity mentioned and is nationally known in public utility circles as an engineer acquainted with all features of gas and electric service. He will take an important executive position with the Central Hudson Gas & Electric Company, Poughkeepsie, N. Y. He will be succeeded at Atlanta as sales manager by his brother, C. A. Collier, who has been assistant sales manager since 1914.

Mr. Collier has been associated with the Georgia Railway & Power Company since 1905, when he entered the company's engineering department. Three years later he became contract agent and in 1912 was promoted to the position of sales manager. During 1919 and 1920 Mr. Collier was both sales and operating manager.

His technical education Mr. Collier received at the Massachusetts Institute of Technology, where he was graduated in 1900. He entered the firm of Collier & Brown after finishing college, designing and constructing many electric lighting plants in the Southern states.

Phillips General Manager in Muskogee

John G. Phillips, for many years manager of electric railway properties, has been appointed general manager of the Muskogee (Okla.) Electric Traction Company, and the Shawnee-Tecumseh Traction Company, Shawnee, Okla. He succeeds A. B. Coryell, who has been serving temporarily since the resignation of W. M. Cutlip in November of last year.

From 1920 to 1921 Mr. Phillips was general superintendent of the Mobile Light & Railroad Company, Mobile, Ala. Before taking that position he was with Ford, Bacon & Davis, engineers, doing valuation work for them. Mr. Phillips was previously purchasing agent and superintendent of rolling stock of the Hudson Valley Railway, Glens Falls, N. Y., and for some time was assistant general manager of the company operating there.

N. B. Rhodes Park Purchaser of New Orleans

Norman B. Rhodes, New Orleans, who has had a long and varied experience with public utilities north and south, has been appointed superintendent of purchases for the Board of Park Commissioners of New Orleans. After graduating from the Cheltenham Military College, Mr. Rhodes entered the service of the Richmond Railway & Power Company, Richmond, Va., and later that of Stone & Webster, at Savannah, Ga. He was superintendent of the Beaumont (Tex.) Traction Company and of the Southern Railway & Light Company, Natchez, Miss. He left his position as superintendent of the electric and railway departments of the Jackson Light & Traction Company, Jackson, Miss., to enter the navy at the beginning of the war. He was on duty at the Algiers Naval Station and afterward supply officer of the U. S. S. Edgar F. Luckenbach until the close of the war.

R. F. Busher, who has for some time been chief of the Bureau of Accounts and Statistics of the Public Service Commission of Pennsylvania, has resigned from that position. On Feb. 1 he will enter the practice of public accounting.

Samuel Riddle, vice-president of the Louisville (Ky.) Railway, was elected a director of the Louisville Board of Trade at the annual meeting on Jan. 10. This is the first time that a representative of the railway has even been on the directorate of the Board of Trade.

Roy L. Duncan, for the past ten years in the employ of the Connecticut Company, Hartford, Conn., and its predecessors as foreman of the welding, grinding and bonding department at the Hartford division, has left the employ of the company. He is to take a position as service man in the New England territory for the Rail Welding & Bonding Company of Cleveland, Ohio. Mr. Duncan has been presented with a traveling bag and equipment by members of the track department. He assumed his new duties on Feb. 1, and his work will take him to all points in New England.

Fred Durant, Troy, N. Y., was recently appointed traffic superintendent of the Trenton & Mercer County Traction Corporation, Trenton, N. J. He is an electric railway executive with wide operating experience. He secured a position as conductor in 1893 with the Troy & Lansingburg Traction Company and after working at that position for a time became a motorman. Later he was promoted to inspector, and in 1917 was advanced to the position of division superintendent with quarters at the North Troy carhouse. In 1900 the Troy & Lansingburg and the Troy City Traction companies were merged under the name of the United Traction Company and Mr. Durant remained with the new company in the same position.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Steel Pole Sales Increase

There are many inquiries for steel poles and investigation discloses that these queries are the forerunners of much proposed spring construction. There are quite a number of combination railway and lighting pole jobs awaiting favorable action but electric railway companies are buying only such poles as are necessary, on account of their generally poor financial condition. On the other hand, central station companies and those municipalities owning their own lighting poles are in much better financial condition. One solution of the problem put forward by an interested manufacturer, is to have the lighting company collect sufficient funds to provide steel poles for lighting and charge a proportion of their cost to the electric railways for use as span supports. One company reports some export inquiries.

Current prices are said to be on a level with those prevailing in June, 1916. There was a general drop in prices during the last quarter of 1921. The market at the present moment is firm, and it is doubtful whether there will be any further downward reduction for some time to come. Deliveries are good, ranging from thirty to sixty days on tubular steel poles and one to three weeks on steel towers.

The outlook, manufacturers agree, is for better business all through 1922 than during 1921. The increase is expected to be very gradual but permanent.

Good Prospects for Electrical Exports in 1922

Optimism over the prospects for American exports of electrical equipment this year is expressed by E. D. Kilburn, vice-president and general manager of the Westinghouse Electric International Company.

Mr. Kilburn points out that America leads the world in many electrical lines and can compete with any nation in these lines in spite of her high labor costs. He also states that German competition need not be feared, for Germany's manufacturing capacity is limited, and that when she has obtained a certain amount of electrical business her deliveries will become uncertain and her prices will rise.

During the past year both Chile and Japan placed large orders for electrical material in America and there is every reason to believe that we will receive an increasing amount of business of the same character. Every generator installed immediately creates a market for at least three times its capacity in smaller apparatus, such as transformers, meters, industrial motors and domestic ware. Hence the demand for electric appliances increases in a geometrical ratio and America is in a fair position to get its full share of this rapidly growing business.

Signal Contract Awarded

The Philadelphia & Garrettsford Street Railway has awarded a contract for the complete installation of new electro-pneumatic interlocking at its Sixty-ninth Street terminal, Philadelphia, to the Union Switch & Signal Company. The layout includes forty-three functions, consisting of twenty-one switches and twenty-two signals, which will be controlled from twenty-three working levers in a twenty-three-lever frame electro-pneumatic interlocking machine. Style "C" cut-off switch valves will be used throughout.

All new signals will be of the style "N" color light type. Alternating-current track circuits will be installed throughout the interlocking so as to provide for semi-automatic control of signals and electric detector locking.

Electrification of Swiss Federal Railways

Commerce Reports for Jan. 30 states that 57,000,000 francs have been credited in the Swiss budget of 1922 for electrification of the Federal railways. It is hoped that the electrification of the Bellinzona-Lugano-Chiasso, the Erstfeld-Lucerne and the Goldau-Zug lines will shortly be completed. The Amsteg power station, of 80,000 hp. will be ready to furnish energy about April, 1922, and the Lucerne-Zug-Zurich line will probably be electrified by the end of the year. Together with the St. Gothard, the Sion-Lausanne line is to be electrified, and will be opened in the summer of 1923. The current will be supplied by the 60,000 hp. Barberine station

Lumber Demand Increases After Holiday Slump

Reports from various mill centers to the American Wholesale Lumber Association indicate a slow recovery in lumber demand for the first week after the usual holiday recession. Production was at 68 per cent of normal, new business at 59 per cent of normal, and shipments at 62 per cent. Yellow pine orders exceeded fir orders for the first time since Dec. 3, 1921. On the Pacific Coast both rail and export orders fell off, although moderating weather permitted rail shipments in excess of the last of November, 1921.

ELECTRIC RAILWAY MATERIAL PRICES—JAN. 31, 1922

Metals—New York

Copper, electrolytic, cents per lb.	13.31
Copper wire base, cents per lb.	15.12½
Lead, cents per lb.	4.40
Nickel, cents per lb.	32.00
Zinc, cents per lb.	4.85
Tin, Straits, cents per lb.	32.00
Aluminum, 98 to 99 per cent, cents per lb.	19.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.72
Somerset mine run, Boston	1.87
Pittsburgh mine run, Pittsburgh	2.15
Franklin, Ill., screenings, Chicago	1.92
Central, Ill., screenings, Chicago	1.52
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard Bessemer steel rails, per gross ton	40.00
Standard open hearth rails, per gross ton	40.00
Railroad spikes drive, Pittsburgh base, cents per lb.	2.22
Tie plates (flat type), cents per lb.	2.00
Angle bars, cents per lb.	2.40
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.12½
Steel bars, cents per lb.	1.50

Hardware—Pittsburgh

Wire nails, cents per lb.	2.50
Sheet iron, (24 gage), cents per lb.	2.85
Sheet iron, galvanized, (24 gage), cents per lb.	3.55
Galvanized barbed wire, cents per lb.	3.15
Galvanized wire ordinary, cents per lb.	2.75

Waste—New York

Waste, wool, cents per lb.	13.00
Waste, cotton, (100 lb. bale), cents per lb.	
White	10.00
Colored	9.00

Paints, Putty and Glass—New York

Linseed oil, (5 bbl. lots), cents per gal.	77.00
White lead, (100 lb. keg), cents per lb.	12.25
Turpentine (bbl. lots), cents per gal.	93.00
Car window glass (single strength), first three brackets, A quality, discount*	85%
Car window glass (single strength), first three brackets, B quality, discount	86%
Car window glass (double strength, all sizes, A quality), discount	85%
Putty, 5 lb. tins, cents per lb.	4.75

*These prices are f.o.b. works, boxing charges extra.

Wire—New York

Rubber-covered wire, cents per lb.	6.50
Weatherproof wire base, cents per lb.	16.00

Paving Materials

Paving stone, granite, 4 x 8 x 4, f.o.b. Chicago, dressed, per sq.yd.	$3.25
Common, per sq.yd.	3.00
Wood block paving 3½, 16 treatment, N. Y., per sq.yd.	2.17
Crushed stone, ¾ in. carload lots, N. Y. per cu.yd.	1.80
Cement, Chicago consumers net prices, without bags	1.97
Gravel, ¾ in. cu.yd. N. Y.	1.75
Sand, cu.yd. N. Y.	1.00

Old Metals—New York

Heavy copper, cents per lb.	10.87½
Light copper, cents per lb.	8.37½
Heavy brass, cents per lb.	5.125
Zinc, old scrap, cents per lb.	2.25
Yellow brass, cents per lb. (Heavy)	5.50
Lead, heavy, cents per lb.	3.62½
Steel car axles, Chicago, net ton.	$12.75
Old car wheels, Chicago, gross ton.	12.25
Rails (short), Chicago, gross ton.	15.25
Rails (rerolling), Chicago, gross ton	12.25
Machine turnings, Chicago, net ton	4.75

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Standard Underground Makes Changes in Personnel

The Standard Underground Cable Company, New York City, N. Y., has sent out an announcement of the following changes in its sales organization: Atlee B. Saurman has been appointed general sales manager, with headquarters in Pittsburgh, Pa.. Mr. Saurman has been with the company over twenty years, during which period he served for several years as manager of the Boston office, for twelve years as manager of the Pacific Coast department, with headquarters at San Francisco, and for the past seven years as manager of the Southeastern sales department, with headquarters at Philadelphia, Pa. Edward Kerschner has been appointed manager of the new Southeastern sales department, with headquarters in Washington, D. C. Mr. Kerschner has been for many years past connected with the Pittsburgh and Philadelphia offices and, since it was established, manager of the Washington district office. A sub-office of the sales department will be continued in Atlanta, Ga., with J. A. Peacock in charge as formerly. F. O. Hoyt, formerly and for many years on the staff of the company's New York Sales department, has been appointed manager of the Philadelphia sales department, which department will have charge of eastern Pennsylvania, southern New Jersey and Delaware.

Tramway Concession in India

According to press reports, the Dehra Dun Mussoorie Electric Tramway has been registered in India with the object of building a tramway between Dehra Dun and Mussoorie, the necessary concession having been granted by the United Provinces Government. The preliminary estimate of the cost of the work is 3,662,000 rupees.

Further information relative to this project can be obtained from the Electrical Equipment Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., by referring to Miscellaneous Exhibit No. 229.

Rolling Stock

United Electric Railways, Providence, R. I., has just placed an order for twenty-five new standard type one-man cars with Osgood-Bradley Company. Delivery is promised for March.

Chicago (Ill.) Surface Lines lost seventy-eight passenger cars and twelve miscellaneous service cars in the fire which destroyed the Devon Avenue carhouse on Jan. 26. The property damage was $1,000,000. Further details of the fire are published elsewhere in this issue.

Los Angeles (Cal.) Railway has started reconstruction of 106 cars. The program will occupy the greater part of 1922 giving a maximum number of cars available for the heavy traffic of next Christmas. The cars to be rebuilt are known as P. A. Y. E. No. 2 and they will be converted into P. A. Y. E. No. 1. Instead of a single step at the rear the cars will have a double step divided for exit and entrance. They will be lengthened from 39 ft. 1½ in. to 44 ft. 6 in., giving two more seats and larger loading platforms. The estimated cost of the work is $212,000. A similar program was carried out in 1921. The 1922 work will bring all passenger cars up to modern standards.

The Kentucky Traction & Terminal Company, Lexington, Ky., has purchased ten semi-steel cars for interurban service between Toledo and Sylvania, Ohio. The cars are 40 ft., 3 in. long and have a seating capacity of forty-four. The bodies will have curved sides and the exterior will be finished in chrome yellow. Arch-bar trucks will be used with a 5-ft. wheelbase and 26-in. diameter steel wheels. Other details of the equipment include General Electric type 264 motors, K-35 control, C.P. 27 compressors, G.E. type J-12 headlight with resistors and a 500-watt lamp. The seats will have plush upholstering and automobile spring cushions, and arm rests. The cars are being built by the Cincinnati Car Company, and will weigh 25,000 lb.

Track and Roadway

Dallas (Tex.) Railway is at work installing block signals and electric switches on its Belmont-Vickery line.

Durham Public Service Company, Durham, N. C., is laying new rails on Chapel Hill Street.

British Columbia Electric Railway Vancouver, B. C., will start work right away on the double-tracking of Cook Street.

Shreveport (La.) Railways will start work on filling in its tracks on Jacobs Street, the line in Marshall Street, in Park Avenue and in Lillian Street. The tracks will be plotted with grass.

Kitchener, Ont.—A by-law will be submitted to the ratepayers providing for the raising of $63,000 for extending the railway line east along King Street, for a double track and for the corporation's share of the cost of a station on King Street, east.

Shops and Buildings

Aurora, Elgin & Chicago Railroad, Aurora, Ill., has been authorized by Federal Judge Evan A. Evans to erect an $8,000 freight house at Aurora. This will obviate the necessity for the company to run its freight cars into the business district and will relieve congestion there.

Pacific Electric Railway, Los Angeles, Cal., and the Southern Pacific Company have authorized establishment of a joint freight terminal in Long Beach on the west side of the flood control channel near Seventh Street. Work will start as soon as the city has given permission. The Southern Pacific will abandon its Broadway tracks and freight depot and yards, and the Pacific Electric Company will discontinue its use of the freight yard at Fifth Street and American Avenue. This company will reach the new depot over its San Pedro and Wilmington tracks on Commercial Street.

Trade Notes

Bridgeport Brass Company, Bridgeport, Conn., announces the personnel of its executive staff as follows: F. J. Kingsbury, chairman of the board; Carl F. Dietz, president and general manager; W. R. Webster, vice-president; F. J. Kingsbury, treasurer; R. I. Neithercut, secretary; W. D. Blatz, general sales manager; W. R. Clark general works manager; E. G. Oakley, works manager fabricating division; Arthur Brewer, works manager mill products division.

Dwight P. Robinson & Company, New York, N. Y., already doing large construction work for the Brazilian Government in northeastern Brazil, was awarded the contract for construction of the exposition building which will hold the exhibits of the United States at the Brazilian Exposition in September. The exposition will open Sept. 7 and is in commemoration of a century of Brazilian independence. The White House recently announced that the American building would be constructed and designed for permanent use as embassy headquarters.

New Advertising Literature

The Hardinge Company, Inc., New York, N. Y., has issued a new bulletin, No. 12, on the Quigley fuel systems, comprising the preparing, transporting and burning of pulverized fuels.

Ward Leonard Electric Company, Mount Vernon, N. Y., has issued a booklet describing its various types of "vitrohm" (vitreous enamel) field rheostats. The company is also distributing a four-page leaflet covering the Ward Leonard automatic motor starter of the counter emf. style.

Corliss Carbon Company, Bradford, Pa., has issued a new catalog No. 7 giving information about the selection and application of carbon brushes. This contains data on the physical characteristics of brushes as well as their composition, mechanical details and the various grades of manufacture.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just published Leaflet 1,825, describing arc welding for repair and reclamation, general applications of arc welding and arc welding for manufacturing processes. A story is told of how costs are reduced by the use of arc welding.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors
HENRY H. NORRIS, Managing Editor
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ROBERT M. HAIG, Special Consulting Editor

Volume 59 New York, Saturday, February 11, 1922 *Number* 6

Look at the Doughnut, Not at the Hole

IN BOOM times it is perhaps just human nature to look at the doughnut, and in times of depression it is probably just as much human nature to look only at the hole. (Now, some good New Englander must not spoil this discussion by saying that this figure is all wrong because what we are talking about is a "fried cake" or a "cruller" and not a doughnut—every one knows what we mean, anyway.)

This country, as we have all talked about repeatedly, has been through, and is still in, a period of depression which is admittedly severe. *But our future subsistence is not in the hole of the doughnut.* Now is the time to look at the substance and see what we have upon which to subsist.

To explain one evidence of our first figure, in times of depression we always talk about men out of employment, and in boom times how many men are employed. If we reverse the process today, we will note that 85 per cent of the people of the United States are employed and at wages whose real buying power is higher than it has been in twenty-five years. It is this condition which proves that the future, and the immediate future at that, is substantial and sound.

Electric railways and the manufacturers who supply their needs have been as gloomy as the rest of the country; more gloomy at times, as a matter of fact. But today, the railways, almost more than other businesses, should study the substance of the doughnut and not the hole, for there is tangible proof of the solid substance of railway business today. In addition, the general sense of security of the business of the nation as a whole, when the actual positive facts are considered, should indicate a permanence of improved conditions upon which secure business growth may be predicated.

Action Is Urged Against the Tax Exempt Security

THE Oregon Chamber of Commerce recently passed a resolution urging Congress to take the necessary steps to eliminate the tax exempt features from government, state and municipal securities. What is wanted is something to make effective the phrase in the Sixteenth Amendment to the Constitution of the United States which says that Congress shall have power to levy taxes against income "from whatever sources derived."

The effect which the tax exempt security has upon the desirable growth of productive business of the country, particularly regulated business, is very great and very real. But the situation is one in which it is difficult to interest the average citizen and also, apparently, the average Congressman. It will be only by an intense educational campaign that the public will be made to appreciate how the tax exempt security militates against the growth and success of those productive enterprises which make business and opportunity for every one, and also against the growth and successful operation of the public utilities from which this same public desires added service.

Every railway should join directly and actively in this campaign of education. And the arguments must appeal directly to the self-interest of the man addressed. He will not act in such a matter out of pity. It must be brought home to him what it means to him.

The American Electric Railway Association has just circulated the Oregon resolution to its member companies. The resolution is printed elsewhere in these columns also. The association advisedly suggests that member companies, as one step to take in this campaign, urge other chambers of commerce to take similar action. This should be done. Keep active any good move which will help toward the desired end.

The tax exempt security should go! It is bad for American business!

Commissions in Their Relations to the Judiciary

WRITERS on the history of jurisprudence point out that courts of equity were established to bring to the administration of justice remedies not possible, or at least not easily secured, through common law. Men in all times have found difficulty in framing laws so general as aptly to meet every particular act and not fail in some circumstances, and they have therefore sought some tribunal other than the law courts for certain special problems. Originally, equity in England was administered by the ecclesiastics, and it was thought that precedents could have no place in its administration, as the purpose was to judge each case purely on its merits. Although this idea has since been somewhat modified both in England and America, equity practice is still available for those who cannot find in common or statute law the remedies they seek, and the decisions rendered in equity are characterized by a greater degree of discretion on the part of the presiding judge.

Within the last fifteen years still another form of tribunal, so to speak, has been developed in the American body politic, and if the causes for its creation should be traced back, they will be found to be largely the same as those which led to the establishment of courts of equity. These modern new tribunals are the public service commissions, which, under the statutes creating them, have received very broad powers to decide questions which, as with an equity court, call for wide discretion. Many of these questions are not matters of what can be done or what cannot be done under the law. Instead, they relate to what is best for a community from a business, social or engineering standpoint. Thus a commission, in a sense, is a judicial body with power to render decisions as to rates which

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greatly affect the value of property. At the same time, many of its duties are of a legislative or executive nature, in that it can prescribe ways of carrying out various lines of business, such as methods of accounting and the extent of the services to be rendered. Owing to these somewhat diverse duties, special knowledge of law, engineering or finance is extremely helpful to a commissioner, but as his office is not primarily a legal, financial or engineering one, the commissioner should be more than a lawyer, financier or engineer. There is no doubt that commission rules, when properly administered, can cure many evils not capable of solution by previously existing tribunals or at least not so easily and quickly cured by them. The innovation of their establishment was a daring one, but experience has shown that the conception was sound.

The thoughts outlined above are suggested by a rather severe attack on the idea of commission government in a report recently presented to the New York Legislature by a committee of the judiciary of the state to report on proper amendments to the judiciary article in the New York State Constitution. It may be that commission government is capable of being improved in form, and that it is possible of abuse and evils. This is not surprising in view of the recent creation of commissions.

It should not be forgotten that the legal procedure of the present day is the result of centuries of experience from the time when the court was a tribal chief, at once prosecuting attorney, judge and jury in every case, and sometimes executioner as well. Each successive change as years rolled by in legal procedure to prevent arbitrary or partial decisions, as by the separation of the functions of judge and jury, and the establishment of rules for the admission of evidence, was a gain to civilization. It is obvious that knowledge obtained through such long experience of the best means of administering justice should not lightly be cast aside, even in commission hearings.

Nevertheless, it is not difficult for one to see in the establishment of commissions some of the same purposes which led to the creation of equity courts, and there is no reason why the movement should not be as permanent in the latter as in the earlier case.

Riding Two Horses—or One?

THE only electric railway official in California who gave any indication to the publishers of this paper that he did not approve of the publication of BUS TRANSPORTATION before the paper was issued said that he thought it would be difficult for the editors "to ride two horses at once." By this statement, presumably, he meant he believed it impracticable for them to publish articles and editorials helpful to both bus systems and electric railway systems, because the interests of the two must be antagonistic.

Actually, there should be no antagonism between the two interests. The ELECTRIC RAILWAY JOURNAL is not "trying to ride two horses," but only one, namely, transportation. Or, if there are two, they are a span. There are certain places where the bus is most desirable, others where the electric railway is the logical system to use.

The development of the bus has made possible service over a great many routes which would never support an electric railway. The economy possible when large numbers of cars are operated makes the electric railway far superior to the bus for a great many other cases.

It is to the interest of all that the proper economic position of each transportation agency should be determined, that there be no waste from duplication or the attempt to use either system under conditions notably unsuitable for it. The community served is equally as interested in this matter as the company because it must eventually bear at least a part of the cost of an unsuitable system. Obviously, then, it is most important for all concerned that the development of the newer system should be along such lines that it will most quickly fill the place for which it is best adapted.

This task is the one to which BUS TRANSPORTATION is devoted.

Hobnob with the Actual Patron

WE HAVE said before that [illegible] good business to join in the choruses of the [illegible] Club in your town and otherwise take an acti[illegible] share in the business and civic organizations of th[illegible] community; but we repeat that fine as this may be it [illegible] down to the great masses whose purse suit[illegible] the automobile. Our suspicions i[illegible] firmed recently when we had the [illegible] the answers of part-time, no-time [illegible] car riders to a questionnaire wh[illegible] one of those managers who wa[illegible] the facts.

Like so many others he had seen [illegible] ing these latter months by 10, [illegible] Unlike others, however, he was not [illegible] fatalistic words "Industrial depr[illegible] traffic reports and let it go at t[illegible] times were hard, but he also knew [illegible] ing company was doing quite as w[illegible] and that the live wires of the dist[illegible] ing up pretty well. Was there an [illegible] or fares that he could remedy to g[illegible] money and more net?

He could not find the answer fr[illegible] in the newspapers or was told at [illegible] popular in the first place; and in t[illegible] of these friends are too well he[illegible] car fare or gasoline bills. So he [illegible] workers in shop, store and office w[illegible] these: "Where do you work? Wh[illegible] you ride in? Do you ride back? I[illegible] lunch? Would lower fare help you [illegible] What's wrong with our fares and w[illegible] with our cars and why?"

It is too soon to give the results [illegible] but one thing is certain: The management now knows exactly where all the tender spots are and is setting about to remove them—especially in devising fare plans that will give people the increased rides they want to take. In the meantime, the hundreds who answered are feeling better in having got a load of sorrows off of their several chests. When the remedies are announced, also, they will have the rare pleasure of feeling that they had a personal share in securing improvements and so will pay more attention than otherwise to any plan offered.

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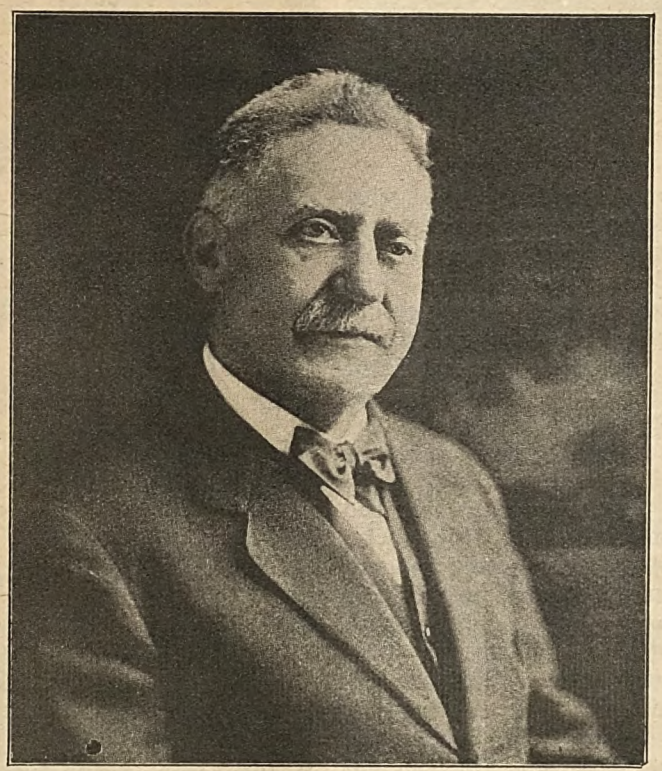
High-Class Interurban Service in Utah

The Bamberger Electric Railroad, Connecting the Largest Two Cities of Utah, Has an Attractive Route Between Lake and Mountains—With Modern Equipment and High-Class Service, Its Continued Success Is a Natural Result

BY M. L. CUMMINGS, JR.
Utah Power & Light Company, Salt Lake City, Utah

THE Bamberger Electric Railroad forms the center link of a chain of three electric interurban railroads and operates between Salt Lake City on the south and Ogden on the north—the largest two cities in Utah. Connecting with the Bamberger on the north is the Utah-Idaho Central, running from Ogden, Utah, to Preston, Idaho, and on the south the Salt Lake & Utah, running from Salt Lake City to Payson, Utah.

Serving directly, as it does, the largest two cities in the state, and along its lines, which cover a distance of approximately 40 miles, one of the richest agricultural sections of the state, the Bamberger road handles a large and ever-increasing amount of passenger and freight traffic.



SIMON BAMBERGER, EX-GOVERNOR OF UTAH, AND FOUNDER OF THE BAMBERGER ELECTRIC RAILROAD

The Bamberger Electric Railroad takes its name from Simon Bamberger, its founder, who, more than thirty years ago, conceived the idea of constructing a railroad to provide local service between Salt Lake City and Ogden. In spite of considerable opposition and pessimism and dissuasion of his friends, Mr. Bamberger, with practically nothing but his own resources, succeeded in constructing, bit by bit, the so-called "dummy line" (this by reason of the operation of boxed-in steam locomotives) until Ogden was reached in 1908.

Originally incorporated as the Great Salt Lake & Hot Springs Railway, in the very early '90s, it passed through reorganization and became the Salt Lake & Ogden Railway Company, and for many years operated as such. The history of its development is a tribute to the fortitude and genius of Simon Bamberger.

Two years after the completion of the line into Ogden, in May, 1910, the road was electrified, although steam locomotives were continued in freight service only, until the year 1914. The electrification resulted in a marked increase in the traffic and earnings of the road, and the "dummy line" soon became known as the Bamberger line, or the Bamberger Electric, which name was officially adopted on Aug. 14, 1917.

The road is capitalized for $1,500,000, the stock being owned by Simon Bamberger, chairman of the board of directors; his son, Julian M. Bamberger, president and general manager, and their immediate family.

The road serves directly a population of approximately 175,000. Although primarily a passenger line, considerable freight business has been developed during the past few years. This is constantly increasing, and if the company is successful in obtaining the establishment of through rates between its line and the Union Pacific Railroad and its connections the freight revenue will be greatly increased. The company already has joint tariffs with the Denver & Rio Grande Western, the Western Pacific, the Southern Pacific, the Utah-Idaho Central, the Salt Lake & Utah, and to some degree with the Oregon Short Line.

Many industries directly tributary to its lines are served by this road, most of these industries being located at Salt Lake City and Ogden. The intervening territory consists largely of prosperous agricultural communities and flour milling centers and comprises some of the richest fruit lands in Utah. The most important industries served in Salt Lake City and Ogden are classified about as follows: Coal yards, motor car companies, wholesale dry goods companies, warehouses, candy manufacturing companies, sand and gravel companies, lumber companies, wholesale drug companies, oil refineries, State of Utah good roads warehouse, brick manufacturing companies, United States government arsenal, U. S. Government Bureau of Public Roads warehouse, box manufacturing companies, and wholesale grocery houses.

FINANCIAL AND OPERATING STATISTICS

Operating statistics for the years 1919 and 1920, including freight, express and passenger business, are as shown in the table on page 226.

Much care and attention is devoted to the maintaining of rolling stock in first-class condition, and much of the latest type of this class of equipment is now in service on the Bamberger road.

There are fifteen motor cars in passenger service. These were built by the Niles Car Company, Niles, Ohio. Five are combination passenger and baggage and ten passenger cars. These vary in length from 56 to 60 ft., with a capacity of fifty-six passengers for the combination cars and sixty-two to seventy for the

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OPERATING DATA, BAMBERGER ELECTRIC RAILROAD

	1919	1920
Passenger car mileage	745,196	1,017,427
Freight, mail and express car mileage	265,597	322,857
Total car mileage	1,010,793	1,340,284
Passenger car-hours	25,875	30,596
Freight, mail and express car-hours	35,287	36,625
Total car-hours	61,162	67,221
Regular fare passengers carried	1,219,290	1,232,833
Total revenue passengers carried	1,219,290	1,232,833
Total passengers carried	1,219,290	1,232,833
Employees and others carried free	81,657	102,341
Passenger revenue	$494,625.15	$550,786.20
Average fare per revenue passenger	0.40403	0.44676
Total revenue from transportation	657,014.03	743,373.82
Revenue from transportation per car-mile	0.65000	0.55464
Revenue from transportation per car-hour	10.74219	11.05865
Total revenue from other railway operations	7,226.94	9,859.22
Revenue from other railway operations per mile	0.00715	0.00736
Revenue from other railway operations per car-hour	0.11816	0.14667
Total operating revenues	$664,240.97	$753,233.04
Operating revenues per car-mile	0.65715	0.56200
Operating revenues per car-hour	$10.86035	$11.20532
Total operating expenses	407,353.33	527,280.63
Operating expenses per car-mile	0.40300	0.39341
Operating expenses per car-hour	6.66024	7.84399

passenger cars. Each of these cars is equipped with four G.E. motors, 125 hp. each, multiple-unit control, Westinghouse combined straight and automatic air valve, one compressor, Baldwin trucks, and 36-in. Standard Steel Works rolled steel wheels; they are electrically heated with Westinghouse heaters. These motor cars, which weigh 41 tons each, are capable of operating at very high speed pulling a single trailer.

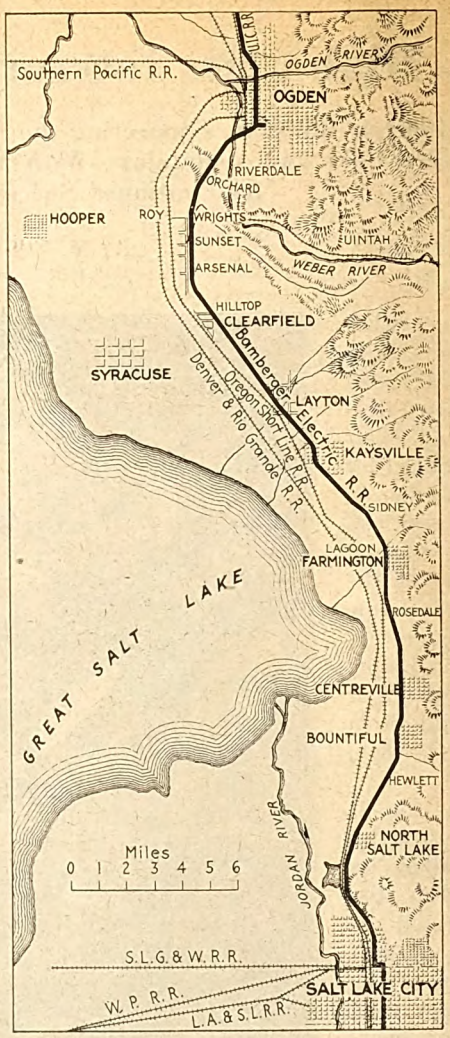
There is a total of seventeen trailers, eleven of which are closed, two are open excursion trailers, and four express and baggage trailers. The average length is 55 to 60 ft.; the weight 27 to 30 tons; and each is equipped with electric heat. They are mounted on Baldwin trucks.

Four electric 42-ton locomotives are in operation, each equipped with four G.E. motors, of 125 hp. each. These have air blower ventilation, multiple-unit control, Westinghouse air brakes, with two compressors; Baldwin trucks and 36-in. rolled steel wheels. Each locomotive can handle a 400-ton train on a 1 per cent grade.

In addition to the above there are forty-eight freight cars, of which thirty-one are box cars, thirteen flat cars, twenty gondola flat bottom, and four combination ballast and beet cars.

The miscellaneous rolling stock equipment consists of one motor line car, one 58-ft. motor baggage and express car, one 42-ft. baggage and express car, fifteen 5-yd. dump construction cars, one caboose, one line car trailer, one tool and wrecking car, one 2½-yd. Marion steam shovel, and one ¾-yd. Thor steam shovel.

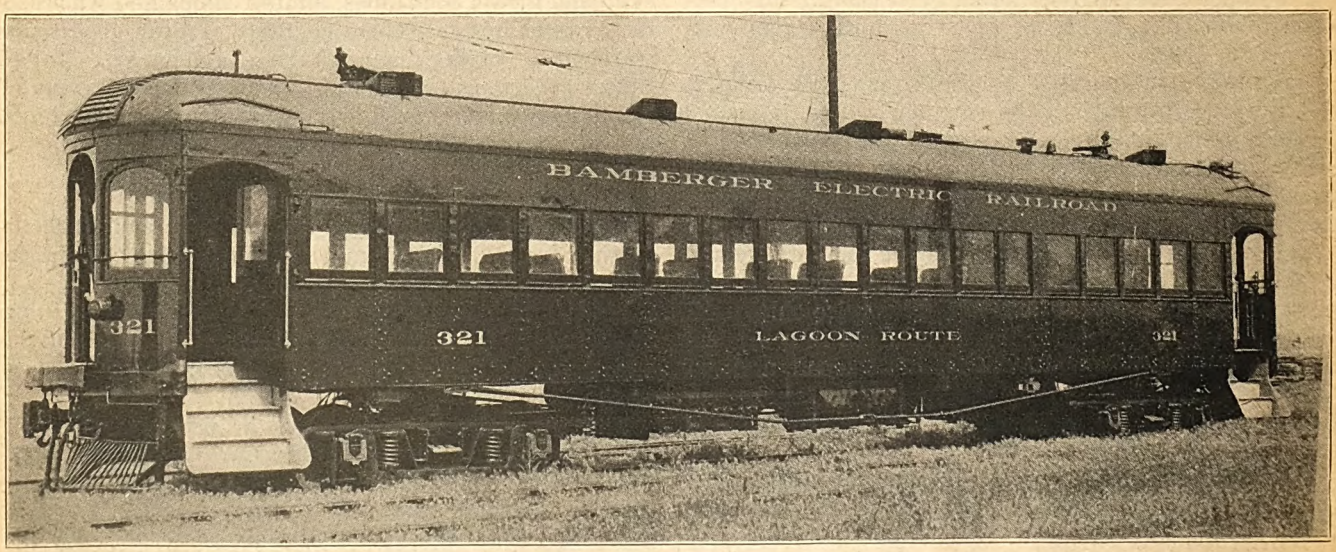
The road has a total track mileage of 74.37 miles,



MAP OF THE BAMBERGER ELECTRIC RAILROAD —THE LAGOON ROUTE—SHOWING HOW IT LIES BETWEEN THE MOUNTAINS AND THE GREAT SALT LAKE

the greater part of the distance between Salt Lake and Ogden being double-tracked. The larger portion of the track is laid with 75 and 85-lb. rails. Except for two blocks, International steel ties are used in all pavement, with monolithic concrete construction. The overhead construction is of cross-span type, well braced. In addition to two No. 0000 trolleys, the 750,000-circ.mil copper feeder cable extends the entire length of the line. There are two telephone circuits, one consisting of No. 12 copper and the other of No. 10 iron. The single-track portions of the line are protected by block signals. Feeeder taps are located every 1,000 ft. and a Westinghouse pole-type lightning arrester is installed at each tap.

In 1914 an agreement was entered into with the Utah-Idaho Central Railroad, then the Ogden, Logan & Idaho Railroad, for the construction and operation of a joint passenger and freight depot in the heart of the city of Ogden, and in the same block in which the post office is



TYPE OF MOTOR CAR USED BY BAMBERGER ELECTRIC RAILROAD

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located. This not only serves to reduce the expense of operating the terminal, but develops considerable through business, both freight and passenger, between the interurban lines, as through service is operated through the joint terminal.

In 1914 an arrangement was entered into with the Salt Lake & Utah Railroad for the construction of a joint terminal operated by the Salt Lake Terminal Company at Salt Lake City, 50 per cent of the stock of said company being owned by each of the two interurban lines. The passenger terminal is in the heart of the city of Salt Lake, across the street from the Mormon Temple and Tabernacle, and only one block from the Hotel Utah and Main Street. The Salt Lake Terminal trackage is likewise ideally located for extensive warehouse and industrial development, its trackage being much closer to the business center than either of the competing steam lines; and many valuable industries are being located on this trackage.

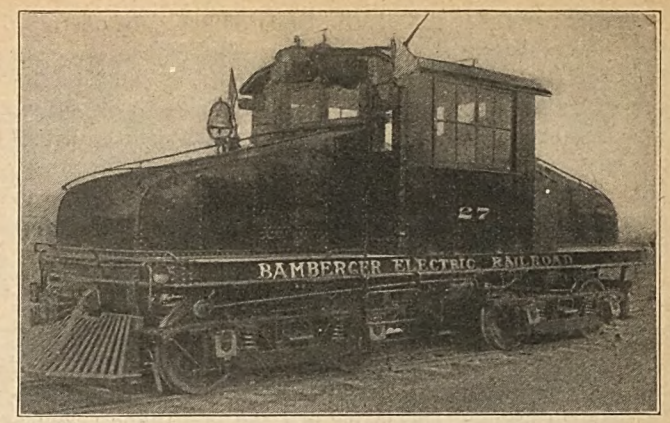
In addition to the terminal stations at Salt Lake City and Ogden, depots are maintained at the following stations: North Salt Lake, Bountiful, Centerville, Farmington, Lagoon, Kaysville, Layton, Clearfield, Arsenal.

A well-equipped machine and blacksmith shop and paint and carpenter shops are located at North Salt Lake, and carhouses at Salt Lake and Ogden.

One of the factors which helps maintain the high standard of service is the cleaning and inspecting service. All cars and equipment are inspected at each end of each run, at both Salt Lake City and Ogden. Furthermore, the cars are cleaned, given a sort of "Pullman service" at the same time.

Electric power for the operation of the road and its various other uses is furnished by the Utah Power & Light Company. Substations are located at Ogden, Clearfield, Farmington and North Salt Lake, those at Ogden, Farmington and North Salt Lake being equipped with two 400-kw. G.E. motor-generator sets, and the one at Clearfield having one motor-generator set of the above capacity. These machines are very substantially built, and are capable of sustaining heavy overloads. They are direct-connected, 600-hp., 2,300-volt induction motor to 400-kw. generator, delivering 750 volts direct current.

At Lagoon, a station about 18 miles north of Salt Lake City, is located the famous Lagoon resort. This is a beautiful summer resort and entertains thousands



TYPE OF ELECTRIC LOCOMOTIVE USED BY BAMBERGER ELECTRIC RAILROAD

of pleasure seekers during the summer months. Here the seeker of recreation can indulge in swimming, boating, fishing, dancing and various other sports amid surroundings noted for their natural beauty. This resort is served exclusively by the Bamberger Electric Railroad, and during the summer months the company publishes an excursion rate from all points on its line to the resort. It is owned by the railroad company, and consists of a 40-acre park, 9 acres of which is lake for boating and bathing.

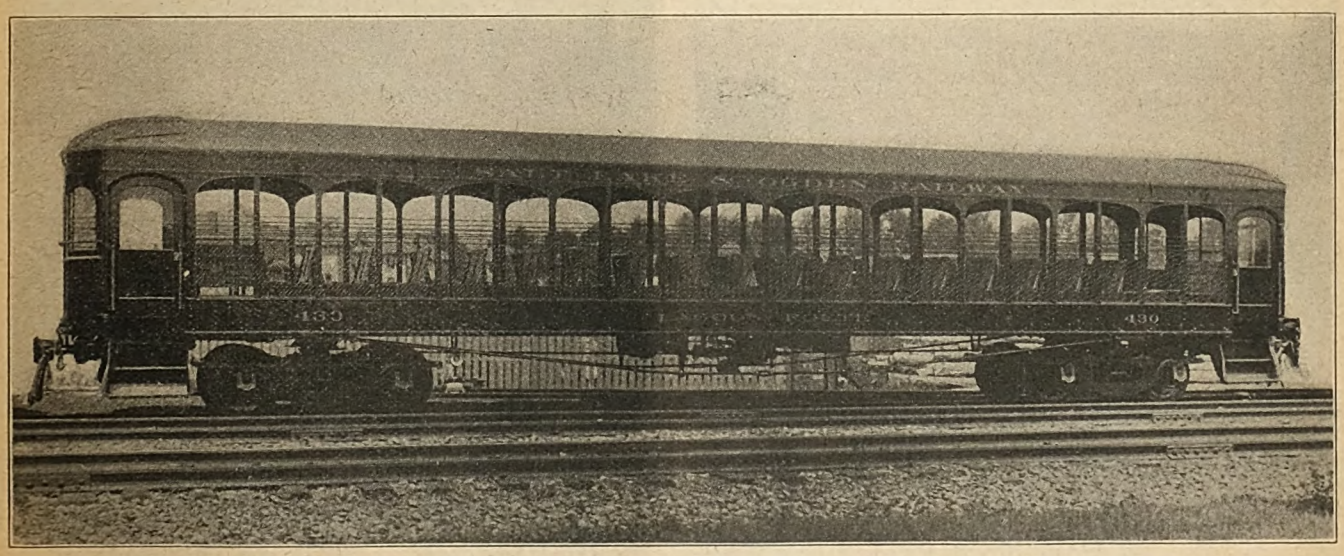
ROUTING AND SCHEDULES AND OPERATING ORGANIZATION

The publicity and traffic departments are operated jointly and under the jurisdiction of the general manager. In this department are the traffic manager, soliciting agent and chief clerk.

The operating officials are as follows: Simon Bamberger, chairman of board of directors; Julian M. Bamberger, president and general manager; J. B. Bean, vice-president; E. A. Vail, secretary; W. E. Jones, auditor; R. B. Needham, traffic manager; N. S. Wiltsie, general superintendent.

The method of securing traffic, both passenger and freight, is chiefly by personal solicitation. In connection with the publicity and traffic departments considerable literature is published, such as time-tables, freight schedules, calendars, car cards, etc.

An hourly schedule is maintained between Salt Lake City and Ogden.



TYPE OF OPEN EXCURSION CAR USED BY BAMBERGER ELECTRIC RAILROAD

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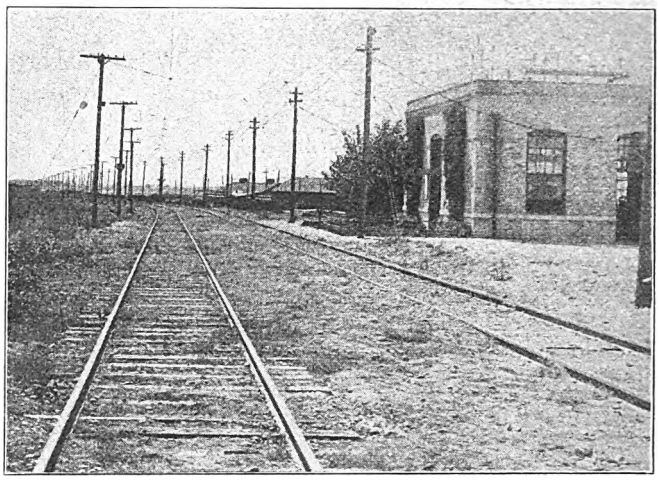
Passenger rates are on the basis of 2¾ cents per mile for the one-way fare, and 180 per cent of the one-way fare for the round trip. The steam lines' rates in the same territory are 3.6 cents per mile in each direction. The Bamberger Electric Railroad handles practically 95 per cent of the passenger business local to its territory, also this proportion of passenger business between points on its system and points on the Utah-Idaho Central Railroad to and including Preston, Idaho.

An interesting feature in connection with the business of the road is the effect upon traffic by the business activities of the Mormon Church. The headquarters of this religious organization are at Salt Lake City. It has, however, branch organizations and business institutions throughout the states of Utah and Idaho. Twice each year there is held what is known as the General Conference, during which time the members of the Mormon Church, or a large percentage of them, from all sections assemble at Salt Lake City to discuss their church affairs and other matters. The location of the Bamberger road, the territory through which it runs, and its connection with the Utah-Idaho Central Railroad at Ogden enable it to handle the greater portion of this conference travel, which is quite an important factor.

The Bamberger Electric has made no change in its regular basis of passenger fares for a number of years. Under date of Oct. 18, 1918, an application was filed with the Public Utilities Commission for increase in such fares to the basis of the competing steam lines; and after a hearing, a decision was rendered denying such application. Permission was then asked to cancel the company's excursion rates in its tariff and advance student fares from 1 cent to 1½ cents per mile. The commission's decision on this matter, dated May 10, 1921, allowed the road to cancel its excursion rates and to increase student fares from 1 to 1.1 cent per mile.

Freight rates in each instance are identical with the competing steam lines. As previously stated, the Bamberger road is a party to through tariffs with several of the steam roads, but not with others, and the absence of such an arrangement with some of the steam roads is considerable of a handicap. It does, however, handle



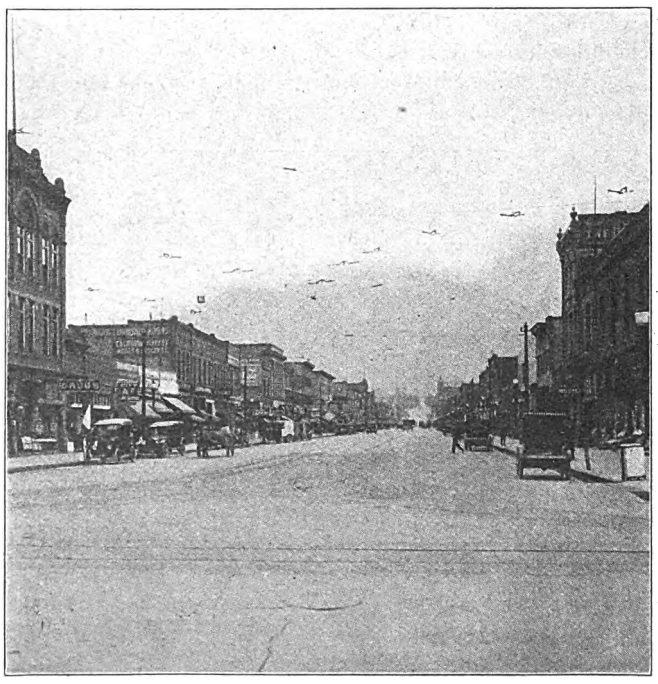
VIEW SHOWING PORTION OF TRACK—SHOWING ALSO OVERHEAD CONSTRUCTION AND SUBSTATION

90 per cent of the business to industries located on its tracks where through rates are in existence.

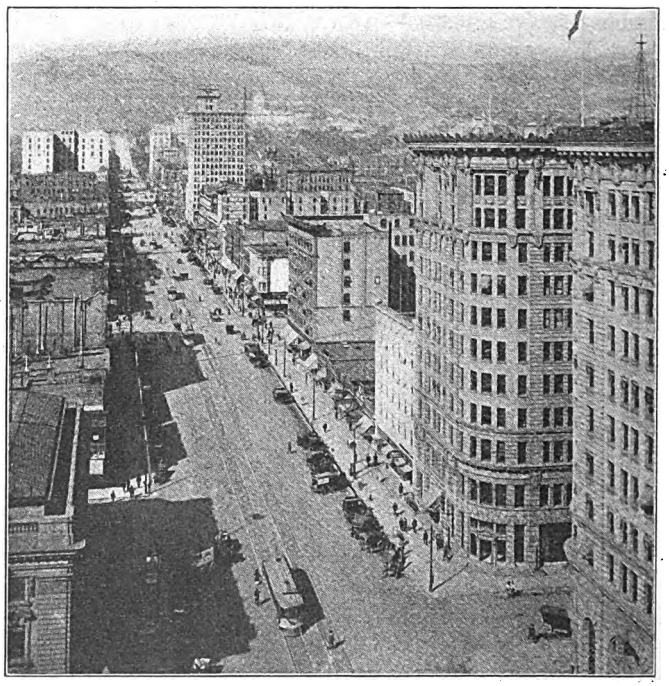
The express business handled over this line is contracted by the American Railway Express Company, the Bamberger Electric handling practically 90 per cent of the local express business within its territory; the company also receives 20 per cent of the transcontinental express business in and out of its territory.

Motor trucks are becoming quite a factor as a competitor in short-haul traffic, due to the fact that a concrete road parallels the line for its entire length, but it is felt this situation will never become serious.

The operation of the Bamberger Electric Railroad furnishes a splendid example of efficiency and courtesy, and the policy of the management of giving to the public every consideration in connection with its excellent service has produced wonderful results. The development of its business has been steady and substantial, in spite of the many drawbacks and the opposition encountered in its earlier days. The road is a most important factor in the bringing together of the people and the business interests of Salt Lake City and Ogden and the building up of the intervening territory.



VIEW OF TWENTY-FIFTH STREET, SHOWING PART OF THE BUSINESS SECTION OF OGDEN, UTAH



MAIN STREET, SALT LAKE CITY, THE SOUTHERN TERMINUS OF THE RAILROAD

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Social Insurance and Transportation Companies

Public Relations Are Bettered by Contented Employees—Co-operation the Keynote in Social Insurance—Types and Methods in Use by Electric Railways Discussed

HUMAN relationship in the utility industry is getting the attention of the executives as never before. The good will of the employees is an asset to the street railways, whose financial success is determined by their popularity with the public. The employee, in the final analysis, represents the company to the public and secures the good or ill will of the patrons.

Any means that will relieve the employee from worry about himself or his family should be considered with interest, because such a condition will make an employee good humored, polite to the public and interested in the company affairs and will result in a minimum labor turnover. A group of polite, experienced and contented employees, therefore, is an asset to the street railway to a degree found in few other industries because of the intimate relations existing between the employees and the patrons.

There are several things that jeopardize the morale of employees, for they realize that accidents may occur in connection with their work, sickness may occur at any time and stop their incomes, death may occur and families suffer privations, old age is always looming up with its potentialities for financial troubles and unemployment may occur due to discontinuance of some lines, jitney competition, strikes or lack of riders. Any street railway employee given to personal worry from any cause is in poor condition to be an apostle to the public or to preach and live the gospel of good will to all men.

What methods are used or available to meet this situation? Insurance education and co-operation are available—insurance to relieve the employee from financial worries, education to aid the employee intelligently to represent the company and co-operation to cement the interest of the employer and the employee in the street railway business.

Social Insurance Should Be Co-operative

Heads of electric railway companies are turning their attention to the science of human relations in their industry. The formation of co-operative associations, the purchase of group accident and health and of group life insurance, the publication of a company paper and the institution of company educational courses—all these are encountered frequently and their value is recognized. A complete plan dealing with human relations will use all available methods in a co-ordinated manner.

Insurance to care for the financial hazards to employees is a variable and new business and is handled in many ways by the individual properties. On a purchase basis there are but two methods available to obtain or carry social insurance:

1. Old line insurance.
2. Self-insurance.

Self-insurance may involve a rather complicated system. An individual property may carry all or part of its own insurance, it may be associated with a group of similar properties in a mutual insurance organization or it may carry its own insurance with reinsurance with old line companies through a holding company. On one property, insurance of several types may exist, and the size of the property or the type of hazard also affects the choice of policies.

No standardized treatment of social insurance can be used or should be used, because every railway company has a distinct personnel and peculiar operating conditions. However, there are some fundamental ideas that are pertinent:

1. Social insurance must be "sold" to the employees to function to advantage.
2. Supervision and education are essential to maintain the efficiency of the insurance.
3. Best results from social insurance are obtained when the employees feel they are morally or financially concerned in the insurance. In some cases part payment of premiums by the employees works well, but in other cases insurance has been very successful without financial participation in the premium payments. The specific property with its labor, social and other conditions dictates the methods to be used.

The ideal way to institute social insurance is to make a detailed study of the street railway organization, to determine its financial and operating status, to get the ideas and reactions of the employees and then to call into consultation the heads of the various departments. After explaining the situation and, if possible, getting constructive suggestions from the department heads the types of insurance suitable to the organization and the agency for putting them into effect can be decided upon.

These same department heads, as a result of these conferences, go out among the men and become insurance salesmen to the men and their families. Every employee should be permeated with an understanding of the proposed insurance—why it is carried, how much it costs, who pays for it, and how it will benefit him.

In some cases, due to time elements or labor conditions, the insurance is purchased by the employer and then "sold" to the employees. The fact that some of the employees actually have the policies is a convincing argument to others. After the insurance is placed in effect it must be operated, supervised and changed to conform to changes in the operating conditions or personnel. Educational work, safety first work, athletics, etc., are essential elements in the game if complete success is desired.

Accident and Health Insurance

Group accident and health insurance is divided into two general classes:

1. Insurance fixed by workmen's compensation laws covering accidents while at work.
2. Insurance covering accidents and illness under all other conditions.

Insurance to cover the requirements of the state compensation laws is very complex because each state has clauses in its law peculiar to its own conditions and industries. Nearly every law is based on the old English clause "Personal injury by accident arising out of and in the course of employment," but many of the laws change or leave out certain of the words, and the courts in all states have not clearly defined the mean-

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ings of a phrase like "Occupational Disease" or words like "Accidents" or "Injuries." The amount of compensation also differs and the elapsed time before compensation begins. Some of the laws even class some types of illness as "accidents" and provide compensation.

In certain states the insurance must be carried in a state fund. In other states the insurance can be carried by the railway company, provided it furnishes a bond, while in still other states it can be carried in a mutual, old line or state insurance organization. The law must be complied with at all events, and how much compensation should be given in excess of the legal requirements is a subject for each company to work out for itself.

Group health and accident insurance other than state law requirements is designed to cover liabilities for injury at all times and to provide a sickness benefit. In general a policy provides for a waiting period and only a portion of the regular wages is paid the worker. On an average the workers of the country lose eleven days a year on account of illness. Health campaigns, infirmaries, medical departments and physical examinations help to reduce this period.

There are two methods for handling this insurance:

1. Old line insurance company. Employer pays all or a portion of the premium depending on conditions.
2. Self-insurance. This may take the form of a contingent fund, a mutual organization or an employee benefit association.

Many of the large old line companies will not place policies today if the employees pay all the premiums. It is usual to have the employees pay about 40 per cent and the employer 60 per cent. This plan is followed because the insurance company desires to deal with a responsible party and many employee associations are very unstable. Or again the employees may not get 75 per cent of their number to insure, which is the usual requirement for a master policy.

The rate for policies is fixed only by the occupational hazard and the percentage of females or colored when the policy is made on the basis of each $10 of weekly benefit. If the policy is made on the basis of payroll payments, the yearly charge is determined for each $100 of weekly payroll in the same manner as before with adjustments that consider the fluctuation in the number employed and the waiting period established before indemnity begins. The number insured and the age do not affect the rate and there is no medical examination. In these days of fluctuating wages the flat indemnity policy has worked out best.

The master policy that is issued considers the different classes insured and contains technical details. Classes may be numerous, but it is considered best to make the number a minimum. For example, on street railways:

Class 1—Supervisory force.

Class 2—Crews and shopmen.

Class 3—Section hands and track laborers.

Often one class, for example Class 3 in the example taken, may be omitted to advantage from the policy because the labor is unskilled, the administration of the insurance is expensive, or difficult, or for other reasons that apply to the specific property. It must be kept in mind, however, that insurance reduces labor turnover and unskilled labor is usually the first to leave in an unstable labor market.

An individual certificate is issued each man insured which guarantees the employee the benefits given him under the master policy. This certificate is issued by the insurance company, but is not a policy. It seems advantageous for the company to issue the certificates in its name, then the talk and gossip about how quickly claims are met refers to the employer and not to the insurance company.

A typical policy would have clauses as follows: Coverage for twenty-six weeks or longer, providing indemnity for all injuries not included under workmen's compensation act and for all sickness at a definite figure of say $10 per week indemnity after a period of eight days or for a definite percentage of the payroll, say a maximum of 66 per cent. The employer settles all claims through his own claims organization, subject to general consultation with the insurance company. The cost of such a policy, based on two-thirds compensation for twenty-six weeks, will vary from one to one and one-half per cent of the payroll.

GROUP LIFE INSURANCE

Group life insurance in its simplest form is life insurance issued to an employer for his employees. An executive must have fifty or more workers on his staff before he is eligible for this form of insurance from an old line company. Many of the old line companies co-operate on a joint agreement basis and will take a policy on twenty-five employees at a slightly increased rate, and a certain type of insurance known as "Employees' Insurance" is now available for employers who have more than ten employees. Group life requires no medical examination, fixes no limitation on age, does not consider sex, but does consider color. It specifies that an employee must serve a probationary period before he is entitled to take out insurance. Policies are written on three plans:

1. Flat sum per employee, say $1,000 with a probationary period.
2. A sum based on a year's salary or a percentage of their wage with a probationary period.
3. A sum that varies with length of service.

In general the best plan is that which fixes a sum based on length of service because this method encourages stability and so tends to bring bigger returns on a group life investment.

The smallest amount for which workers are insured is $500 and the largest $5,000, the cost being met by the employer, or by a co-operative plan. If the premium is paid by both, some laws require that 75 per cent of the eligible employees must accept the insurance. As long as the employee continues with the railway company, the insurance remains in force, and he may convert at his own expense to a standard contract without medical examination if he leaves the company.

A clause in a typical policy provides for disability benefits. In case an employee becomes totally and permanently disabled before reaching the age of sixty, he will receive the full amount of his insurance according to one of several plans which he may choose. If death should occur during this period, the remaining installments will be paid to his beneficiary.

The employee names his beneficiary just as he would under an ordinary policy and has the privilege of changing his nominee from time to time as circumstances demand. Under no conditions can the employer be named as the beneficiary.

Group life insurance is sold at rates less than individual life insurance rates because it does not require the expense of medical examination and also eliminates

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clerical work and overhead charges. A master policy is issued the employer and individual certificates to each employee insured.

The employee likes a full check, the company likes to have every man on duty every day and the insurance company wants a low death rate and also is in a competitive business so that health service and safety first service is a logical and valuable development in group life insurance from the standpoint of the employer, the employee and the insurance company. Free literature and health advice are offered to the policy holders and aid is given to institute and operate the policy efficiently. The cost of group life policies is based on the occupational hazard, the indemnity plan and the weighted age of the employees. It will vary between $8 and $12 per $1,000 indemnity.

The master policy covers the desired classes of employees and eliminates employees not eligible because of the probationary period. The individual premium for each individual at his age and for the amount of indemnity is considered and the sum total of premiums and the sum total of insurance are then determined. These data give the average cost per $1,000 of insurance for that class of employees. Then during the policy year all additional insured are figured on the basis of this average cost.

For the next policy year the process is repeated so that each employee pays a slightly higher rate due to his increase in age, since the group policy is renewable each year at the attained age of the employees. With normal turnovers, however, the premiums remain stationary at the end of about five years. The probationary period is usually placed at three months to ward off "floaters."

Electric railway companies have not neglected group life insurance and the following companies are among those that have bought such insurance: Philadelphia Rapid Transit Company of Philadelphia, International Railway of Buffalo, Knoxville Railway & Light Company, Washington & Old Dominion Railway, Hudson Valley Railway, United Traction Company of Albany, Arkansas Valley Interurban Railway of Wichita, Chattanooga Traction Company, Kingsport Utilities, Inc., Laurel Light & Railway, Lincoln Traction Company, Nashville Railway & Light Company, the Duluth Street Railway and the Denver Tramway.

The primary advantage of group life insurance to the employer is that it furnishes an incentive to the employee to remain with the one organization for a long period and gives the employees self-respect and confidence in the future. It eliminates "passing the hat" after accidents, improves morale and permits older employees to get insurance.

Benefit Associations and Life Insurance

Old age pensions, some types of sickness and health benefits and other special welfare activities are taken care of best by means of a co-operative association of employees and the employer. It is true, a company can give life insurance or pensions to its employees, but such a practice is faulty and not customary.

A recent and very interesting development for considering all social insurance is the so-called benefit association. Its operation can be shown best by examples. The United Gas Improvement Company employees formed an association in 1920. Any employee who had been an employee of the company for one month is eligible for membership. The applicant authorizes the auditor of the company to deduct $2 per month from his payroll and to pay it to the treasurer of the association.

In November, 1920, a group life insurance contract was arranged with an insurance company whereby any association member can, upon application, secure a $1,000 life insurance policy with conversion clauses. For this insurance the association charges all policy holders up to thirty-nine years of age ninety cents per month; forty to fifty years of age, $1.25 per month, and increases the charges with a still greater age.

In February, 1921, the association took out a group disability policy with another insurance company whereby, for a base rate of 50 cents a month, applicants can secure benefits of $1 a day covering the first seven days. Additional coverage up to $6 per day may be secured at the base rate per dollar, but if limited to 66 per cent of the wages of the applicant. This insurance is also convertible if the employee leaves the company.

The premium charges for the insurance are deducted from the monthly dues paid by each member of the association and 5 per cent interest is paid on all money in the association savings fund. The three branches of the association in 1921 had members as follows:

Savings fund 1922, life insurance 1,347, disability insurance 675.

The affairs of the association are managed by a board of trustees consisting of the president, vice-president and treasurer of the association and six other members. The expenses for operating the association have been assumed by the United Gas Improvement Company, but the insurance cost is assumed entirely by the members.

On the Philadelphia Rapid Transit lines all employees who have been with the railway company for one year are eligible to membership in a benefit association. Each employee pays $1 per month for dues into the association treasury, and the Philadelphia Rapid Transit Company pays $10,000 per month into the association treasury. Aside from other features, this plan provides for sick, pension and life benefits. One dollar and a half per day is paid in the event of sickness, commencing on the eighth day and continuing for a period not to exceed 100 days in any year. This benefit is in addition to that which is required under the workmen's compensation law.

On the Philadelphia Rapid Transit Company system pensions are given to employees sixty years of age. with a fixed sum of $40 per month for each employee who has been with the company continuously twenty-five years. Life insurance provides that $1,000 be paid in the event of death of any employee, with a provision that if the employee insured, before he is sixty years, should become permanently disabled by accidental injury or disease further payments will not be required and the employee will receive instead, for each $1,000 insurance, either sixty monthly installments of $18, or twenty annual installments of $67.98, or fifteen annual installments of $83.90, or ten annual installments of $214. If the insured dies during the period of disability the remaining installments are paid to the beneficiary as they become due. A further clause in this type of policy is a conversion clause which permits the employee to carry insurance after he leaves the service of the railway company.

The Denver "Brotherhood" is very similar to that of the Philadelphia "Benefit Association" and provides that each member shall pay monthly dues. For insurance against sickness, injury or disability the dues are

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$1 per month for members who earn $80 or more, 75 cents per month for those earning between $60 and $80, and 50 cents per month for those earning less than $60 per month.

These dues entitle members to benefits of $10, $7.50, and $5 per week respectively, for the three classes, for 104 weeks as a rule, but unlimited for employees who have been ten years with the company. The benefit begins immediately if the illness lasts fourteen days, otherwise it begins seven days after disability. Death benefits are $1,000, $750, and $500 respectively for the three classes, and are paid for and carried by the railway company for the benefit of its employees.

The Duluth Street Railway gives free life insurance to all employees who have been with the company for one year. The amount of the policy is equal to one year's salary, and is a minimum of $1,000. The Third Avenue Railway Benefit Association, New York City, gives an indemnity of $1,000 per employee in the event of death. In Galveston the benefit association of the street railway company pays $1,000 in the event of death. In case of accidents or illness the benefit association pays $2 per day after the fifth day for a period of 120 days, and then $1 per day for the next sixty days, with $300 as the maximum benefit.

Pension Bonds

Pension bonds are issued by old line insurance companies to care for employees. These bonds take mortality experience into account in fixing the rate and there is no return in the event of death prior to the age of sixty-five. The cost of the bonds may be met by the employer or in co-operation with the employees. One form of bond provides a guaranteed pension for ten years, beginning at the age of sixty-five, if the bondholder lives to that age and the payment of a pension thereafter as long as he lives. If the bondholder dies before reaching the age of sixty-five the moneys that have been paid for the bond will be returned, without interest, to his beneficiary.

For example, if the bond is $100, at the age of twenty-eight the cost would be $262.80, and if the holder lives until he is sixty-five he would be guaranteed $1,000 in $100 yearly installments for ten years and if death occurs during this period the beneficiary gets the remaining installments. At seventy-five and thereafter until death the $100 yearly payments are made to the original bondholder, but the beneficiary gets no money in case he dies.

The bonds may be for $10, $20, etc., a year, or at a certain percentage of an employee's salary, or after a certain probationary period has been served. The pension will depend, therefore, on the bonds accumulated and the cost of one bond has no relation to the bonds accumulated and the cost of one bond has no relation to the cost of another bond subsequently purchased.

In the railway industry the latest data indicate that about thirty companies have old age pension schemes, while 125 companies have some form of benefit association which pays sickness, accident and death benefits.

Pension bonds are a new development and some firms are inclined to invest the money set aside for this purpose in their own preferred stock or bonds; for example, in the case quoted, $262.80 invested at 6 per cent compound interest for a period of thirty-seven years would amount to about $2,200, and this seems to be a better proposition than the $1,000 available through the straight pension bond.

The labor turnover is not a proper basis for setting aside a fund to meet the liability of the pensioners as they retire; the only safe way is to set aside a sum each year which is sufficient to meet the liabilities.

Another questionable policy is the requirement that an employee remain twenty-five years continuously with the company before he is entitled to a pension. Some companies find it better for the employee and themselves to contribute to a pension fund for ten years, after which the fund may be left to accumulate or may be withdrawn without any penalty to the pensioner. This scheme is based on the argument that an employee who has been ten years with the company will be more loyal and efficient if he continues to work of his own free will rather than being held to his job by the penalty of losing part of his pension if he left.

Conclusions

Group insurance should be made something over and above the financial cost or recompense in the mind of the worker. It is good business to develop in the worker a personal interest in the railway business, and welfare or educational work that does not imply some effort or sacrifice on the part of the worker is seldom worth while. It should be part of a carefully planned human relations program and should be on a contributory basis to obtain maximum benefit.

As a concrete practical thing in the mind of the worker, a visible asset to the railway employer and a nucleus to weld together the whole organization, social insurance is worth while. Publicity and knowledge of details are the secrets of its success with the worker and with the public and every claim settled should be made a cause for publicity in the railway house organ.

The types of social insurance suited to each railway company must be determined by a study of the specific community and company. This study involves not only a knowledge of insurance but also an intimate knowledge of the specific property.

Ninety-seven Autos and Trucks in Atlanta Fleet

NINETY-SEVEN automobiles and trucks are required in the transportation and patrol service of the Georgia Railway & Power Company, Atlanta, Ga., to meet the demands made upon these two departments for quick action.

These cars range all the way in size and capacity from small Ford roadsters to 5-ton trucks. They are used in transporting materials from one installation to another, from one shop to another, from shop to installation, and from warehouse to shop. They are also used in patrolling the power lines of the company which radiate from the dams at Tallulah Falls and Bull Sluice to many sections and which require constant care and attention to keep them functioning properly.

Some of these trucks are especially equipped for emergency service, such as wrecks and fires, and can go at a moment's notice to pick up or cut wires that endanger the public safety.

Sixteen men are constantly employed to keep these cars in running order and repair.

In the course of a year these cars cover approximately 96,000 miles. They consume about 250 gal. of gasoline per day. Two huge gasoline tanks of 8,000-gal. capacity each have just been installed to assure a sufficient supply of gasoline at all times.

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Trackless Transportation Versus Rail Transportation

Each System Has Definite Advantages and Disadvantages—These Are Listed for Trolley, Auto Bus and Trackless Trolley, and Definite Conclusions Are Drawn as to the Field for Which Each Type of Vehicle Is Most Suitable

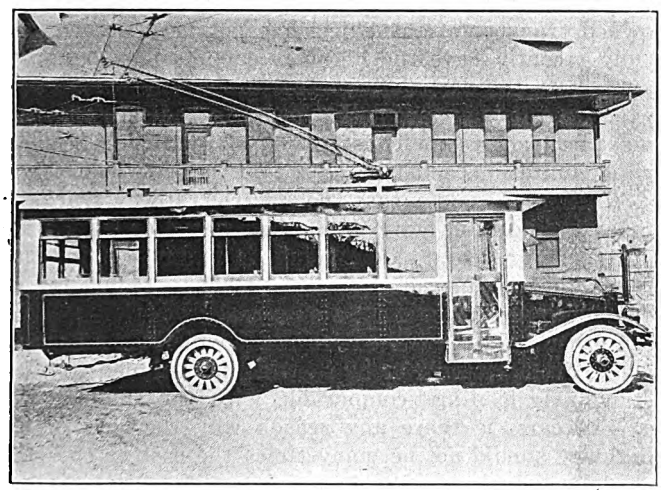
BY KARL A. SIMMON
Manager Light Traction Division, Westinghouse Electric & Manufacturing Company

THE auto bus and the auto truck have demonstrated, beyond all doubt, that there is a definite field of usefulness for this form of motive power that no other tool or instrument of transportation now known to the art can equal. The problem confronting the engineering and transportation branches of the electric railway industry is largely that of determining, from a practical operating and engineering viewpoint, what is the economical field of operation for the electric railway, the trackless trolley bus and the auto bus.

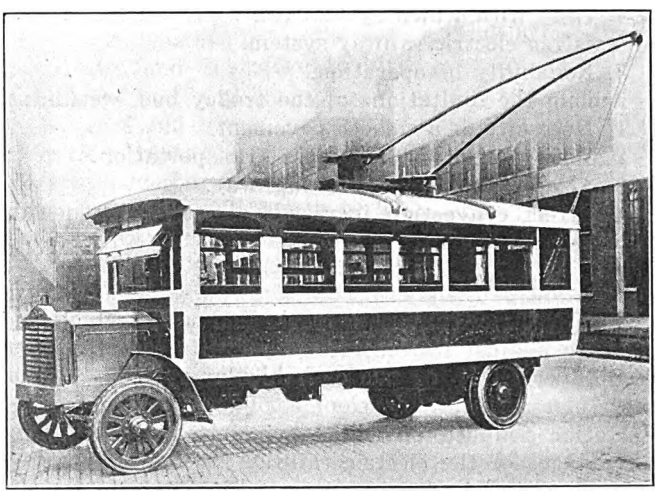
There are so many important factors involved in this problem that only the high spots may be touched upon in a single article. The principal economic consideration is, what is the best form of transportation for a given community when all factors are given due consideration, such as ultimate cost to the community, including taxes, community development and prosperity? If we assume the community had to pay for all tracks and pavements, cars and power plants (which it really does in one form or other) and take into consideration the use of tracks for distribution of freight as well as passengers, which form of transportation would prove most economical for general use? I am quite sure the answer would be for the average city about 85 per cent would be the electric railway, about 5 per cent the trolley bus and 10 per cent the auto bus.

In some cities the electric railway would justify a higher percentage; in others less.

Next consider the factors that determine the economic use of the "electric railway, track and all," the trolley bus and the auto bus—for simplification leaving out the freight distribution problem.



TROLLEY BUS WITH PACKARD AUTOMOBILE CHASSIS, KUHLMAN BODY AND WESTINGHOUSE MOTORS AND FOOT CONTROL



TYPICAL TROLLEY BUS BUILT BY THE ST. LOUIS CAR COMPANY AND EQUIPPED WITH WESTINGHOUSE MOTORS AND FOOT CONTROL

ADVANTAGES AND DISADVANTAGES OF BUS

First, what are the present limitations and advantages of the auto bus? This method of transportation in one form or other has been in use quite a few years, both in this country and abroad. Three principal developments have made the auto bus possible, namely, the development of the internal combustion engine, the development of smooth pavements and the rubber tire, I might even say the pneumatic tire. Before smooth pavements came into general use we had the horse car. The fundamental reason of the track when horse-drawn cars were used was to provide a smooth, easy running, economical surface for the car. When electric railways came in, the track filled another function—that of providing a return circuit for the electric power.

Hence it is obvious that the auto bus would not today be much of a factor in community transportation were it not for the general development and use of smooth pavements; in other words, smooth pavements are essential for bus transportation. It is also obvious that as soon as auto bus transportation comes into general use communities will impose on transportation companies taxes covering the proportional upkeep of the highways; also, that as time unravels, analytical studies will disclose whether a track laid in smooth pavements as a means of carrying larger concentrated loads is more economical than the smooth pavement capable of carrying heavy loads over its entire width. But assuming that smooth pavements exist, the important advantages of the auto bus for handling transportation are:

1. Cost of power plant, track or roadway and overhead trolley are eliminated; *i.e.*, smooth roadway is furnished by the people.

2. Greater freedom of mobility. They may operate anywhere pavements permit; *i.e.*, routes are not fixed, may be withdrawn if traffic changes, are not materially interfered with in case of blockade at some place, as they may run around obstructions.

3. Ability to supply service economically to undeveloped communities.

Some limitations of the auto bus are:

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1. Necessity of smooth pavement.
2. Wholly unsuited for mass transportation.
3. Size of unit limited by highway construction and manual work that can be imposed upon operator.
4. Street congestion increases directly as number of passengers carried.
5. Increased density of traffic does not permit of an appreciable decrease of unit operating cost.
6. Apparent decrease of fuel supply with little likelihood of greater efficiency of the internal combustion engine.

CONSIDERATION OF TRACKLESS TROLLEY

The fact that smooth pavements made the auto bus possible has also made the trackless trolley bus an important factor and one that has promise of more general use than seems to be appreciated. Its advantages are:

1. Cost of track or roadway eliminated; *i.e.*, roadway furnished, built and maintained by people.
2. Centralized efficient power generation.
3. Freedom of mobility compared to rail cars.
4. Ease with which system can be co-ordinated with an existing electric railway system.
5. Reliability of operation.

Among the limitations of the trolley bus, we find:

1. Necessity of a smooth pavement.
2. Wholly unsuited for mass transportation.
3. Size of unit limited by highway.
4. Street congestion increases directly with density of passenger traffic.

THE ELECTRIC RAILWAY, TRACK AND ALL

The electric railway, "track and all," which has charged against its income not only its own track but also 16 or 18 ft. of bus or vehicular roadway, is not merely an accidental development but a system of transportation founded on sound principles. Some of the advantages of the electric railway are:

1. Centralized efficient power generation.
2. Conservation of natural resources.
(a) Low fuel consumption.
(b) Long life of vehicles.
3. Economical use of labor.
4. Ability to meet rapidly increasing traffic density with increased efficiency.
5. Economy in handling mass transportation.
6. Reliability of operation in communities where severe winters are encountered.
7. Simplicity and flexibility of operation.
8. Low first cost per passenger.

The limitations of the electric railway may be listed as:

1. First cost of power house, track, transmission and overhead.
2. Cost of investment not justified where light traffic exists even though some service is justified.
3. Existing franchise taxes and other imposts, *i.e.*, paving, sprinkling and sweeping, now expected of electric railways and not imposed on the trolley bus or the auto bus.
4. The 5-cent fare or less is fixed in the people's minds, whereas they are willing to pay 10 cents or more for bus service. For instance, in New York considerable agitation prevails for a 5-cent street car fare and not a word of criticism is heard relative to the 10-cent fare which is charged on the Fifth Avenue bus line in the same city.

MOBILITY, PAVEMENTS AND CONGESTION

There is no question but that of the three forms of transportation the gas-driven vehicle is the most mobile, while the rail car is the most restricted. The mobility of the gas car makes this form of transportation most suitable for handling crowds at unusual points and permits of traffic studies, the development of new territory and economical handling of certain classes of "owl" service. These characteristics of the gas bus, or in fact any self-propelled vehicle, are of importance and must not be lost sight of when comparisons are made between this form of transportation and trolley bus transportation.

From a standpoint of being able to dodge traffic and draw up to the curb, the trolley bus is on a par with the gas bus, and while it has the additional advantage of being able to accelerate quickly, sight must not be lost of the handicap imposed by the use of overhead wires.

Taxation is one of the elements of bus operation that should logically be classed among the items that can be evaluated, but at the present time the true cost or correct taxation for the use of a public highway by a privately owned transportation vehicle has not been determined. Only recently have the highway commissions begun to appreciate the destructive effect of heavily loaded rear axles, and it is apparent that either a radical departure must be made in the construction of roads or else more rigid limitations must be placed on the axle load.

When we consider that the electric railway tracks of today are nothing more than a roadway 4 or 5 in. wide, designed for heavy axle loading, is it any wonder that rear axle bus or truck loads of 12,000 to 14,000 lb. are damaging the present type of street or highway? On the other hand, if the entire road, which may be anywhere from 16 to 40 or 50 ft. wide, is designed to withstand axle loadings comparable with the smaller type of rail cars, is there any reason why the cost of the highway should not be many times the cost of the steel roadway which is only 4 or 5 in. wide? It has been said that after a certain relatively light rear axle loading is exceeded the cost of the highway increases more or less as the square of the axle loadings. The present cost of highways (to say nothing of improved construction that may be necessary with vehicles weighing 16,000 to 18,000 lb.) certainly precludes the building of a surfaced road merely as a means of handling passenger transportation with buses. If more substantial highways are to be built in order to care for the heavy as well as the light forms of transportation, it is naturally only a matter of time until the heavy vehicles, which form only a relatively small percentage of the total use of the road, must be called upon to pay a large percentage of the constructional and up-keep costs.

Rail-less operation, whether accomplished through the agency of a storage battery, an overhead trolley or a prime mover (such as a steam or a gasoline engine), is bound to result in greater interference with the other forms of traffic on the street per passenger transported than the car which must follow a fixed pair of rails. It is true that buses, and in general self-propelled or horse-drawn vehicles, can dodge a certain amount of congestion. However, the very fact that the car on rails must follow a certain definite path and not dodge in and out between traffic results in its causing a minimum interference to vehicular traffic. Again, the larger the unit the less the amount of intersectional interference. This is, of course, most important where the

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density of traffic requires close headway during the rush hour, though it must be remembered in this connection that as the headway is decreased a condition is being encountered where buses are uneconomically operated and should give way to rail operation.

It is obvious that at the same schedule speed rail-less cars involve a greater accident liability than rail cars. The major portion of this liability is chargeable to the necessity of steering the vehicle. However, in addition the rail-less vehicle is continually being subjected to a certain risk imposed by other drivers of rail-less vehicles. Accidents of this description are probably more numerous with the bus than with the rail car, due to a certain respect paid to the rail car.

There is a certain indescribable something that seems to entice some to ride the bus merely because it is a bus. Possibly the railway industry's past sins or lack of merchandising its product is partially to blame; again, also, there seems to be a class which enjoys riding on a street which is void of rails, even though the bus with solid rubber tires may be a rougher riding vehicle than the rail car. A certain amount of upholstery seems to liken the sensation in some way to that of the pleasure vehicle. The bus renders a real convenience to the rider in stopping at the curb, although this service may be limited to summer operation in many localities. It should also be borne in mind that the bus service is subject to interruptions chargeable to climatic conditions.

There are certain characteristics in the construction of a bus which materially affect its reliability of operation as compared to the reliability of a rail car. In the case of a gasoline propelled bus for economy's sake there is but a single prime mover. Failure of this element puts the bus "out of commission." Accelerations and quite a percentage of the running involve the proper functioning of such auxiliaries as a magnet, a clutch and several sets of gears. The truck or chassis of the bus must be constructed so as to take care of irregularities of the roadway. This requires features of construction not included in rail cars. The steering of a bus necessitates an axle construction which is inherently inferior and more liable to give trouble than the solid axle of the rail car. The gas-driven vehicle also presents certain lubrication, ignition and valve mechanism problems not common to either the rail car or the trolley bus. From the standpoint of seat miles delivered, it is obvious that the rail car is the most reliable, with the trolley bus falling somewhere between the two—probably very close to the rail car, were it not for the handicap of the current-collecting device.

Complication of Mechanisms Compared

While it is not feasible to measure in dollars the advantage of an electric railway system adopting electric bus operation instead of gas bus operation, on account of the greater similarity of operation, there are certain advantages which must be weighed. In the first place the organization of the electric railway is well fitted to care for the overhead equipment and the propulsion equipment involved in trolley bus operation. The personnel of the shops and inspection department are well acquainted with the propulsion apparatus of the bus and need no special training, as is the case when gasoline buses are operated by an electric railway organization. The present trend of development indicates that there is going to be a material advantage in having certain parts of the trolley bus equipment interchangeable with the present accepted equipment now employed on electrically operated rail cars.

The operation of the rail car today is comparatively simple, taking for example the safety car. There is one handle or lever which controls the slowing and stopping of the car and the manipulation of the doors. The car has a high rate of acceleration or retardation, provides for graduated brake applications, yet permits of a very high rate of braking in case of emergency and provides for an interlocking of the doors, the brakes and the propelling power.

In the case of the gasoline bus of today, we are confronted with a foot service brake, a hand emergency brake, a gear shifting lever, a foot or hand operated throttle, possible necessity of ignition adjustment, a door operating lever and, in addition to all of these, a manually operated steering mechanism.

In the case of the trolley bus, we have a pedal for the control of the propulsion equipment, a foot operated service brake, a hand operated emergency brake, a door operating lever and a manually operated steering mechanism. The simplicity of control of the rail car is apparent. The trolley bus manipulation is more complicated, primarily due to the steering of the vehicle—the gas bus being the most difficult of the three to operate, and therefore requires a more extensive training of platform labor.

The good old street car, "track and all," presents inherent advantages not common to any form of bus operation whether of the electric or gas type. An electrically operated rail system permits of caring for light service with small single-truck cars, and then, as the density of traffic increases, permits of closer headway with better economy, following which double-truck cars, possibly of a one-man-two-man type, can be operated. Then successive economical steps of two or three car trains can be employed. A continued increase in the density of traffic cared for by any form of bus operation soon involves an uneconomical condition due to the inherent limitation in the size of the vehicle and the inefficient use of platform labor. As the density of traffic increases a certain point is reached, where, on account of the greater efficiency of the electrically propelled bus, its operation can be more advantageously expanded than gas bus transportation.

Comparison on a Financial Basis

Among the elements which can be equated with a reasonable degree of accuracy on a dollar value basis we find:

(a) First cost of vehicle.
(b) First cost of overhead and structures.
(c) Depreciation.
(d) Maintenance of running gear, propulsion equipment, and vehicle body.
(e) Maintenance of overhead and structures.
(f) Cost of fuel or power.
(g) Cost of conducting transportation.

In considering the first cost of the rail-less vehicle it has been the tendency to make estimates on the basis of a vehicle varying from $7,000 to $8,000—the vehicle to seat anywhere from twenty-eight to thirty passengers. The vehicle cost, and more particularly the chassis and motive power cost, can vary over quite a large range. For instance, in the case of a trolley bus one, two or four motors may be employed. There may be a direct drive, chain drive, chain and gear drive, a single motor direct drive without differential gearing,

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or a propeller shaft and differential drive. Up to the present the tendency has been to employ two railway motors connected in tandem driving a standard rear axle assembly through a propeller shaft. There is considerable virtue in this construction, employing the maximum amount of standard automotive parts which are manufactured quite economically on a quantity basis.

The capacity of the vehicle has a direct bearing on the first cost, and in the past there has been a great tendency to make direct comparisons between the gas bus or the trolley bus, seating twenty-eight to thirty people with standing room for fifteen or twenty more, and the single-end safety car which seats thirty-five people and provides standing room for about thirty additional passengers.

The bus, whether of the gas or the electric type, seems to fit in best as a feeder and for light traffic sections which do not warrant the laying of rails, and on this basis there is considerable doubt as to the most economical trolley bus capacity.

Cost of overhead and structures is pretty well known, especially as applied to the street railway industry. However, when it comes to the trolley bus, the overhead construction is of considerable importance. In the first place experience to date indicates the necessity of providing two contact wires for each direction of operation, especially if we start out on the premise that one-man operation is to be employed. Also, arrangements must be made so that the cars can be looped at the end of the line, whether by running around a square or by turning on a small loop, so that a single operator can turn the vehicle around without leaving the operating position.

THE TROLLEY BUS AND ITS COST OF OPERATION

As a rule the logical trolley bus applications are somewhat remote from an existing carhouse, and some auxiliary method must be provided for operating trolley buses over the rail route to the carhouse. Where a grooved rail is used, it may be advisable to operate a rail shoe on the trolley bus as a means of taking it to and from its operating zone. However, in many instances it may be necessary to install a second overhead contact wire, normally at 600 volts potential, with an automatic means for transferring this wire to ground potential when the trolley bus is operating in the rail car zone.

The use of a double overhead contact system between the carhouse and the trolley bus zone may also be necessary to accommodate the use of a single pole current collector. Much development work has been done both in this country and abroad in connection with current collection devices, and while it is feasible to operate satisfactorily with two separate standard trolley bases, long poles and swivel harps, a single pole collector has certain desirable points in its favor. Among these are reduction in weight, less liability of current collector damaging the overhead circuit and less liability of short circuits.

Depreciation of the various forms of vehicles now employed is pretty well established and if the trolley bus is assumed as having an economical life of from six to eight years, applications made on this basis will probably not depart far from the actual.

The maintenance of the vehicle as a whole, which involves three elements, *i.e.*, the maintenance of the chassis, maintenance of the propulsion equipment and the maintenance of the body, is something that should be carefully scrutinized and caution exercised to see that ample allowance is made. Chassis repairs and up-keep can logically be based on past automotive data. The propulsion equipment where more or less standard railway motors are employed should be less than the corresponding figures for rail cars, since the motor or motors may be spring-borne and not nearly so rigidly connected to the driving axle as they are when supported directly on the axle transmitting their torque through comparatively large rugged gears. The up-keep of the trolley bus or gas bus body should logically be considerably higher than the up-keep of a body of the same size operated on a rail car where a much smoother roadbed is encountered.

The tractive effort required to propel a rubber-tired bus varies over quite an appreciable range due to such variables as type and condition of road, type and condition of tires, weight per wheel, type of drive, etc. It is not uncommon for the tractive effort per ton required to propel a rubber-tired vehicle to be three or four times as great as that required to roll a rail car having steel wheels. However, it is reasonable to asssume that under average conditions with a good road available (and such is believed to be essential for trolley bus operation) the power consumption for a 10,000-lb. vehicle will at least be equal to the power consumption of the safety car, making the same schedule speed and weighing 16,000 to 17,000 lb.

In the Sept. 10, 1921, issue of the ELECTRIC RAILWAY JOURNAL there appeared a short article on trolley bus operation which included the following data compiled by the writer relative to cost of operation:

COST PER BUS MILE OF TROLLEY BUS

Cost of conducting transportation	7.3	cents
Cost of power	2.5	cents
Maintenance of vehicle	5.0	cents
Maintenance of way and structures	1.05	cents
General and miscellaneous expense	4.0	cents
Road tax	1.0	cent

The total operating and fixed costs per bus mile on a typical service involving a fifteen-minute headway with buses weighing approximately 10,000 lb. was stated to be 24 cents, and on the same basis of calculation the gas-propelled bus shows a total cost per mile of 33 cents.

Although these figures were made some little time ago, additional data indicate that the total operating cost for the economical field of the trolley bus operation very closely approximates former calculations.

The application of rail-less service by the electric railway not only warrants a detailed cost analysis but also the answering of such questions as:

1. How long will the free use of existing paved streets or highways be permitted?
2. How much will the price of gasoline and rubber tires increase in the next three to five years.
3. Will gas bus operation fit in with present rail operation from the standpoint of shop equipment and personnel?
4. Are two contact wires necessary for each direction of operation?
5. On the basis of equal economy of operation of the trolley bus and the gas bus, which type of transportation is best suited from the merchandising standpoint?

After all points involved are taken into consideration, it is quite clear to many that continued development and use of the electric railway, "track and all," is the best solution for our transportation problem, making such use of the trolley bus and auto buses as their limitations will economically permit.

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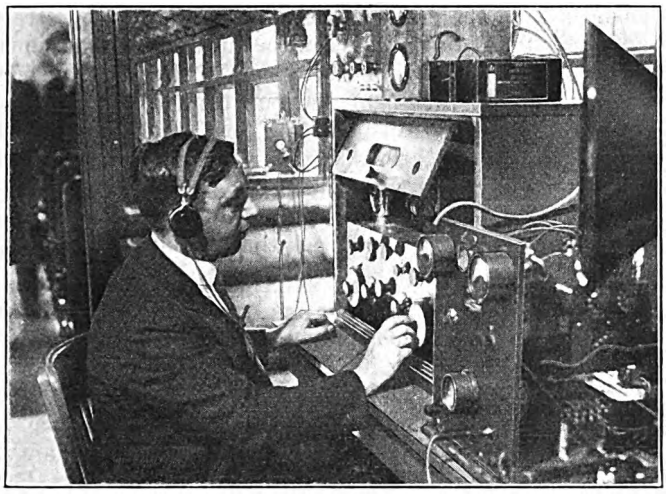

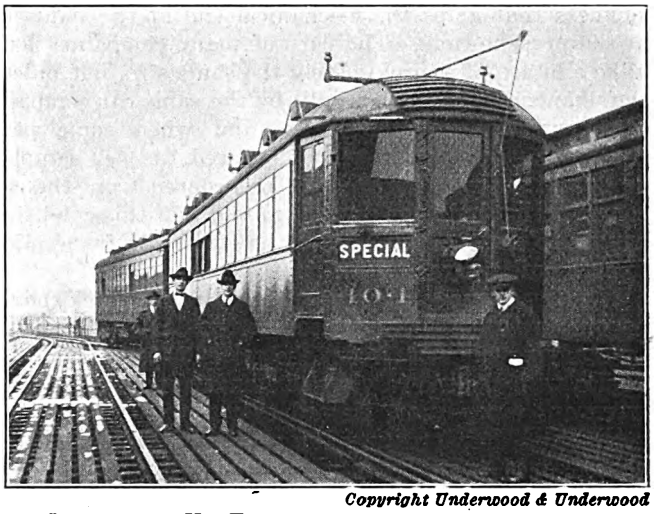

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AT LEFT, RADIO OPERATOR ON NORTH SHORE LINE TUNING HIS EQUIPMENT
AT RIGHT, TRAIN EXPERIMENTALLY EQUIPPED FOR RADIO SERVICE

North Shore Line Experiments with Radio Telephone

THE Chicago, North Shore & Milwaukee Railroad is conducting experiments with wireless telephone apparatus on one of its trains. The accompanying illustrations show how the apparatus appears as at present installed.

In the experimental work so far it has been possible to pick up grand opera at any point on the road and to transmit from the car by radio telephone up to but not exceeding 15 miles.

At present a new radio set is being designed and will be tried out shortly. There are technical difficulties involved in telephoning to and from a steel car, but these are in process of being overcome.

These experiments are in line with the consistent efforts of the management of the North Shore Road to make travel on its line interesting as well as speedy and safe.

One-Man Cars Have Lower Accident Record than Two-Man Cars

INTERESTING data are given in regard to the relative accident record of one-man and two-man cars in some figures compiled by Stone & Webster from the thirteen street railway companies under the management of that organization which operated both one- and two-man cars during the year 1921. It will be seen that the one-man cars are superior to the two-man cars as regards accidents from every viewpoint.

With regard to the eight companies under the Stone & Webster management omitted from the classification, four of these are entirely one-man operated, thus furnishing no comparative figures, and the other four have been prevented so far from installing one-man cars only by financial conditions. It is expected to inaugurate one-man car service with these some time during 1922.

COMPARISON OF ONE-MAN AND TWO-MAN CARS ON STONE & WEBSTER COMPANIES DURING 1921

Number of Companies—13*

	One-Man Cars	Two-Man Cars
Car miles operated	18,022,899	13,868,097
Passengers carried (including transfers)	95,198,971	98,952,902
Number of accidents:		
Total	6,852	7,981
Per 10,000 car miles	3.80	5.76
Per 100,000 passengers	7.70	8.11
Cost of accidents:		
Total	$235,140	$258,346
Per 100,000 car miles	1,304	1,863
Per 1,000,000 passengers	2,350	2,610
Accidents with important injuries:		
Total number	512	805
Number per 100,000 car miles	2.84	5.81
Number per 1,000,000 passengers	5.38	8.13
Accidents with trivial injuries:		
Total number	860	1,448
Number per 100,000 car miles	4.77	10.45
Number per 1,000,000 passengers	9.03	14.62

* Eight companies omitted because their operation, being entirely with one type of car, does not offer comparative figures.

Letters to the Editors

Standardize First the Parts that Wear Out!

PITTSBURGH RAILWAYS COMPANY
PITTSBURGH, PA., Feb. 8, 1922.

To the Editors:

I have read with much interest the discussion between our good friends Mr. Palmer and Mr. Gove regarding a slight change in a one-man type of car, namely, the adding of an exit door way.

In my estimation Mr. Palmer is right.

Most city cars of whatever type will operate in level territory at about 20 m.p.h., but so much time is lost in picking up and discharging passengers, in stops for safety and other delays, that the average car speed is above 9 or 10 m.p.h. in few large cities.

One-half the time, therefore, is lost because of these delays.

Street railway men ought to spend their efforts in eliminating as much of this lost time as possible.

Mr. Palmer without question is correct when he and his associates make changes in so-called existing standards that will in any way expedite car movement.

In this day and age quick service is more important than ever before, since we are losing much traffic to faster moving vehicles. We can accomplish more in "merchandising transportation" by increasing the speed of cars than in any other way; and if by the use of two doors Baltimore can cut down the length of time that its cars stand still, even at a few stops per trip, the change should be made.

Mr. Gove's ideas as to standardization are very unusual. He would standardize the whole before he would tackle the details. This sort of standardization is the

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sickness that grips the mechanical end of the industry at the present time. The cars of many companies look alike and are of approximately the same size, but unless they happen to have been built by the same car company the parts are not duplicates, and when some part breaks or wears out it will be ordered "as per sample" or by pattern number and will be ordered from the car company that built the car. I am told that this condition applies to the one-man car just as it has always applied to cars built years ago.

If a few of the larger street railway companies should appoint a real standardization committee and start in by studying the store room shelves of the various companies with the end in view of standardizing the things worn out every year, instead of wasting effort in an attempt at standardizing the car body, which is purchased once every twenty or twenty-five years, real progress would be made.

With motors of approximately the same horsepower, axle bearings, armature bearings, brushes, commutators, armature coils, pinions, pinion nuts, armature shafts, etc., are the things which wear out and are the things which should be easily and quickly duplicated.

The wearing parts of trucks have received much attention and are fairly well standardized now, but the castings and parts that break are still ordered usually by pattern number from the one company which originally built the truck.

We might study the store room shelves that hold the glass, seat castings, car trimmings, sash fixtures, sign curtains, sign and curtain rollers, etc., as a real start toward car body standardization.

Most of the large street railway companies already are doing a great deal to cut down the number of parts carried in their store rooms. What is needed is a coordination of the efforts of the store room and mechanical men of the larger roads and the use of existing standard parts when a new car is built, as far as possible.

While it is of advantage to the car builder to have on his shelves for quick shipment a standard car, yet the larger street railway companies had better spend a little more money for their cars (which, after all, are purchased only every twenty to twenty-five years) than to build an addition to their store rooms or even purchase a car that is not the last word in attracting traffic or handling it safely and expeditiously.

P. N. JONES,
General Manager for Receivers.

*Reflection of the California Resolution**

MILWAUKEE, WIS., Jan. 31, 1922.

To the Editors:

The Wisconsin Electrical Association, of which the writer is president, has received a copy of a resolution passed by the California Electric Railway Association and protesting against the publication of BUS TRANSPORTATION by the ELECTRIC RAILWAY JOURNAL.

While not attempting to speak for our association, but as an officer, charged with the operation of street and interurban railways, of several companies, I feel that the publication of this journal by your interests insures the dissemination of correct information about the bus and its possibilities. We all want the truth, and if it can be shown that bus transportation is better and cheaper than the transportation now afforded by street and interurban lines, it is only a question of time until such bus transportation will supplant electric transportation. In my judgment the bus cannot and will not supplant electric transportation, but there will be a great many publications which will attempt to prove that it can and will supplant electric transportation.

I am glad that the ELECTRIC RAILWAY JOURNAL has taken up the work, and feel that through it correct information will be published. J. P. PULLIAM.

[The above is but one of many expressions received during the last ten days by the editors of this paper approving the publication of BUS TRANSPORTATION. The editors sincerely appreciate this support. They also hope that the restatement of the position of the paper, given in the JOURNAL last week, will convince all doubters, if any remain, of the wisdom of starting BUS TRANSPORTATION.—EDS.]

*See ELECTRIC RAILWAY JOURNAL, Feb. 4, page 181.

Electrification of Manufacturing Industries Versus Railroads

NEW YORK CITY, Feb. 9, 1922.

To the Editors:

In your editorial comment in the issue of Jan. 28, 1922, entitled "What Forces Are Potent in Shaping Railroad Electrification Progress?" the statement is made that "The railroads are using up the country's fuel at such a rate as to alarm every one who is responsive to data."

The recently issued report of the Superpower Survey shows that by proper application of electric power to manufacturing industries the amount of coal that can be saved is double that claimed possible by railroad electrification. It is also shown that this would require an investment of $185,000,000 to provide the motor equipment necessary to receive and use this power, whereas the amount of capital stated in the report as necessary for railroad electrification is $570,000,000.

Does it not seem that the propaganda for railroad electrification conducted by the electrical manufacturing interests has suggested the statement quoted above?

Not long ago I read in one of the New York daily papers that Secretary Hoover had suggested that some means be found by which some of the idle vessels of the United States Shipping Board be chartered at low rates to coal exporters in order that the coal export trade of the United States might be stimulated.

Why then this support to the idea that the railroads are using up the country's fuel at an alarming rate?

Is not the technical press of the country in a position to supply its readers with information that may not be misleading?

EUGENE BETTS,
Electrical Engineer.

[The only propaganda in which this paper is interested is that which is designed to give the country better transportation service of all kinds. No effort has been spared, or will be spared, to secure data that will be accurate and useful to the transportation companies. —EDS.]

The American Engineering Standards Committee reports that there are now national standardizing bodies in the following fourteen countries: Austria, Belgium, Canada, Czechoslovakia, France, Germany, Great Britain, Holland, Italy, Japan, Norway, Sweden, Switzerland and the United States.

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One-Man Cars and Buses Prove a Live Subject

New England Street Railway Club Hears a Report and General Discussion —Railways Are Urged to Consider the Use of All Types of Vehicles as Part of a Co-ordinated System

THE Feb. 2 meeting of the New England Street Railway Club, which was held at the Copley-Plaza Hotel, Boston, was devoted to a discussion of the development of the one-man car, the motor bus and the trackless trolley. The meeting was the largest held for some time, there being 176 present, which reflected the interest among railway men that is being taken at present in this subject. Edward Dana, president of the association, presided and after an address by Robert I. Todd, president of the American Electric Railway Association, and the presentation of the report of the committee, which is given elsewhere in this issue, the meeting was addressed by others interested in the subject.

In his remarks Mr. Todd said:

"In the midst of electric railway activities in the Middle West, my mind many times turns to New England where I spent some very pleasant and interesting years in the electric railway business.

"Fifteen years of active service, in the direction, management and development of street and interurban railways in the Middle West have been most interesting and eventful. During that period I have witnessed the marvelous growth of street and interurban railways in the States of Indiana, Illinois, Michigan and Kentucky, until today Indianapolis is recognized as the center of the great network of railways which reach out in all directions and comprise more than 5,000 miles of road. Boston may be the center of the universe, but we believe that Indianapolis is the center of the interurban electric railway systems.

"Much good has been accomplished in the states which I have named, by the Central Electric Railway Association, which has been the means of bringing the officers and managers of the different companies closer together, standardizing equipment, issuing joint passenger and freight tariffs and unifying the industry generally. But the greatest benefit to electric railways as a whole in the country has come through the American Association.

"We have so many legislative, executive and operating problems in common in the industry that a nation-wide organization is of incalculable advantage; so much so that companies who are not members of that association are apt to lose much in not being affiliated. The executive committee of the American Electric Railway Association holds monthly meetings at which are discussed the most vital problems affecting our interests. It is the desire of its officers that every live street and interurban railway company in all sections of the country become members.

"Let me here extend to you a most cordial invitation to attend the mid-winter meeting of the American Electric Railway Association which is to be held in Indianapolis on Tuesday, Feb. 28.

"As president of the American Association I am afforded an opportunity of surveying the electric railway field throughout the country, and it is a pleasure to note the character and accomplishments of the New England Street Railway Club. You have contributed in no small measure to the growth and development of every city and town in New England and made this section of the country a veritable beehive of industry. While enjoying the benefits of street and interurban railway transportation we sometimes wonder if the public fully appreciates what an important factor your association has been.

Problems Confronting Industry

"The problems which confront our industry are very much the same everywhere and may be principally summed up in the two titles—'Earnings' and 'Operating Expenses.'

"A proper rate of fare based upon a reasonable return on a fair valuation is the first requisite in the transportation business. Many of the failures of street and interurban railway companies in the past are due to the fact that this fundamental principle was not fully recognized by the public and the rate-making bodies, or if recognized, was ignored. Fortunately, a better understanding now prevails between the public and the electric railways and there is every reason to believe that with co-operation, justice and fair play will supersede antagonism and ruinous opposition.

"Those who have studied the electric railway situation are unanimous in their opinion that we have passed through the darkest days and that electric railways will in the not far distant future occupy a most important place in the business of the country. The exploitation of street and interurban railways is no longer popular. The public has learned wisdom and is now convinced that the growth and progress of cities and towns is so closely linked with electric railway transportation that the destruction of the one means the ruination of the other.

"With the various after-war problems of these days must come a readjustment of wages and a curtailment in operating expenses, without impairing service, if we are ever to reach a safe and normal basis. This brings up many perplexing questions but we must heroically face them. Commodities and supplies as well as the cost of living, although somewhat reduced, are still far too high. As the cost of labor enters largely into all our necessities we cannot have the anomaly of low prices and high wages. There must be a parity between the two. It would seem that both employer and employee recognizing the force of these conditions ought to be able to reach a mutually satisfactory understanding.

"Financiers who are now studying electric railway problems as never before are practically a unit in the belief that street and interurban railway securities have a bright future. While suffering much depression, they have nevertheless withstood the strain of war conditions and inadequate fares. With fair and equitable treatment on the part of the public and rate-making bodies we have every reason to believe that these securities, which are held by hundreds of thousands of investors throughout the United States, will increase in value and that the industry which we represent will once more flourish and prosper, not perhaps immediately as the scriptural 'Green Bay Tree,' but surely, steadily and substantially.

"Our great electric railway systems are bound to see a better day. In proof of this one has only to note the strength and character of the men who direct and manage them. Here, today, are assembled those through whose veins course the fighting and determined spirit of the men of Concord and Lexington. In the Middle West the undaunted spirit of Lincoln and the early pioneers still survives. While, in the Far West, the fearless, unflinching and progressive spirit of those who conquered the plains and streams, mountains and forests, still serve as a high and noble inspiration to their posterity.

"Let us then, Mr. President, turn our eyes to the rising sun of a better day which is already beginning to cast its bright rays upon the hitherto darkened spots of hampered opportunities and decreased revenues. Let us feel its warmth and inspiration, strong in the hope and belief that the full meridian of prosperity is not far distant."

Discussion on Committee's Report

In presenting the report of the committee, Chairman L. D. Pellissier, Holyoke Street Railway, said that inasmuch as the report had been printed and distributed it would not be read. However, he pointed out that two-man cars occupied the largest field in New England and the data collected showed 1,368 such cars in operation during normal hours with 2,532 during the rush hours. Of the two classes of one-man cars operated 417 out of a total of 703 in normal hours and 517 out of 914 during the rush hours are former double-truck cars converted to one-man operation. The balance in each case are light-weight single-truck cars. Three companies operate from ten to twelve motor buses. The committee believes, as shown in its report, that the electric railways in order to func-

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tion properly must use the most economical form of vehicle to handle the traffic offered.

H. B. Flowers, United Railways & Electric Company, Baltimore, said that the railways should no longer kid themselves about the failure of the jitneys in Bridgeport, Toledo and other cities mentioned in the report, for with a real organization and equipment the story might have been different. In Maryland the commission has fixed the trolley fare to meet the rising costs of operation and at the same time has forbidden direct motor bus competition with the railway.

Company Asked to Run Buses

As the commission believes that transportation is a monopoly and as such should be protected it called in the Baltimore company and asked it to run buses to certain sections, which the company has agreed to do.

In speaking of the report of the committee he said it was a little negative where it referred to one-man cars. The little Birney cars he held were no good for handling heavy traffic and told how the Baltimore company had redesigned them, increased their weight, their width, made the aisle 4 in. wider and provided a wider service door, with the result that they now have a good car.

There was a possibility of using different vehicles in transportation, according to C. W. Kellogg of Stone & Webster. Intelligent operation calls for using the most economical type. He urged keeping the situation whole and not going crazy over the motor bus, for the one-man car represents a large investment in the railway business. The electric railway, according to the press, is going backward due to the gas-driven automobile. This, however, is not the case for an analysis of rail operations shows a steady increase in rides per capita. What the automobile has really done is to increase moving around. This has resulted in an increase in the rides per capita of 25 per cent notwithstanding the fact that there are nine or ten million automobiles in use.

The safety of one-man car operation has been more bitterly attacked in Boston and New England than in other parts of the country, and to show that these attacks were not justified he quoted the figures given on page 237 of this issue for operation in 1921 where both one and two-man cars were operated by Stone & Webster companies.

In speaking of what was the proper use of different type of vehicles Mr. Kellogg referred to the paper by Messrs. Pick and Shave before the 1920 A. E. R. A. convention. This paper pointed out that on the density of traffic depends the choice of unit. He believed that the figures given in this paper were worthy of consideration, and said it really was a case of what sort of traffic has to be handled.

He pointed out that the New York subway handled 70,000 passengers per hour in one direction on its ten-car trains. The real question in motor bus operation appeared to be "what to do with the existing investment." If an entirely new transportation system was to be laid out it might be a different story. The one-man car he claimed has been the salvation of the transportation industry from the public standpoint and also for many companies as it has given the cheapest service that can be furnished.

This is evident from the fact that there are to-day at least 5,500 one-man cars in the United States that run 200,000,000 car-miles and carry nearly one billion passengers annually. Their operation has saved the companies operating them $12,000,000 in operating expenses notwithstanding they have added a million dollars to operators' wages.

The next speaker was Col. G. A. Green, general manager Fifth Avenue Coach Company, New York. He characterized the report a fine piece of work but said he was an unashamed exponent of the motor bus as he had spent twenty years in its operation. The one-man car was a logical development but he held that it should be built as light as possible, and urged that light-weight alloys and modern methods of body construction be employed. A more extended abstract of his remarks appears in the February issue of Bus Transportation.

J. A. Queenay of the General Electric Company, the next speaker, commented on the report. He said that the possibilities of the light-weight double-truck car were great, but that as yet it had only been used to a limited extent. One instance was mentioned where it was being used on a 27-mile interurban line having twenty-two fare zones and that a 20 m.p.h. schedule was being maintained satisfactorily. One of the first electric railways in New England to use the light-weight single-truck safety cars was the company in Bangor. This company is now about ready to make use of the double-truck light-weight safety car on one of its interurban lines.

The motor bus, he said, had come to stay but he did not agree that the trolley bus did not also have a place. He compared their advantages and disadvantages and outlined the trackless trolley developments since the tests made at Schenectady last June.

K. A. Simmon, Westinghouse Electric & Manufacturing Company, was still enthusiastic over the railway track and all, and could see a lot of good yet in rail transportation. His remarks followed closely the sense of the article appearing in this issue on page 233.

Carl H. Beck, Westinghouse Electric & Manufacturing Company, said that the single-truck type of safety-car was but a forerunner of the double-truck, one-man car that is now being developed. The idea of the single-truck one-man car is only five or six years old, but nevertheless it is now a certainty and as such is being used by all of the railways that are trying to deliver street car service at the lowest cost.

Two years ago he said he stated that within five years there would be no such thing as a two-man car in operation. He still is of the opinion that there will be very few and urges that more attention be paid to changing over existing two-man cars for one-man operation.

H. E. Howell, National Railway Appliance Company, New York, in comparing the cost of street-car operation with that of the motor bus declared that the street railways should purchase their power from large power companies, as under their present conditions of operation they had to maintain a large power reserve. One kilowatt consumption at the car requires practically 3 kw. capacity in the power plant. Reference was also made to the practice in Chicago of purchasing power which was instigated as far back as 1907, when the new ordinances became effective.

More constructive thought should be given, he believed, to the design of the underframe of not only the one-man car but to the motor bus. One-man cars he said were soon to be operated in London.

G. E. Pellissier, Holyoke Street Railway, was in hearty accord with the idea propounded by the committee that it was the duty of street railways to use what ever was the most economical vehicle for the form of transportation service rendered. He held that all things considered the railways should not be prejudiced for or against any particular type or design of vehicle or motive power. Continuing he said:

Three Things to Keep in Mind

"In considering the requirements of public transportation, at least three things should be kept in mind—necessity, desirability and cost, proper weight being given to each of these elements. The conclusion as to the service to be rendered in any particular case, should be based on a careful analysis of these elements. It might well be that these factors would not be given the same weight in different localities and under different conditions. In some places people might desire, above all things, low cost; in others, frequent headway; in others, high speed; while in others a compromise of all of these three might prove more satisfactory.

"In the matter of cost of transportation, it is necessary to be extremely careful as so many elements affect the cost that a comparison of costs for furnishing transportation is difficult, and further, that some kinds of service would not be tolerated at any cost.

"While a good deal has been said about merchandising transportation, in the business of transportation of the public, to a greater extent than per-

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haps in any other business, is it true that the best advertisement is a satisfied customer. In some businesses it may be possible to succeed, temporarily at least, by fooling all of the people part of the time or a part of the people all the time, but in our business, we have to deal with all the traveling public all the time and we cannot hope to succeed that way even if we desired to do it.

"If, through lack of analysis or faulty analysis, we make wrong decisions, sooner or later we—and I mean by that the whole industry—shall have to suffer for them.

"In analyzing various methods of transportation, I would like to emphasize the importance of speed on account of its influence, not only on the cost of operation but also on account of its relation to desirability of the service.

"The average American wants to get there and is usually willing to pay the freight when the goods are delivered. While the slogan 'A car always in sight' may be a good one, we want to be sure that the reason for this isn't that it takes so long for the car to get out of sight.

"I believe the possibilities of speeding up schedules would surprise a good many street railway men, and if they figured carefully what could be done in this direction, they might find in many instances that they could go to considerable additional expense to obtain higher speed and still be able to furnish transportation at a lower unit cost.

"Nobody advocates or wants to advocate using two men to do the work which can be done just as well by one, but this does not warrant the conclusion, off-hand, that the employment of less men necessarily reduces the unit cost.

"In spite of the fact, however, that elevator manufacturers have been successful in developing a type of elevator which can be satisfactorily and economically operated by push-button control, I do not find them making the statement that this particular type of elevator should be used in all places and at all times, and should be immediately adopted by everybody as is the case with some of our street railway enthusiasts who have used some particular type of vehicle or system of transportation successfully.

"Among the elevator men undoubtedly will be found some conservative enough to advocate 'hooking her to the biler.' But even they do not go so far as to urge the use of the same type of elevator in the Equitable Building in New York as in an apartment building or a two-story loft building.

"In analyzing the problem of furnishing transportation to the public, it would seem also that it might be well to take into our confidence the fellow who is going to use the service and pay for it. It might be possible to obtain from him his view before jumping to the conclusion that because we want to adopt a certain method of fare collecting, that he will like the pay-as-you-enter feature or because we want to eliminate one man from the car, that he is going to like a type of car with the entrance and exit equipped with various obstacles such as barriers, rails, turnstiles, etc.

"It may be that he will, but if the situation is explained to him, and he is fully aware that the reason for doing this is to reduce the cost of his ride a fraction of a cent or a few cents, he may prefer to pay a trifle more and get something that he likes.

"This applies particularly to speed and I believe many times the public would choose speed rather than frequent headway, if they were sure to obtain reliable and speedy operation at less frequent intervals.

"This I think is sufficient to illustrate the idea in mind and I only want to reiterate the necessity of careful analysis of the needs and desires of the public in the way of transportation and a careful study of the cost, not only with various types of vehicles, but with the various methods possible with each type.

"I wish further to emphasize the importance of cost accounting in transportation. Having made this analysis, my recommendation would be to select the tool for the job and use the one which gives the best results, all things considered."

Ralph D. Hood, Massachusetts Northeastern Street Railway, said that four Birney cars had been operated in Rochester, N. H., since June 1, at a considerable saving over the cost of the standard two-man type of car. He gave the costs of operation per car-mile for the safety cars as follows:

	Cents
Way and structures—(prorated on a flat basis)	6.18
Equipment	2.82
Power	4.77
Conducting transportation:	
Labor	5.26
Miscellaneous	4.22
Traffic	.64
General and miscellaneous	2.64
	26.53

Less mileage was operated by 4 per cent with a 27 per cent saving in kilowatt-hour usage. Of the total service run 56 per cent was Birney car operation. The total saving of one-man operation over the two-man operation was 10.07 cents per car-mile, since the cost of two-man operation was 36.58 cents per car-mile.

Mr. Hood is optimistic as to the future and says that "street railways having lived since 1917 are due to live on for a great and glorious life."

New England Club Committee Analyzes One-Man and Bus Situation*

In Thirty-seven Page Pamphlet Committee of New England Street Railway Club Presents Results of Several Months of Study of Available Data on this Subject—The Inter-Relation of These Vehicles Is Outlined

THE New England Street Railway Club has had a committee at work for some time making an analysis of the development of the one-man car, the motor bus and the trackless trolley and this committee rendered its report to the club at its dinner at the Copley-Plaza Hotel, Boston, on Thursday evening, Feb. 2. The report has been issued in printed pamphlet form, some thirty-seven pages long, and is quite full in presenting not only the history of the development of these three transportation units but also the viewpoint of the committee with respect to them.

In starting the report, the committee makes the following statement:

"The committee has approached the subject assigned to it with the one though foremost in the minds of its members that the industry owes it to itself and to the riding public to adopt any development in the art of transportation which will give the public good transportation at the lowest possible cost. Of the three vehicles assigned to the committee for its consideration the one-man car has been the most used by street railways. The experience of the companies which have used this method of operation to a considerable extent for the past three years should be of great assistance, not only to themselves when considering its extension, but also to other companies when considering its adoption. In reference, however, to the motor bus and the trackless trolley, the experience of street railways is as yet very limited, and your committee hesitates to prophesy what the future developments will be because of the lack of sufficient information on which to base a judgment.

"It is to the mutual advantage of the street railways and the public that a proper standard of transportation should be maintained. We are all interested in performing to the best of our ability the public service delegated to us. At the same time we are interested and the public is interested in having that service rendered at a low cost. We feel that the street railway transportation as now constituted, that is, with electric cars running on steel wheels on steel rails, has passed through the experimental period as well as through its period of greatest trials in the past few years and has entered upon a new era which will increasingly demonstrate its necessity. At the same time there is taking place

*Digest of report of the committee on development of one-man car, motor bus and trackless trolley presented to the New England Street Railway Club at its dinner meeting on Feb. 2, 1922, Copley-Plaza Hotel, Boston.

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the development of rail-less transportation which may be demonstrated, as time goes on, to be more economical for some kinds of service.

"If there is anything in this report which will help to show the street railway operator in what manner he can adapt the rail-less transportation to his needs as well as the one-man operation of street cars, your committee feels that it will have well served the purpose for which it was appointed."

The report then reviews the history of development of one-man operation on cars, showing that at present there are at least 914 one-man cars in operation in New England in the rush hours. These may roughly be divided into two types, the light-weight single truck and the heavier double truck. Of the 914 one-man cars in such service 455 or 50 per cent are of the light-weight type and 417 or 46 per cent are of the heavier double-truck type. Most of the single-truck cars are new equipment, especially built for one-man operation; they are generally equipped with the latest devices for control of the car. The double-truck cars, on the other hand, are principally former two-man equipment changed over. The extent of the changes varies all the way from a complete installation of the latest devices to no changes whatever. In this changeover, also, the committee points out that there has been little uniformity among the various companies. Generally speaking, such changes have been made when each company believed it necessary in order to facilitate the handling of passengers in and out of one end of the car, properly collect the fares, and give the public proper protection.

As to weight of equipment, the first single-truck cars weighed about 10,000 lb., but at this time the weight has been gradually increased to about 16,000 lb. The committee states that actual operation shows these heavier cars to be more serviceable than the extremely light ones. The committee commends the development of the light-weight — 27,000 lb. — one-man double-truck car. This is the latest development and these cars are just being put in service in New England.

"One-man car operation" the committee says, "is an established electric railway practice. There can no longer be any doubt as to the desirability of its use under a great many different operating conditions. At the present time in New England one-man cars are used in practically every kind of service with the exception of heavy city traffic where train operation is advisable. They are operated on interurban lines with schedule speeds as high as 15 m.p.h., and in city service with a frequency as often as a car every two minutes. They are operated in the subways of Boston. They are in service on lines of one fare zone and on lines with seven or more zones. There are cities of medium size where the service is almost entirely one-man operated."

The committee also points out that coincident with the development of the one-man car came the light-weight car. This has made possible many economies in addition to saving in labor, such as power and lower maintenance of equipment and maintenance of way. Of these savings, that of power is very tangible and of a considerable amount; the maintenance of equipment is hard to determine, but experience shows it to be material, whereas the saving in maintenance of way is at least tangible but can only be definitely established over a long period. The committee points out that if track is once put in good condition, it can be maintained in such condition if used only by light-weight cars, with a surprisingly small expenditure.

The committee discusses the complications of fare collection on one-man cars except where the prepayment plan is used with one fare collection. The committee makes no recommendation or draws no particular conclusion with reference to difficulties of fare collection.

The committee does say that experience with one-man cars shows that it is desirable to provide all reasonable facilities for expediting the movement of cars and that usually the savings from the operation of such cars warrants the providing of such facilities. Those facilities mentioned are electrically operated track switches and automatic signals. On account of the combination of duties of motorman and conductor, the committee points to the particular importance of arrangement of light and the proper protection from glare on the front window.

With reference to the serious operating problem in connection with the loading and unloading of passengers, the committee discusses the delay of the single entrance and states its belief that much may still be accomplished along the line of securing a double flow of passengers. Admitting that the problem is somewhat complicated with various fare and traffic conditions, the committee ends its discussion on this subject by saying: "We believe, however, that there is sufficient ingenuity in the industry to work out a solution of this problem which as yet has not been entirely solved."

THE MOTOR BUS

In its study of the motor bus, the committee gives a brief history from July 1, 1914, when as it says, "The first jitney charging a 5-cent fare appeared in Los Angeles, Cal." The story follows briefly through the stage of wild-cat operations to the present time. The committee points out its opinion that a large part of the growth from 1914 to 1920 was the result of the attitude which the automotive industry had in marketing its products, wherein it confined itself almost exclusively to selling the pleasure car or a motor truck chassis with engine installed to independent motor bus drivers, who in most instances competed directly with the street railways throughout the country. The report goes on to discuss types of vehicles, and their cost of operation.

THE TRACKLESS TROLLEY

In discussing the trolley bus the committee gives first a historical sketch of its development both abroad and in this country. In the entire development so far of trolley buses operation has not extended to more than 200 miles of route, and then in widely different parts of the world and which naturally have a great variety of operating conditions. Operating costs are estimated to be 25.51 cents per bus-mile. Some of the advantages and disadvantages of the trolley bus are listed. A more extended abstract of that part of the committee's report on the use of motor buses and trackless trolleys is given in the February issue of BUS TRANSPORTATION.

In conclusion the committee recommends that New England Street Railway men keep constantly in mind the possibility of adopting any one of these three methods of transportation in the development of their services.

SUMMARY AND CONCLUSIONS

In conclusion the committee recommends that New England street railway men keep constantly in mind the possibility of adopting any one of these methods of operation in the development of their service. It then says:

"The committee hesitates to recommend in a report of this sort just where any individual street railway operator should adopt these different methods of transportation, but feels that street railway men as a whole ought to be quick to recognize the possibilities of these new methods and are in duty bound to adopt them in carrying on the natural monopoly which they have for street transportation of passengers in the various districts they serve, wherever careful analysis of the situation shows that as good or better transportation could thus be provided at less cost than by the present methods.

"In the matter of one-man operation, the committee is of the opinion that it has been demonstrated that a properly equipped electric car can be operated by one man under many different operating conditions with advantage to the public and the street railway. Further, this method of operation has the indorsement of our public authorities and should direct our attention to operation of cars with one man whereever careful analysis shows that this can be done to the benefit of the service, all things considered. In addition, the recent development on certain properties of the so-called light-weight double-truck car, whether operated by one man or two, should be studied closely, as the committee believes that there is a considerable field for this type of car, particularly for one-man operation.

"Relative to the motor bus and trackless trolley considerable advancement has been made during the past year

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and the manufacturers of each now have in mind to a large extent the needs of street railways. There are certain portions of street railway lines now existing where on account of the expense involved it is undoubtedly impracticable to rebuild the tracks and where it might be preferable either to abandon or tear up the tracks and by the addition of another overhead wire install the trackless trolley. The committee believes that in many instances it would be preferable before even going to the expense of installing trackless trolley to install a motor bus service over the line on which the tracks have been selected for abandonment and to try out the motor bus for a period before undertaking the expense of equipment for the trackless trolley.

"The committee feels that the street railway operators should keep these two vehicles constantly in mind when contemplating extensions of lines either within or without the territory now served by them. In the early days of operation on these extensions we suggest to the operating officials the advisability of using the motor bus until the final route has been established and a sufficient amount of traffic has been created to warrant expenditure for equipment of the trackless trolley line. In the establishment of extensions to the street railway lines, during the development period there seem to be three different stages that the street railway operator should contemplate with the three vehicles that have been studied by this committee:

"1. A motor bus service tried out over various routes in order definitely to establish the route by which it will best serve the public at the least expense.

"2. The trackless trolley service placed in effect after the route has been established and a sufficient number of riders obtained.

"3. The laying of tracks and car operation as the community becomes built up and the receipts warrant the capital expenditure.

"Once the tracks are laid the question of one or two-man operation should be carefully figured to determine which will be the more economical and satisfactory, all things considered.

The committee gives credit to the following organizations and publications for information used in compiling its report: ELECTRIC RAILWAY JOURNAL; American Electric Railway Association; Public Service; *Aera;* Public Service Commission of Massachusetts, annual reports.

Courts vs. Commissions

New York Judiciary Committee Condemns Unjudicial Acts of State Commission in Report to Legislature

A SCATHING criticism of the unjudiciary nature of the decisions of some state commissions is contained in a report of the judiciary constitutional convention to the Legislature of the State of New York, dated Jan. 4, 1922. This report is the result of a study made by the direction of the Legislature last year by the judiciary of the state to report to the Legislature proper amendments to the judiciary article of the constitution. The chairman was William D. Guthrie, and the executive committee was made up of prominent members of the bench and bar. A portion of the comments on commissions follows:

"For centuries before our Revolution, it had been regarded in England to be a sound constitutional principle, as phrased in Magna Charta itself, that all should be entitled to trial in courts of justice held or presided over by judges who know 'the law of the realm and mean to observe it well.' The reasons which have led the convention to the conclusion that an express provision is now needed are substantially as follows:

"Of the political phenomena of our times, perhaps none is more striking than the constant extension of the functions of government, with the consequent multiplication of public officials and of interference with the conduct of private individuals. The tendency to extend the activities of the state has been world-wide. for manifestations of it are observable in every country, whatever the form of government may be. The Great War has markedly, if not portentously, accelerated this tendency. In the United States, there are everywhere being developed at enormous cost in the most intensive fashion a multitudinous bureaucracy with autocratic powers and arbitrary discretion, and a vast system of complicated and often conflicting administrative jurisdictions in relation to property and businesses and personal conduct, which reach and affect almost every individual, and most of which, only a few years ago, would have been regarded as of strictly private concern and not to be tolerated by a free people. Extensive legislative, executive and judicial powers are being vested and combined in administrative bodies in distinct and reckless disregard of the sound principle of the separation of governmental powers, which was deemed so essential to the due protection of individual rights by the wise founders of our republican form of state governments. Even controverted questions of law and fact, hertofore regarded as fundamentally and exclusively for judicial determination, are being entrusted to bureaucratic discretion, and for orderly judicial procedure as known to our fathers and the competent and impartial interpretation and enforcement of the laws by learned judges and impartial juries, arbitrary methods and untrained judgment are being constantly substituted. The increase in public functionaries and public expenditures within the past twenty years in our own State and municipalities has been at a rate which is regarded by many thoughtful and competent observers with alarm as imperiling not only our liberties but the very solvency of the State and its cities. Chief Judge Cullen warningly said in one of his instructive opinions: 'The great misfortune of the day is the mania for regulating all human conduct by statute, from responsibility for which few are exempt, since many of our most intelligent and highly educated citizens, who resent as paternalism and socialism legislative interference with affairs in which they are interested, are most persistent in the attempt to regulate by law the conduct of others' (*Matter of Hopper v. Britt,* 204 N. Y. 524, 534).

"There can, indeed, be no doubt that there is an impulse and tendency in this State, as elsewhere, to vest judicial powers in administrative bureaus composed of officials untrained in the law and to make their findings more or less conclusive. This policy involves a menace to the inalienable personal and property rights of all our citizens and to all our ideas of the due and fair administration of justice according to law. The people of the State of New York, if acting advisedly, are, it is profoundly believed, not likely to be willing to vest or leave any such absolute and unreviewable judicial power over their most sacred personal and property rights in untrained officials frequently utterly ignorant of the most elementary principles of justice as developed in jurisprudence from the experience of ages.

"Moreover, hearings before administrative boards or commissions are frequently very unfair and often place any person or corporation affected or aggrieved at a great disadvantage. Proceedings are being constantly instituted by such boards or commissions of their own motion; they allow themselves to become committed to certain views which they do not hesitate to publish; they declare in the public press, before hearing any affected or aggrieved party, or hearing both sides, that they will or intend to do such and such things (*e. g.,* reduce rates of carriage or telephone or light or other public service) in complete disregard of the most elementary principle of fair play embodied in the maxim that no man should be condemned unheard—*audi ulteram partem.* When the hearings do begin, the board or commission is often already committed, not to say prejudiced, if only unconsciously, in favor of preconceived and adversary views. The counsel of the board or commission, in daily conference with its members, has an immense and unfair advantage over his adversary representing the individual or corporation whose property or personal rights are involved or menaced.

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The board or commission, in a word, in many cases acts as judge in its own case, instituted by it, pressed before it by its own counsel, and as to which it has, sometimes with much clamor and boasting, published its preconceived views. Such a board or commission becomes what a distinguished English law writer has called 'that judicial monster, a judge in his own cause.' These boards or commissions necessarily become partisans, and the whole atmosphere is the very negative of what a court of justice ought to be or what American fair play should guarantee. It is in essence the determination of rights by bureaucratic fiat. And it ought to be pondered long and carefully that the risk of the ultimate development of arbitrary and irresponsible power and bureaucratic tyranny is altogether too great to be suffered to exist or permitted to be extended in this State.

"To hold up such performances as fair hearings or quasi-judicial proceedings before an unprejudiced and impartial tribunal is verily to travesty all that honest and fair-minded men conceive to be embodied in and guaranteed by the term justice. Yet, there is a strong movement in this State and elsewhere to make the findings of such boards or commissions conclusive and final, generated by impatient reformers or propagandists who would avoid the delay necessarily involved in being just! The proposed amendment will guarantee to all affected or aggrieved an ultimate hearing by a real court of justice whenever interference with or violation of private rights is threatened.

"The Supreme Court of the United States has, for example, recently held in a rate-fixing case that a fair opportunity must be provided by the state for submitting the question whether rates are or are not confiscatory to the determination or some judicial tribunal acting upon its own independent judgment as to both law and fact and that 'otherwise the order is void because in conflict with the due process of law clause, Fourteenth Amendment' (*Ohio Valley Co.* vs. *Ben Avon Borough*, 253 U. S. 287, 289). But this salutary ruling still leaves it within the power of a state, unless restrained by its own constitution, to unite administrative and judicial powers in the same body, and thereupon to deny any appeal to real and competent courts of justice. *Prentis* vs. *Atlantic Coast Line*, 211 U. S. 210, 225; *Reetz* vs. *Michigan*, 188 U. S. 505, 507; *Hibben* vs. *Smith*, 191 U. S. 310, 321.

"It is submitted that it should be of paramount concern to all classes of citizens that their personal and property rights should not be placed or left within the power of any administrative board or commission or bureau to determine conclusively without right of appeal to the courts of justice of the state, and that the authority to delegate any such arbitrary power to administrative bodies by constituting them courts should not be left any longer in the hands of the legislature unrestrained by constitutional limitation."

The Tax Exempt Security Attacked Again

THE following resolution was adopted by the Oregon State Chamber of Commerce at its third annual convention, which convened in Portland, Ore., Jan. 3, 1922:

Whereas our present policy of Federal taxation has undergone a most radical change from that of indirect to direct taxation and

Whereas such change has resulted in chief reliance being had upon a graduated scale of taxation upon income that levies high rates upon those of large income, and

Whereas by reason of such rates there is a constantly increasing volume of capital being invested in and diverted into non-taxable securities of the Federal, state and minor subdivisions of government and instrumentalities of government, and

Whereas the investment and diversion of such capital has proved a serious handicap to productive enterprise and has given to such exempted securities an unfair competitive advantage in the markets for capital, and

Whereas such investment on the part of those of large income serves to exempt them from the payment of taxes they otherwise would be obliged to pay, and

Whereas there is thereby necessarily imposed upon those who cannot benefit by such exemption an unfair burden of taxation; now, therefore be it

Resolved, by the Oregon State Chamber of Commerce in third annual convention assembled, that it recommends that necessary corrective legislation be provided to remove the present inequitable burden of taxation and to make all income from whatever source and in whatever form bear its just proportion of the cost of government and remove the discrimination now prevailing between securities of government and those of private enterprise, and, be it further

Resolved, That a copy of this resolution be transmitted by the secretary to each member of Congress from Oregon.

It will be the cumulative effect of such action as this which will be necessary ultimately to secure elimination of the tax exempt security.

A. S. T. M. to Meet at Atlantic City

THE annual meeting of the American Society for Testing Materials will be held during the week of June 25, at Atlantic City, N. J., with headquarters at Hotels Chalfonte-Haddon Hall. Monday, June 26, will be given over to committee meetings, and the convention will open Tuesday morning, June 27, and close Friday evening or Saturday morning, July 1.

Union Internationale de Tramways

THE Union Internationale de Tramways et de Chemins de Fer d'Intérêt Local, whose headquarters are in Brussels, will shortly be reorganized. This step has been decided upon by the executive committee because before the war the membership was made up of companies from all parts of Europe, and the purpose now is to confine the membership to the railway companies in the allied countries and those neutral during the war. To do this, disbandment of the old association and reorganization seem to be the simplest way from a legal standpoint. It is hoped that a convention under the new auspices will be held during the current year.

American Association News

Publicity for the Midyear Meeting

J. W. WELSH, executive secretary, has sent to member companies a suggested newspaper notice for local publicity on the Midyear Meeting to be held at Indianapolis on Feb. 28. This is intended, apparently, as a suggestion to individual railways to use the Midyear Meeting as a further legitimate means of keeping the electric railway industry prominent in the eyes of the general public.

The notice mentions the place and date of the meeting, suggesting that railway men from all over the country will be present, and then indicates a mention of local men who will attend. A general outline of the principal subjects is given, stress being placed upon the discussion of trackless transportation, and President Todd is quoted as to why the association should study this question and as to where the bus may fit in.

Convention Train de luxe Danville to Indianapolis

THE Illinois Traction System will operate a 4-car train from Danville, Ill., to the Feb. 28 convention, according to plans of H. E. Chubbuck, vice-president executive of the company. The train will comprise a 60-ton locomotive, a passenger coach, a sleeper and a parlor car. The train will be hauled over the "Big Four" from Danville to Crawfordsville, Ind., and will proceed thence under its own power over the lines of the Terre Haute, Indianapolis & Eastern. Part of the equipment was built by the I. T. S. and the train will constitute an exhibit at the meeting.

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Live Topics on Way Matters Discussed at Two-Day Session of Way Committee

THE first meeting of the committee on way matters of the Engineering Association was held at association headquarters in New York City on Feb. 2 and 3. Members present included W. F. Graves, chairman, H. H. George, vice-chairman, R. C. Cram, sponsor, V. Angerer, C. A. Alden, E. B. Entwisle, E. P. Roundey, C. F. Gailor, E. M. T. Ryder, W. R. Dunham, Jr., W. W. Wysor and H. Fort Flowers. Also present by invitation were James Budd and F. A. Weymouth, Bethlehem Steel Company, and E. F. Kenney, Cambria Steel Company and chairman Committee A-1, American Society for Testing Materials.

As to car clearance easements it was decided that 6 in. may be considered a safe working clearance for all parts of the track layout. The desirability of recommending slight changes in cars to lessen end overhang and side overhang at curb corners is to be taken up with the committee on unification of car design.

The committee now proposes to offer as a "recommended design," the clearance easements presented to the convention for information last year. Members of the association are requested to submit comparisons between their present company designs and association designs applied to the same layout.

The committee adopted for submission as "recommended design" the following on location of tongue switches: "Switches should be located on the inside of the curve for lateral switches and on the righthand side, facing the switch for wye switches. Wye switches should have a straight guard at the toe of both switch and mate."

Some progress was made in the study of curved contours for new wheels. This subject was combined with the design of wheel treads and flange contours in co-operation with the committee on equipment. Mr. Flowers will act as chairman on both subjects. The committee voted to express the view: "that the contour of wheel treads should be revised by compounding the curve connecting the wheel tread and flange, better to conform to the contour of the treads of association standard girder grooved rails and flange-worn rails so that there can be only one point (or area) of contact between wheel and rail at the same time." An attempt will be made to get this subject actively before the equipment committee.

The view was expressed that one thickness of flange for wheels for all types of urban service is desirable.

The subject of impression tests for girder rails was considered at length in conference with Mr. Kenney of the A. S. T. M. The committee is inclined to favor this test as a substitute for the drop test but wishes more information regarding it.

It is proposed to modify the specification for girder rail manufacture (Wr. 2c) in respect to milling and rail ends, to read: "The ends shall be milled square laterally. They shall be undercut not less than $\frac{1}{32}$ in. and not more than $\frac{3}{32}$ in." The present specification does not provide permissible variations in undercutting but actual practice requires this.

The committee decided to recommend the adoption of the current A.S.T.M. specification serial designation "A-1-14" covering the manufacture of standard section (low-T) rails. The association has no specification for these now and the industry purchases mostly under A S.T.M. specifications. A new clause permitting milling of rail ends, where rails are for use with welded joints in streets, is to be added as follows: "25 (d) When required by the purchaser and so specified, the ends of the rails shall be milled. When so milled, the following permissible variations shall govern: They shall be undercut vertically not less than $\frac{1}{32}$ in. and not more than $\frac{3}{32}$ in. The head of the rail shall not be more than $\frac{1}{64}$ in. out of square horizontally."

As to design of substitute ties the committee decided to outline the functions of design which govern, and to analyze present designs, to determine how nearly they approach the desired features.

There was an extended discussion of the subject of arc-welded rail joints and the view was expressed that the wide interest in them demands prompt consideration of the matter of furthering research work. The work of the committee on welded rail joints was considered in this connection.

The committee decided that there is a need for standard specifications for sundry track materials such as bolts, tie plates, tie rods, spikes, etc., and members are asked to submit specifications of the items to the committee. It is hoped to have tentative specifications ready for the committee meeting tentatively scheduled for early in March.

Tables of dimensions for frogs used in tongue switch and split switch constructions were submitted by the subcommittee and it was decided to add the No. 4 and No. 10 frogs to the list. These tables will probably be available for the next meeting, when the whole list will doubtless be adopted for submission as a recommended association design.

On the subject of design of track construction for paved streets, the committee planned to co-operate with the American Society for Municipal Improvements in this matter and a questionnaire has been issued requesting data upon which to base a study of designs which may be discussed with this association.

Finally after discussion the committee decided to recommend no change in the existing specification of the association covering splice bars for girder rails, although some question had been raised regarding the chemical content. When the requirements of bars for seam-welded joints are better known it will be desirable to provide a specification to cover them.

January Bulletins Available

THE association's Bureau of Information and Service prepared the following six compilations during January, which are available to member companies upon request:

Working Conditions of Trainmen, including length and kind of runs, overtime rates and other allowances.

Wage Reduction in Other Industries—Based on a report prepared by the National Industrial Conference Board, Jan. 17, 1922.

Securities Issued by Electric Railways during 1921, showing face amount, offering price and rate of interest.

Electric Railways in the Hands of Receivers as of Jan. 1, 1922.

Electric Railways Abandoning Service and mileage of track dismantled and sold as junk as of Jan. 1, 1922.

Wages of Employees Other than Trainmen—Supplement to compilation of Dec. 1, showing wages paid employees in general maintenance and operating departments.

In addition to the above supplements to the wage bulletin, the fare bulletin and the cost of living studies have been prepared, bringing them up to date.

Research Report No. 45, "Wages and Hours in American Industry, July, 1914, to July, 1921," is now available for distribution at $2 per copy. This is the most comprehensive wage investigation undertaken in this country.

Lecture on Lumber Before Chicago Section

AT THE regular meeting of the Chicago Elevated Railroads company section, held on Jan. 24, the speaker was Russell Green of the McLeod Lumber Company, who gave an interesting and instructive talk on the lumber industry. Through the courtesy of the Southern Pine Dealers' Association he was able to illustrate his talk with a four-reel motion picture which showed the process of lumber manufacture from the cutting of the trees in the forests to the finished products, such as ties, cross-arms, poles and structural lumber.

The meeting was attended by 100 persons and was opened with the singing of "America."

Camden Section to Continue Monthly Meetings

AT A MEETING of the Camden company section No. 13, American Electric Railway Association, on Thursday, Jan. 19, the following officers were elected: President, C. V. Wallace; vice-president, W. H. Wright; secretary, George B. Stoll; treasurer, Patrick O'Connor; director for a period of three years, Edward Lowden.

There was no regular program, and the evening was spent in a social session. The executive council announced that it has been decided to continue to hold company section meetings each month on the third Thursday.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Detroit Meeting Eventful

Directorate Shaken Up — Company Given More Time to Sell Out or Get Out

At the meeting of the stockholders of the Detroit (Mich.) United Railway on Feb. 7 the Canadian stockholders headed by A. Avila Gingras voted proxies for more than 92,000 shares. Alex Dow, Detroit, and Harrison Williams, New York, were retired from the board of directors. Neither was present at the meeting. Mr. Dow's connection with the company began about a year ago when he consented to serve on the board in an endeavor to smooth out the difficulties between the company and the city.

Four other directors of the company were retired and the following board was named: Charles Laurendeau, Louis A. Gosselin, J. Ovide Desmarais, Honore Blouin, J. E. Gill, P. A. Bovin and A. Avila Gingras, all placed in nomination by Mr. Gingras, and J. C. Hutchins, Allan F. Edwards, A. J. Ferguson and E. W. Moore, nominated by Mr. Moore. The four last named were re-elected. Mr. Laurendeau also was a member of the 1921 board.

Not all the new directors will sit on the board permanently it was announced. The stockholders intend to replace three of the members with Detroiters, making the board consist of five Canadians and six Americans.

No one was named to fill the offices of president, vice-president and treasurer and it was announced that the three vacant offices would not be filled for the present. The officers named are: Chairman of the Board of Directors, J. C. Hutchins; Secretary, A. E. Peters; Assistant Secretary, Emma Heise; General Manager, E. J. Burdick; Acting Treasurer, Joseph Bompton. Mr. Burdick was formerly assistant general manager. Mr. Bompton was formerly assistant auditor.

At the adjourned meeting of the new board of directors a committee consisting of Elliott G. Stevenson, J. C. Hutchins, E. J. Burdick, A. Avila Gingras and J. C. Butterworth was named to confer with the city of Detroit relative to the proposition of the city to purchase the company's city lines. This offer was submitted by the Street Railway Commissioner through Mayor Couzens on Tuesday.

At the meeting the old administration was charged with having voted its members excessive salaries and with poor management and poor financing. The report for the year, read by former Vice-President Edwards, was discussed and at several points attacks were made by the spokesman of the Canadian stockholders. In response to the charge of poor financing it was brought out that the company has no outstanding notes, everything having been liquidated. Mr. Hutchins told stockholders that the company is in good financial condition.

At the meeting on Tuesday the mayor proposed paying the company $16,500,000 for its lines within the city, exclusive of real estate. A motion to place the commission's letter on file was voted down. A letter to the company was presented from Ross Schram, assistant general manager of the Municipal Railway. It stated that while the communication was not an ultimatum to the company, it was a notice that the stockholders must appoint a committee to consider immediately the sale of the property or instruct the directors to do so and that failure to act would leave to the city only the alternative of resorting to its legal rights. The commission feels that any further negotiations would be of no avail. The letter was read to the mayor.

The mayor was present at the adjourned meeting and warned the company that it should consider the sum he offered by March 1. He stated that it is an opportunity for the stockholders to get the most they will ever get out of the property. Feb. 21 was suggested by the mayor as the date for further parleys and the stockholders voted to empower the board to negotiate with the city officials on a purchase price for the entire city system to be submitted to the voters for approval. The directors will confer with the city in the meantime and report at the adjourned meeting on Feb. 21.

Bill Introduced in New York to Avert Strikes

Designed to prevent strikes and lockouts harmful to the public interest, the Industrial Relations bill was introduced in the Senate on Feb. 8 by Senator Duell, chairman of the Senate committee on labor, and in the Assembly by Assemblyman Miller of Genesee. It was referred to the committees on labor and industries in both houses and there will be a joint hearing before these committees in March.

The measure as drafted by the New York Board of Trade and Transportation provides for an industrial relations term of the Supreme Court as final arbiter of labor disputes. The Court is empowered under the bill to take over and operate essential industries during emergencies affecting the public welfare arising from violations of the proposed law when such emergencies can not be averted through operation of prohibitory clauses.

United Railways Under Fire

Politicians Become Restive, Attack Receiver and Complain About Fares and Service

After nearly three years of comparative freedom from political attack under the receivership, the United Railways, St. Louis, Mo., came under fire of the Board of Aldermen a few days ago when that body authorized its public utility committee to make a thorough investigation of the railway service. The Council had previously denounced the service by resolution and had held that the 7-cent fare was too high.

Municipal Ownership Advocated

Simultaneously with the attack by the Aldermen, the City Counselor, Henry S. Caulfield, in a speech before a public improvement body, advocated municipal ownership. Incidentally he criticised Rolla Wells, receiver; Col. A. T. Perkins, manager, and Charles W. Bates, general counsel, saying the combined salaries of these three officials, amounting to nearly $100,000 a year, were excessive, and intimating that they were not competent railway men. He said:

> How would you like three politicians, or men not familiar with the subject, to be placed in charge of the Water Works. It is time we quit farming out our utilities.

Although the Aldermen admit they have no control over the affairs of the United Railways except in matters of sanitation, their investigating committee declares it will examine witnesses and submit findings to the Missouri Public Service Commission, hoping to bring out evidence that has not been discovered by the State body in its exhaustive valuation hearing which will be resumed on Feb. 20.

Management Well Fortified

In his reply to the Aldermanic attack, Col. A. T. Perkins, in the absence of the receiver, said the management would be glad to furnish the committee with full data as to matters brought up in the resolutions. The complaints of poor service, he said, were based largely on isolated or infrequent cases. Mr. Perkins said:

> It must be remembered that the rate of fare was reduced (from 8 to 7 cents) in April, 1920, and that it is now below that in most other comparable cities. Any further reduction in fares is now impossible without bringing a serious curtailment and impairment of service, which, on the contrary, the receiver is anxious to extend and improve.
>
> The general service has been steadily and greatly improved during the receivership and is kept to as high an average as the revenue and other means at the command of the receiver allow.
>
> All revenue above that necessary to maintain the property and the service has been expended by the receiver in improvement of the service.

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Injunction Denied Taxpayers

Fourteen Seattle Taxpayers Will Carry Case Against City to the State Supreme Court

The Supreme Court of the State of Washington will now be called upon to adjudicate the powers of the city and the rights of taxpayers in the controversy as to whether taxes may be levied for the support of the municipal street railway. Superior Judge J. T. Ronald has denied the injunction asked by the fourteen taxpayers to prevent the city from invading the general tax fund for the railways, and the attorneys for the taxpayers immediately announced their intention to appeal the question to the Supreme Court of the State, so that that body may interpret the statutes of the state pertaining to the subject.

Decision from Another Source

Almost simultaneously with Judge Ronald's decision, Federal Judge E. E. Cushman in the United States District Court modified the form of decree entered in the Puget Sound Power & Light Company's suit against the city to compel specific performance of the contract of purchase, giving a broader interpretation of the jurisdiction assumed by the federal tribunal over the financial obligations of the street car system. This modification would permit the city to seek a further modification in the future, in event some right or contingency should appear which might require such change, attorneys state.

In dismissing the injunction proceedings of the fourteen taxpayers, Superior Judge Ronald said that the Court was of the opinion that the city did not intend to use taxes previously raised nor to levy additional taxes, and that the gross revenues of the company were sufficient to meet all its obligations.

Judge Ronald also issued a memorandum opinion, setting forth his findings in the case, in which he expressed the belief that the street railway system will pay its own way, that there will be no necessity for a diversion of funds, and that the law will not presume that the City Council will do an unlawful act in the future. In explaining his opinion, Judge Ronald said that without doubt there is now enough money set aside from the revenues of the system to pay the principal and interest accruing March 1, and to reduce the outstanding warrants and place the system on a cash basis by April 1.

Financial Condition Improved

The Judge held that the financial condition of the street railway has greatly improved since the lines were purchased by the city, and that, not taking into account replacements, the city will be able to defray out of the revenues the cost of operation and maintenance and meet the installments of principal and interest, and also to reimburse the various other city departments for services rendered.

If the city should fail to meet the operation and maintenance expense it has, according to Judge Ronald, power to borrow from the general fund or to levy a tax direct, provided the limit of taxation is not exceeded.

Objections to all parts of Judge Cushman's decree were formally filed by the city, and in each case were overruled by the Judge. The objections were based upon the contention that the decree is contrary to equity and good conscience, and because it attempts to settle the rights of the parties concerning matters in respect to which no notice had been served on the city, and that it would impose upon the city obligations which are beyond the city's power and which are prohibited by the constitution and statutes.

Employees' Dividend Plan Proposed

T. E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, has presented a new suggestion for the advancement of the co-operative plan for employees of the company, which will be submitted to the stockholders for approval. President Mitten proposes that co-operating employees receive a co-operative dividend. Under the plan this dividend would be limited to the added net income produced, but it is not to exceed 10 per cent of the payroll of the company. The dividend payment to employees would follow the payment first of the 6 per cent company dividend. In his talk in proposing the plan, Mr. Mitten said:

> This plan will in effect make P. R. T. a stock of preference, the 6 per cent dividend on which is underwritten by men and management, who must reduce 1922 operating costs not less than $1,500,000 in order to make possible a co-operative dividend to employees equaling 10 per cent of the P. R. T. payroll.

Grand Rapids Franchise Under Way

City Attorney Taggart, Grand Rapids, Mich., and Attorney Knappen for the Grand Rapids Railway have started the tentative draft of a franchise that would limit the company's earnings not to exceed 8 per cent. City and company officials have been working together for more than a year on a basis for a franchise.

The proposed franchise must be passed first by the special street railway committee, then by the commission as a whole and last by the electorate before it becomes effective.

It was explained that 8 per cent had been considered because it was justified under present conditions and had been upheld by commissions and courts. In the event of a long-time franchise being granted it would be necessary to allow for a revaluation every five years, said Service Director Wagner, which seemed agreeable to the company. Then, he said, the valuation or the amount on which the company was permitted to earn money could be readjusted to meet changed conditions.

Coupled with this, it was explained that money for thirty years could be obtained at a smaller cost for interest than for a shorter period and that it was customary to grant a franchise for the same length of time bonds were issued.

Fire Wrecks New Orleans Offices

A fire of unknown origin destroyed the upper stories of the four-story building at Baronne and Common Streets, in New Orleans, occupied by the New Orleans Railway & Light Company, as general headquarters. The fire started in the room in which the records were stored, but most of these are said to have been saved. The damage to the building and to fixtures and to stocks of gas and electric light supplies is estimated at $100,000. The company has established temporary headquarters at 421 Baronne Street.

Whether the building can be restored or may have to be condemned is a matter which awaits the report of the Fire Prevention Bureau, now instituting an investigation. The structure has for some time been inadequate to the demands of the company for space, and it is currently reported that those interested are considering building a modern office and salesroom upon the old site in the event that the building is condemned.

$250,000,000 More for New York Subways

Chairman George A. McAneny of the New York Transit Commission discussed the work of the commission at the Feb. 6 lecture of the Industrial Forum which is conducted by the Polytechnic Institute of Brooklyn, N. Y. Within a week or two, he said, the plans would be announced for new subway construction to cost $250,000,000. At the top of the list was the Staten Island tunnel, to connect the Fourth Avenue and Bay Ridge Subway with the Staten Island trolley system. This would cost about $25,000,000. He also hinted at a cross-town subway to connect Long Island City with Borough Hall in Brooklyn.

The money for these new subways will be raised, it is expected, by making such savings in the operation of the present subways that the $264,000,000 of city credit tied up because of constitutional limitations will be released and the city can borrow money for the new subways.

He defended the "barometric" scheme which is part of the plan proposed by the commission for the unification of all New York City transit lines. It would be both an economical and political folly to fix a 5-cent fare indefinitely and this scheme permits changes in the fare after all proper precautions have been taken.

In closing, Mr. McAneny referred to certain "dreams" of those who proposed to pull down all the elevated structures and tear up the surface tracks. It would cost $500,000,000 to buy these old systems and put in anything different and not a single new seat would be added to the city's transit system. The only remedy is the construction of new subway lines, he said.

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Proxies Sought in Philadelphia

Opposing Factions There Said to Be Seeking Alignment for Test of Strength

Financial Philadelphia has a new topic of conversation. It is the question of what is going to happen at the annual meeting of the Philadelphia Rapid Trasit Company on March 15. It will be recalled that some months ago President Thomas E. Mitten announced that he would seek this year a change in the status under which he serves the company. His original contract is said to have run out about a year ago. It is understood that since then he has served without a formal agreement.

The news that Mr. Mitten desired a change created considerable discussion at the time, but as the matter was not to come up for settlement then it lost significance as a piece of news. Discussion of that matter has, however, been provoked anew by the recent plea for support made to the stockholders of the company by a committee of directors composed of Jeremiah J. Sullivan, Charles J. Matthews, William Y. Tripple, Frank Buck and William J. Montgomery, some of whom have been quite outspoken about what they have termed one-man control, reiterated in the newspapers as opposition to domination of the company by Mr. Mitten. A statement which they have issued says:

> Under the existing by-laws of the company the business has been conducted without consultation with board of directors and many important steps have been taken without their previous knowledge. This method of conducting the business of the company is in our opinion, not satisfactory either to the city or to the stockholders, and changes should be made in the by-laws so that the board of directors shall have a real part in the management of its affairs.

Coincident with this movement unusual activity has been noted in the stock of the company, 13,000 shares having changed hands in one day recently with the price pushed up to 24, the highest quotation recorded since 1920.

While there has been no hesitancy to talk on the part of some of the members of the committee seeking proxies, Mr. Mitten has chosen to remain silent. The newspapers have of course been persistent in their quest for news and have filled many columns with stories about the matter, a great deal of it pure conjecture. Of all the statements printed, however, none has, perhaps, attracted greater attention than the following, issued by Drexel & Company in response to repeated demands upon the banking house for a statement:

> Our attention has been called to a contest for control which has arisen between those directors who are known as the stockholders' directors and the management of the company, and this statement is made in response to a question as to what position we occupy with regard to the company and its directorate.
>
> While we have not the slightest personal interest in the result of the contest, nor are we in any sense principals thereof, our sympathies, by reason of our business relationship as bankers, as before stated, are with those directors who are seeking to operate the company under the control of a board of directors rather than with those who are seeking to operate it under what is popularly known as a "one-man control."
>
> Such shares of stock as we ourselves happen to own, or in which we are interested, we would, therefore, vote in favor of Messrs. Montgomery, Buck, Matthews, Sullivan, Tripple and the policies which they represent.

A large stockholder-director is quoted as follows:

> The first intimation the directors had of the employees' profit-sharing plan was when they read it in the newspapers. Mr. Mitten likewise failed to consult the board when he purchased the Burd property for amusement-park purposes. The action of the Board of Directors in seeking proxies against the Mitten management is due to the stockholders' desire for a few dollars in dividends instead of the money all going out for expenses and salaries. The stockholders feel there should be reduced expenses in the management of the company, and that the money should be conserved so as to help pay some interest on their investment.

While all this talk has been going on rumors have been revived about the resumption of dividend payments by the company. It is said that it is proposed to pay a dividend of 3 per cent next July for the period of six months ending June 30, 1922. Since January, 1920, no dividends have been paid. The former yearly rate was 5 per cent.

Would Allow Service-at-Cost Fares

Legislation designed to authorize all cities except New York to enter into service-at-costs contracts with electric railway companies was introduced in both houses of the Legislature on Feb. 3. The bill defined a service-at-cost contract as an agreement between a municipal corporation and an electric railway whereby the fare shall be determined by the actual cost of service, plus a legitimate profit. All such contracts would have to be submitted to the Public Service Commission for approval.

Cleveland Employee Charged with Grand Larceny

Warrants for the arrest of four men were sworn out by the Cleveland (Ohio) Railway during the week ended Jan. 28 in an effort to end thefts that had caused the company hundreds of dollars' loss in the past several weeks.

One of the men arrested on the warrant was charged with grand larceny while three others were charged with receiving stolen property. The arrest of the four, according to company officials, will end thefts that have been going on for some time.

According to company officials, the man charged with the grand larceny was employed by the company. One of his duties consisted of carrying a fare box across one room. While doing this he discovered that the mechanism on the lock was faulty and that he could abstract tickets and cash from the box. Later he turned these over to the three men arrested for receiving stolen property. According to the company it required several weeks of effort on the part of secret service operators in the company's employ to detect the manner in which receipts were being lost.

Another Chicago Proposal Likely

Three lawyers hired by the local transportation committee of the City Council of Chicago, Ill., reported on Feb. 1 that the new ordinance plan outlined by Henry A. Blair president of the Chicago Surface Lines, could not be put into effect without action by the State Legislature. The attorneys gave a further opinion that another plan suggested by Alderman Schwartz could be made effective without any new legislation.

Both these plans have already been mentioned in the ELECTRIC RAILWAY JOURNAL. The Schwartz proposal calls for municipal ownership and operation of surface and elevated railways, the properties to be purchased by a new form of security. Mr. Blair's plan was based on service at cost with a rate of fare to give a 7 per cent return, providing for gradual amortization of the capital value, the city to take over when 50 per cent has been amortized. The special attorneys ruled that the City Council has no authority to guarantee a rate of fare which should provide a certain rate of return. President Blair went to New York after hearing this opinion and promised to make a further announcement in the near future.

Attorneys for the Surface Lines were scheduled to appear before the Illinois Commerce Commission on Feb. 9 at which time the fare case is to be reopened by the commission.

Politics Plays Part in Strike

The strike on the lines of the Virginia Railway & Power Company, Richmond, Va., which went into effect on Jan. 15 has passed from an operating state to a political state. The company has employed a sufficient number of men at the new wage scale and is giving practically normal service. Union men and their families are still forbidden to use the cars and many former electric railway employees still in uniform are operating unregulated and unlicensed jitneys with signs indicating that the fare is whatever one may care to contribute to the welfare of the men out on strike.

The City Council is in a deadlock on the issue of forcing the company to reduce fares from 6 cents to 5 cents. As a reprisal on the part of the city for the refusal of the company to arbitrate as demanded by the city council, the political issues of the strike will be fought out in the council primary of April 3. It is unlikely that any serious jitney regulation or any steps toward a new franchise will be taken before that date.

Per Cent Traffic Decrease Mis-stated—The United Railways, St. Louis, Mo., carried 282,447,190 revenue passengers in 1921 compared with 287,405,837 in 1920. This represents a decrease of 1.73 per cent. In the Jan. 21 issue of the ELECTRIC RAILWAY JOURNAL this per cent of decrease was incorrectly stated.

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New York City Again Allowed Williamsburg Bridge Rights

In deciding that the Legislature has the power to grant to a municipality the right to operate a railroad, the Court of Appeals upholds the right of New York City officials to operate electric railway service across the Williamsburg Bridge. The decision states that no certificate of convenience is necessary, and that the right to operate such a line necessarily includes the right to build a spur to a carhouse, to maintain sidings and switches and to cross over the tracks which form a part of the Brooklyn Rapid Transit lines.

This decision is the latest step in a controversy which has lasted many months. As stated in the ELECTRIC RAILWAY JOURNAL for Dec. 31, 1921, page 1157, the Appellate Division of the Supreme Court, Second Department, denied the city the right to operate without first obtaining a certificate of convenience. This was a reversal of an order of the lower court which granted the city the right to operate cars in competition with the Brooklyn Rapid Transit Company.

Mayor Hylan and Commissioner Whalen have long promised that service over the bridge would be given at a 2-cent fare. Thirteen lines of the Brooklyn Rapid Transit Company operate through cars over the bridge without an additional charge to the regular 5-cent fare. The company also maintains a shuttle service across the bridge for which it charges 2 cents. This company and the Brooklyn City Railroad have definitely announced that they will discontinue their through bridge service when the New York municipal line begins operation.

Federal Judge Mayer recently instructed Lindley M. Garrison, receiver for the Brooklyn Rapid Transit Company, to cease operation of the shuttle service at that time too. Passengers will then have to change from the Brooklyn city cars on the Brooklyn side of the bridge to the shuttle line maintained by New York municipal authorities, pay an additional 2 cents, and on the New York side of the bridge change again to local New York city cars.

Rapid Transit Loop Only Solution to Traffic Problem

The need for and possibilities of a rapid transit system in Cincinnati, Ohio, were described in detail in an address before the City Club by Frank L. Raschig, associate engineer of the Cincinnati Rapid Transit Commission, who declared that the rapid transit loop was the most practical solution of the city's transit problems, both local and interurban. He said that the topographic conditions of Cincinnati and its environs seemed at first to present a problem much more difficult of solution than would have been the case in more level cities, but these very difficulties have presented a natural plan which would give at once excellent interurban and suburban rapid transit facilities.

In discussing the cost Mr. Raschig said that the estimated cost of the loop with 1915 prices was $6,000,000 and that was the amount authorized by vote of the people in 1916. Unfortunately, the war intervened and the work was not started until late in 1919. To build the complete loop as planned at present prices probably would take $11,000,000 and it would be necessary to go to the people for an additional bond issue. This cost is complete for operation, not, however, including rolling stock and provision for power. He added that rolling stock could be purchased out of operating receipts extending over a number of years and power purchased from the Union Gas & Electric Company, doing away with the necessity of separate power houses.

Power Program Under Consideration

The West Penn Power Company has applied at Morgantown, W. Va., for permission from the county court to construct power lines through Union district. It has also made a similar request in Preston county and has sought permission from the State Road Commission whereby it will be possible to cross public highways.

It is understood that the line is to run from the West Virginia state line via Chest Haven, Beaver Hole, Masontown, Kingwood and then on to Tunnelton and Rowlesburg. This route has been outlined to the State Road Commission.

Bold "Nickel" Snatcher Serving Two Years in Jail

Although union carmen (Amalgamated) made a hard fight to save him and are now seeking a parole, Harry J. Julin, former conductor employed by the United Railways, St. Louis, Mo., is serving a two-year sentence in the Missouri penitentiary at Jefferson City for the theft of $97.78 in fares. It is the first case of the kind that has ever gone to the Supreme Court. The verdict of the lower court was affirmed last November. Julin was one of the boldest car fare robbers among about 200 who have been discharged by the receiver in the last two and a half years. An example was made in his case. A dozen auditors worked up the evidence which showed that he filed down 7-cent tokens so that they would register as pennies, and filed-off nickels and dimes also to register as pennies. In a number of instances, the testimony showed, he held his hand over the fare box to prevent the passenger from depositing the fare, pocketing it himself.

One auditor after another, men and women, were assigned to the Julin case, and it required months of work to accumulate the evidence of the total thefts of $97.78. Notwithstanding a bitter fight by the conductor's union associates the jury returned a verdict of guilty and the Supreme Court upheld the verdict of the trial court.

News Notes

Service to Be Resumed.—The Public Service Railway, Newark, N. J., has informed the Board of Aldermen of Elizabeth, N. J., that cars will again be placed in service on the Fifth Street line. The traction company abandoned service on this line some time ago and is waiting for special work to be made.

Ask Commission to Explain Methods.—A resolution has been presented to the New Jersey Legislature requesting the Public Utility Commission to furnish the Assembly with data showing the commission's method of fixing rates, the percentage of the income consumed by state and municipal taxes, the percentage of income consumed for federal taxes and the percentage of operating cost to the revenues received from 1914 to date.

Maine Road Cuts Wages.—A flat wage reduction of 10 per cent on the Atlantic Shore Line in Maine, to go into effect on Jan. 31, has been announced by S. T. Dow, general manager of the company. About seventy-five employees will be effected. In Biddeford, Kennebunk and Sanford zones the fares will be cut from 10 cents to 5 cents on Feb. 11. One-man cars will be introduced between Sanford and Springvale and may be extended eventually to the entire system.

Proposed Electric Line Abandoned.—Negotiations for the construction of an electric railway over the right-of-way of the Buffalo & Susquehanna Railroad, service on which has been discontinued for some time, have according to C. A. Finnegan of Buffalo, N. Y., owner of the right-of-way, been abandoned. Lack of interest displayed by the residents along the way was his reason for abandoning the project. The road was purchased by Mr. Finnegan during the war from the Goodyear interests. It is still hoped by some that the road will be electrified.

Old Wage Schedule Ordered to Be Continued.—In a majority report submitted to the Department of Labor at Ottawa, Ont., the board of conciliation, which investigated the wage dispute between the Hull Electric Railway and its employees, has recommended that the wages continue as set forth in the award of the board of conciliation, dated Aug. 26, 1920, which was accepted by both the employing company and the employees. The judgment of Aug. 26, 1920, placed the wages at from 40 to 60 cents an hour, according to the class and length of service of the particular employee. At the hearing of the present board the employees complained that the company had violated the statute by reducing wages "after a dispute had arisen and before a pronouncement thereon by this board.

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Financial and Corporate

$5,043,471 Plowed Back

Railway and Light Company at Columbus, Ohio, Returns This Sum to Capital in Three Years

All members of the board of directors of the Columbus Railway, Power & Light Company, Columbus, Ohio, were re-elected by unanimous voice at the recent annual meeting. One of the surprises of the meeting was that all the proxies held by W. A. Gill, Columbus, one of the staunchest supporters of the former management, were cast for the re-election of the directors. These last are: Charles L. Kurtz, Norman McD. Crawford, D. Meade Massie, Emil Kiesewetter, Clarence C. Slater, Walter B. Beebe, William C. Willard, A. S. Hammond, Harry S. Holton, William A. Gill, Ben W. Marr, Eugene A. Reed, Frank L. Stein and James B. Hanna.

Action on the part of the officers in preparation for the extension of railway service to the northern suburb of Clintonville was approved, a resolution also being adopted authorizing and approving a contract entered into on Jan. 6, giving the Columbus, Delaware & Marion Electric Company the right to use the rail-light tracks on Indianola Avenue on the North Side to Town and Third Streets, in the main business section.

FINANCIAL CONDITION IMPROVING

A constantly improving financial condition is reflected in the report submitted at the meeting by President Kurtz, in which formal announcement was made that the board of directors plans to resume payment of dividends, if approved by stockholders at a special meeting scheduled for Feb. 21.

President Kurtz said:

> The slow but sure upbuilding of the property, service and income tended to increase the company's credit until it was possible to secure a $3,000,000 three-year, 8 per cent underwriting or financing the first of June; and so, in this way the large note issue was absorbed and the seeming last financial danger so long threatening disaster was averted. It was the great amount of these notes, so many times renewed without a single payment made thereon, that required a sinking fund, into which all net earnings above operating needs, interest and depreciation had to be deposited, that operated to defer the resumption of dividends to stockholders.
>
> The continued, sure and steady restoration and upbuilding of your properties with corresponding increase in both service and income have naturally given to the company a better standing and credit at home and abroad.

The report shows that during the past three years $5,043,471 was invested in improving and enlarging the various branches of the service. The company has purchased 6 miles of track of the Columbus, New Albany & Johnstown line, contracted to purchase more than 6 miles of track from the Columbus, Delaware & Marion line; spent $995,705 for new track construction, special track work and moving poles, spent $611,427.61 in building a new conduit system to comply with an order of council, increased the capacity of the Big Walnut power plant; built and rebuilt substations, and extended transmission lines at a total cost for these alone of $3,436,338.

American Bankers Finance Paris Municipal Railway Undertaking

Kuhn, Loeb & Company, New York, N. Y., headed a syndicate which offered for subscription recently $25,000,000 of Department of the Seine (France) twenty-year 7 per cent external gold bonds, due Jan. 1, 1942. The bonds were offered at 90½ per cent of par. The department of the Seine is by far the greatest in wealth and population of the eighty-nine departments into which France is divided. It comprises the city of Paris and its residential and industrial suburbs. The present loan and a sterling loan to the amount of $12,500,000 are being contracted to provide funds for capital expenditures for the betterment and extension of the newly acquired transportation system. The bankers explain that the proceeds will be used entirely for productive purposes.

$500 a Day Gain in Toledo Receipts

The report of operation of the Community Traction Company, Toledo, Ohio, for the month of December was one of the best that has been made to the Street Railway Board of Control by Commissioner Wilfred E. Cann. Following the presentation of the report Mr. Cann announced that the order of Safety Director Gilson D. Light barring buses from downtown routes would probably increase the revenues of the railway by nearly $20,000 a month.

Although the first few days of december showed an average gain in receipts of approximately $700 a day, the average for the entire month ran about $500 over the previous month's average daily business.

A large part of the increased revenue will go into the fare stabilizing fund and help eventually to decrease the fare. The commissioner believes that a reduction in fare may become possible some time during the summer if conditions continue as at present. A swift betterment of industrial conditions would of course serve to hasten the fare reduction.

Since the buses have been ruled out of the congested traffic district, extra trippers have been put into service by the Community Traction Company and the operation of several car lines has been readjusted.

The first year of operation under the service-at-cost plan ended on Feb. 1.

Indiana Merger Approved

Commission Authorizes New Corporation to Issue $17,496,000 in Securities for Purchase of Properties.

The Indiana Electric Corporation, a merger company of seven electric utilities of the State, was authorized on Jan. 26 by the Public Service Commission to issue $17,496,000 in securities to purchase properties connected with the deal.

The action of the commission constitutes approval of the merger plan and financial transactions outlined by the company as incident to the proposed merger.

RAILWAY AND POWER COMPANIES INCLUDED

Companies which will enter into the merger, under the order of approval, as previously stated in the ELECTRIC RAILWAY JOURNAL, are the Merchants Heat & Light Company, Indianapolis; Elkhart Gas & Fuel Company, Valparaiso Lighting Company, Indiana Railways & Light Company, Kokomo; Wabash Valley Electric Company and Cayuga Electric Company. The first three companies are already owned by the corporation.

The Joseph R. Brewer interests are behind the merger. The petition of the company, which asked for approval of securities amounting to $18,496,000, was the second to come before the commission. A previous petition, asking approval of the issuance of $21,000,000 in securities, was denied by the commission.

Commissioner George Barnard, who presided at the hearings and who wrote the order refusing to grant the first petition, dissented from the order of the commission approving the merger. Commissioner Barnard prepared a tentative order disapproving the plan for a second time, but the order was not approved by the commission. The other commissioners then wrote the order which was issued.

The $17,496,000 in securities authorized by the commission is distributed as follows: Bonds, $13,296,00; notes, $700,000; preferred stock, $1,500,000, and common stock, $2,000,000. A total of $2,250,000 of the bonds is to be refunded by the sale of preferred stock. The value of the properties, as found for the purpose of purchase and sale, is $17,500,000. This valuation includes physical property, $16,000,000; working capital $600,000, and going value, $900,000.

VALUE NOT FOR RATE MAKING

Members of the commission said it is stipulated that the values found in the order are not to be considered in any rate case.

The commission announced that a central power plant of the company is to be erected in the coal fields along the Wabash River.

Action by the commission on the original application was reviewed in the ELECTRIC RAILWAY JOURNAL at the time the decision was rendered.

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Toronto Hearings Postponed

Deficit of Ten-Year Operation of 22.5 Mile Municipal Lines Shown to Be $1,420,000

The Toronto Railway Arbitration Board, after sixty-four days of hearings, from Sept. 12, 1921, to Jan. 27, 1922, adjourned until March 14 at the request of the city of Toronto in order to give the city time to complete the preparation of its case.

On the sixty-fourth day of the arbitration Mr. Drum of A. L. Drum & Company, consulting engineers, Chicago, completed his testimony with respect to the going concern value of the property of the Toronto Railway. He contended that $1,558,574 was a fair amount to represent the going concern value, basing his estimate on the cost of bringing the property to the status of an efficient operating concern.

The evidence presented introduced a new element in valuation cases, as proof was offered that the tracks and equipment of the Toronto company were suitable, adequate, efficient and economical of operation; that all of the seventeen car routes but one in the city were properly located and efficiently operated and that each of these routes not only afforded proper and adequate service through the territory it served but was profitable and economical as indicated by the number of cars operated, schedule speeds and passengers carried.

Mr. Drum said it was unusual to find in a city of 500,000 population only one route out of a total of seventeen that was unprofitable, particularly as this one route involved only three cars out of a total of 663 cars operated by the company and included less than 0.4 per cent of the total car miles. Among the data submitted in support of this argument was the complete detail of the operating statistics of the routes for eight months ended Aug. 31, 1921, a condensed table of which is published herewith.

It was further contended that the Toronto Railway, as acquired by the city of Toronto, was a very profitable going street railway system and the owners of the property were entitled to a substantial allowance for the cost of bringing the property up to its present efficient state of operation. In support of this claim Mr. Drum submitted an analysis of the results of operation for the eight-year period 1913 to 1920 and reduced to a unit basis for comparison with results found in eight cities in the United States having about the same population as Toronto. These data are published herewith.

To illustrate the loss during the development period of a street railway system and to show the benefit to Toronto of unification of the municipally built lines in Toronto with the Toronto Railway system (now a part of the municipally owned lines) Mr. Drum submitted an exhibit showing the operating deficits by years covering the entire period of operation of the Toronto Civic Railway (the system built by the city) up to Aug. 31, 1921, the time the city took over the property of the private company. A summary of this exhibit, published herewith, shows that the municipal system has never earned interest on the investment in any year, and that the total deficit from operation during the ten-year period of its operation has been $1,420,084.

OPERATING STATEMENT OF THE TORONTO CIVIC RAILWAY FOR THE CALENDAR YEARS 1911 TO 1921 INCLUSIVE

Year	Bonds Outstanding at End of Each Year	Gross Revenue from Operations	Operating Expenses	Net Earnings from Operations	Interest and Sinking Fund	Net Deficit
1911 (Six months)	$1,157,293	.....	.....	.....	$39,017	$39,017
1912	1,296,781	$1,073	$557	$516	87,611	87,095
1913	1,486,603	59,557	56,608	2,949	98,297	95,348
1914	1,552,091	167,000	161,993	5,007	100,338	95,331
1915	2,116,748	199,289	202,663	†3,374	142,647	146,021
1916	2,116,748	224,994	194,302	30,692	146,988	116,296
1917	2,412,478	278,346	252,511	25,835	160,579	134,744
1918	2,422,748	333,882	297,879	36,003	171,327	135,324
1919	2,626,748	443,575	397,632	45,943	181,569	135,626
1920	2,626,748	543,571	551,658	†8,087	200,129	208,216
1921 (Eight months)	2,626,748	397,720	491,484*	†93,764	133,302	227,066
Total	.....	$2,649,007	$2,607,287	$41,720	$1,461,804	$1,420,084

* No taxes included in operating expenses except for the eight months 1921, which includes $10,073 taxes on carhouse. † Loss.

$100,000 Involved in Tax Levy Suit

A hearing has been granted by the State Supreme Court of Washington of the case of the city of Seattle and the Puget Sound Traction, Light & Power Company against the state, in which the plaintiffs are seeking to secure cancellation of a $400,000 tax assessment against the railway lines. The case has been put down to be heard at the May term.

The assessment was made on March 15, 1919, fifteen days before the city took over the railway lines, and was invalidly levied, it is contended by the city and traction company. It is customary to levy taxes for the following year in June, while in this case, it is contended the date was advanced to March, because the city was to take over the lines on the last of the month.

In the event that the tax is held valid, the traction company's share will be $100,000. Had the tax been assessed at the usual time of the year, the following June, there would have been no assessment against the city, as the municipally-owned lines were not subject to taxation, it is contended

The King County Superior Court sustained the validity of the levy, and an appeal was taken to the Supreme Court.

OPERATING STATISTICS OF THE TORONTO RAILWAY

Results of Operation for the Eight-year Period 1913 to 1920 Reduced to a Unit Basis for Comparing Results in Toronto with Results Found in Eight Cities in the United States of About the Same Population.

	Population per Square Mile 1920	Revenue Passengers per Mile of Single Track	Revenue Passengers per Car Mile	Maintenance of Way and Structures per Mile of Single Track	Maintenance of Equipment per Car Owned	Kw.-Hr. per Passenger Including Transfer
Toronto	16,786	1,184,077	7.74	$1,312	$637	0.296
Minneapolis	7,650	593,320	6.99	1,182	452	0.443
St. Paul	4,437	459,596	6.23	1,269	566	0.574
Cleveland	14,219	715,813	8.84	* 3,317	747	0.355
Kansas City	5,729	426,371	5.26	* 2,179	705	0.610
Cincinnati	5,639	462,846	5.30	1,394	391	0.352
Buffalo	13,004	326,066	5.99	1,634	582	.....
Baltimore	9,289	513,228	6.48	1,376	302	.....
St. Louis	11,851	545,688	5.75	1,679	685	.....
Average	9,845	580,778	6.51	$1,705	$563	0.439
Average, excluding Kansas City and Cleveland				$1,406	$516	

* Includes allowance for renewals and replacements.

OPERATING STATISTICS OF THE TORONTO RAILWAY BY ROUTES FOR THE EIGHT MONTHS ENDED AUG. 31, 1921

	Name of Route	Maximum Number of Cars Operated	Revenue Passengers	Car Miles	Maximum per Hour Running Time	Passengers per Car Mile
1	Avenue Road	33	6,524,561	595,401	8.28	10.958
2	Ashbridges Bay Route	3	94,743	55,328	9.60	1.712
3	Bathurst	38	6,318,451	898,765	8.85	7.030
4	Bloor	49	8,531,992	915,581	9.28	9.138
5	Broadview	33	6,714,156	616,678	9.03	10.884
6	Carlton	40	9,098,638	1,086,183	9.62	8.375
7	Church	18	2,871,545	367,307	8.20	7.817
8	College	42	6,907,031	793,585	9.50	8.703
9	Dovercourt	18	2,914,815	382,672	9.11	7.613
10	Dundas	45	12,833,504	1,201,756	9.37	10.671
11	Dupont	18	2,926,234	380,360	8.45	7.693
12	Harbord	43	6,094,371	885,549	9.74	6.882
13	King	102	17,775,377	2,666,690	10.20	6.666
14	Queen	86	20,727,244	2,068,834	9.28	10.018
15	Belt Line-Sherbourne	17	7,166,223	973,554	8.82	7.361
	Belt Line-Spadia	22			8.82	7.361
16	Winchester	12	1,953,115	230,563	8.46	8.471
17	Yonge	44	11,566,720	894,604	7.95	.918
	Total	663	131,018,720	15,013,410		
	Average	37	7,278,817	834,078	9.03	8.727

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$128,946 Loss in Cleveland

This Is on Basis of Ordinance Allowance—Actual Surplus Was $600,158

The Cleveland (Ohio) Railway finished 1921 with an actual surplus of $600,158 although on the basis of its service-at-cost ordinance allowances there is shown a deficit of $128,946 for the year. That is just one high light shown in the company's annual report submitted to its stockholders at the annual meeting on Jan. 25. The difference between the ordinance deficit and the actual surplus is represented mostly in the big saving affected by the company in its operating allowance, due to wage and salary reductions and other economies.

Although the company's riders during 1921 show a falling off of 11.42 per cent as compared with the year previous, still the passenger revenue showed an increase of 1.47 per cent, due largely to the fact that the company operated at the maximum rate of fare—6 cents, plus 1 cent for a transfer—during the entire year of 1921 while in 1920 it had this maximum in effect for only one-half year.

The number of riders for 1921 totaled 399,429,666 as compared with 450,925,677 for 1920. Passenger revenue in 1921 amounted to $17,277,266 as against $17,027,522 for 1920. The number of car miles run in 1921 was 35,283,902 as against 38,774,682 the year previous. The company's total gross income in 1921 was $17,797,947, while its actual expenditures amounted to $17,197,788.

$2,100,731 TO STOCK AND BONDHOLDERS

For injures and damages in 1920 the company paid out the sum of $1,216,948, while for taxes the company's total was $1,181,143, which is an increase of 9.14 per cent over the year previous.

As the amount of money paid the stock and bondholders in the company totaled for the year $2,100,731, it can be seen that the taxing bodies and the claimants for injuries and damages received more money than the people who, by the investment of their money, made the railway possible.

In his annual report to the stockholders John J. Stanley, president of the company, pointed out that during 1921 there were no additions to the company's rolling stock and that no betterments were made during the year "save those involving so small an expenditure of capital that they could be paid for with the money realized from retirement of obsolete property, or in two instances, paid for by private individuals interested in having them made." He also pointed out that wages and salaries of employees were reduced 10 per cent during the year while there was substantially a 20 per cent decrease in the wage scale for conductors and motormen.

Salient paragraphs from Mr. Stanley's report follow:

The fare was at the maximum throughout the year. We earned expenses, taxes and interest. The number of passengers decreased greatly, but the city lessened the service and we were able to give the service demanded without suffering loss.

The decrease in riders was continuous throughout the year, in January slightly more than 4 per cent and in December nearly 9 per cent, but it was apparently checked during September, close analysis of the figures showing that while the decrease continued it was at a less alarming rate.

Mr. Stanley explained that the city was loath to believe that this decrease in riding was permanent, and it was not until May that its service demands were appreciably less than in the year previous. But from that time on, the service was adjusted rapidly to the lessened demand; so that, despite the large decrease in the number of riders the company was enabled to complete the year with an actual profit and but a small deficit in the ordinance allowances. He says:

Our operations for the year from an operating standpoint were satisfactory. The service given was the best possible at the costs we had to meet; we maintained the property; and, when the final adjustment of accounts is made at the end of the ordinance year, Feb. 28 next, it will be found that we lived within our income.

But from the standpoint of growth, of continued development of the property, of anticipating and equipping ourselves for the demands of next year's car-rider, the giving of "the best street railway transportation at cost," we suffered a real loss. The failure in 1920 of the effort to make our stock salable at par by increasing the interest rate to 7 per cent, as provided in the amendment adopted by the Council and rejected at the referendum election on Aug. 10 of that year, together with the offering on the market of equally sound securities bearing a larger rate of return than 6 per cent, has made the financing of any extensions or betterments under the limitations of our franchise impossible. And those limitations remain.

Mr. Stanley next said that the amounts paid by the company to the federal government in taxes on its income have been so large since 1917 as to raise the question whether or not the company should not be exempt, because of the peculiar conditions under which it operates, from the appliance of the same rule to it as is applied to every other corporation. He says that late in the year, through the interest of the city street railroad commissioner, the company received authority from the city to present the matter to the proper department of the federal government to the end that a refund of all or part of the sums paid be had and relief granted as to future levies. Steps are being taken to secure a hearing. In continuing he said:

While the cost of accidents was less than the cost in 1920, it was so large that we have consolidated in one department all of our efforts to eliminate the causes of accidents. The company is hopeful, on the showing made in the last few weeks that the coming year will be a safer and less expensive year than any of recent times.

The number of riders carried daily is still many thousands less than the high average set in 1920, but the closing months of the year seem to indicate a gradual, though slow, return to the old traffic demand. If, as we all hope, this continues, the present rate of fare, with the present service and costs, will be sufficient for our needs the coming year. But should there come a second and greater decrease in the number of passengers, it will be followed by a lessened service. This year's experience justifies confidence for the future.

A new Mayor and City Council are in office. The added pressure for extensions and betterments which the passing of another year, in which no real additions were made, should lead them to the early solution of the problem—how to enable us to obtain funds to pay for the city's transportation needs. Until the problem is solved, the policy which we were of necessity forced to adopt a year ago must be adhered to. I repeat what I then said:

"Because of lack of funds that we may use on capital accounts, it is necessary, in our own interest, to cease altogether the spending of money for additional property, even such as ought really to be regarded as essential to the conduct of our business.

"This, then, is the policy of your directors under present financial conditions. It is with regret that I announce this policy, because Cleveland needs extensions and betterments of its street-railway system. The growth of the city in population and area and the increase in the business of the company will not be as great in percentages as in some past years, but Cleveland will continue to grow and people will continue to ride on the street-cars in larger numbers. This growth ought to be met by service adequate to take care of it, and greater service calls for more tracks, rolling stock, buildings and power."

$1,000,000 of Stock Offered

Public of Portland, Ore., Invited to Participate in Ownership of Local Utility

One million dollars of 7 per cent prior preferred stock is being offered for subscription to customers and patrons by the Portland Railway, Light & Power Company, Portland, Ore. The purpose of the issue is to provide funds to carry out extensions and improvements included in the budget of the company to be made in 1922.

About a year ago the company offered for sale to home investors an issue of gold notes which was very quickly oversubscribed. As in the case of that issue, the advertising now being done in offering the stock for subscription is under the direction of W. P. Strandborg, publicity manager for the company.

For four days before the issue was advertised publicly it was brought to the attention of the employees, with the result that in these four days 1,100 employees subscribed for 1,737 shares wih a par value of $173,700. This notable achievement proved of great pulling power in connection with advertisjng the issue to the public. After noting the very favorable response of its own employees to the offering an advertisement of the company said:

These 1,100 men and women—our employees—who have made this choice of an investment, are your friends and neighbors; you see and meet them every day; working loyally for their company on the cars, in our general offices, in our power plants, stations, in and around the scores of departments that make up this great utility.

They are just like you; they know the value of thrift; they are on the lookout for a good, safe, income-bearing investment and they know a good one when they see it. Just as you do.

That's why they selected our 7 per cent prior preference stock.

That is why we say, if it is a good investment for our employees—it is equally good for you, our customers and patrons.

Shares of this stock may be purchased either for cash or on the easy-payment plan, at 96 to yield 7.3 per cent, dividends payable quarterly.

It is important to state, also, that this stock is superior both as to assets and earning power over all stock, both preferred and common, now outstanding.

Moreover, it is an investment at home for our home people, so you can easily investigate what is behind the investment and your money will be put to work for you where you can watch it grow.

A very desirable and attractive feature of the easy-payment plan is that we pay 7 per cent interest on all partial payments from the time these payments are made until your contract is completed.

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Boston "L" Wants Its Bonds Made Legal for Savings Investments

The Boston (Mass.) Elevated Railway has asked the Massachusetts Legislature to make its bonds legal investment for the savings banks. They do not come within that classification at present because the law requires that in order to qualify there must have been a dividend payment of 5 per cent for at least five successive years.

The matter came up for a hearing during the week ended Jan. 28 before the legislative committee on banks and banking. James F. Jackson, chairman of the Boston Elevated board of trustees, told the committee that the elevated bonds should be considered safe for savings banks investment on account of the State guarantee of interest under the public control act.

Chairman Jackson told the committee that the company must have a large amount of money for new car shops and equipments to improve the service. It has bought the sites for car shops and needs $3,000,000 to erect and equip the buildings. It could save $350,000 by doing this work now. Its present equipment belongs to the days of horse cars.

If the bill which is before the Legislature were passed it would be possible for the Elevated to raise the new money it needs, said Mr. Jackson. He said that he believes the savings banks would invest in the new securities, because they are perfectly good with the State guarantees.

Aids Employees in Buying Stock

Employees of the Southern Pacific Company and proprietary companies, including the Pacific Electric Company, Los Angeles, Cal., whose lines form a part of the Southern Pacific transportation system, beginning Feb. 1, were afforded the opportunity to buy shares of the capital stock of the company on easy terms, according to a statement to employees issued by William Sproule, president of the company.

The plan provides that on application of the employee, the company will buy from one to fifteen shares of stock in the open market, deducting the purchase cost in small amounts from his monthly pay.

The company has no stock in its treasury. All of its stock is in the hands of the public (about 54,000 holders) and the present proposal is intended to make it easy for employees to buy Southern Pacific stock in the open market. The company, of course, cannot control the future market price of the stock or the amount it will be able to pay in dividends, as earnings largely determine that, it is stated.

The company will charge the employee 6 per cent interest on the cost of stock purchased for his account and will credit him with dividends paid on the shares held for him. Dividends have been paid regularly since June 30, 1907, at the rate of $1.50 a quarter or $6 a share annually at the market price of the stock, at present approximately $81.50. This rate of dividend gives a return of not quite 7½ per cent on the investment. Thus dividends will more than offset charges made for interest.

2 per Cent Additional on Extended B. R. T. Notes

The New York Transit Commission has approved the application of Receiver Garrison for an extension of the $16,000,000 receivers' certificates of Brooklyn Rapid Transit Company for one year, from Feb. 1, 1922, to Feb. 1, 1923. The interest rate will be increased from 6 to 8 per cent. In handing down its decision the commissioner said:

> In view of the losses incurred and sacrifices made by holders of traction securities and employees and the reduction of this debt by $4,000,000 and the general decrease in the cost of money, it is the very strong view of the commission that a 1 per cent discount should have been accepted as a maximum to be paid for the extension. The failure of the commission's efforts to secure such a concession indicated, however, that the court had already exhausted the possibilities of reducing the syndicate's demands.
>
> The commission is, therefore, faced with the alternative of approving the extension terms as presented or of disapproving them and thus subjecting to sale the transit properties covered by the lien of the certificates. Actually there would appear to be no alternative. A sale of these properties and further disintegration of the Brooklyn Rapid Transit system at this time would be a calamity.
>
> The existing situation must be preserved pending the working out of the commission's plans for the readjustment of transit. Therefore, despite its belief that the terms of the extension are excessive, the commission feels compelled in the public interest to recognize them as the price of keeping the system intact.
>
> The extension is, therefore, approved.

Operating Revenue Decreases $377,000—Expenses Go Down $100,000

A reduction of $377,000 in operating revenue, as against a decrease of only about $100,000 in operating expenses, is the summary, given by President Clark V. Wood of the affairs of the Springfield (Mass.) Street Railway in 1921. As against nearly 55,000,000 passengers carried in 1920, only 49,000,000 were carried in 1921. Reduction of traffic in the rush hours, due to industrial slackness, is found to be a large factor in the decline. While there was a saving in the use of power, because of lighter hauls and the introduction of many one-man cars, it was necessary to put $155,000 into car maintenance, outside of $119,000 spent for electrical equipment. Principal items in round numbers in 1921 were: operating revenue, $3,428,000; operating expenses, minus interest on funded and unfunded debts, $2,900,000; kilowatt-hours, 25,500,000; passenger car miles, 7,000,000; transfer passengers, 5,700,000.

Dividends paid by the Springfield Street Railway in the year amounted to 3 per cent. The Springfield Railway Companies, the holding company, declared a dividend of 4 per cent on preferred stock. The New England Investment & Security Company, having holdings in this and other Massachusetts companies, also declared a dividend of 4 per cent.

There is no immediate prospect of a reduction of fares, which now stand at 7 cents, but President Wood says that as soon as receipts are sufficient to pay expenses and give a fair return on the investment service will be improved, road improvements instituted and fares lowered.

Preferred Stockholders Enter Protest

The organization of a committee, representing the preferred stockholders of the American Cities Company, many of whom live in New Orleans, was effected on Feb. 4, according to an announcement in the local paper. Samuel A. Trufant, a local investment broker, has been elected chairman.

The movement appears to portend a conflict of interests between the preferred stockholders and the bondholders of the company, at the approaching sale, on Feb. 23 of all the securities in the six Southern utility companies controlled by the American Cities Company. Mr. Trufant makes a strong protest against the plan proposed by the bondholders for the reorganization of the company.

The statement made by Mr. Trufant was in part as follows:

> In a word, the bondholders' plan amounts to a practical "freezeout" of the preferred stockholders and unless some concerted action is taken in their behalf to prevent the proposed reorganization the preferred stock will represent only an unpleasant memory in this community.
>
> If any plan of reorganization is proposed whereby the equity of the preferred stockholders in the assets is given fair consideration, I feel sure that the large majority of the holders of the preferred stock, of which there is $20,500,000 outstanding as against $7,500,000 of the bonds, would be quite willing to co-operate.

The bondholders' committee a week ago announced that holders of preferred stock in the American Cities Company would be offered "the right to subscribe to a certain amount of income bonds and common stock of the National Power & Light Company," the successor company.

The general plan for the reorganization of the company has been reviewed previously in the ELECTRIC RAILWAY JOURNAL.

Decrease in Expenses in Seattle

In its report of operations for November, 1921, the Seattle (Wash.) Municipal Railways shows a decrease in its total expenses of $27,751 over the same month in 1920. For November, 1921, the expenses were $348,590 against $376,341 in November, 1920, the total revenue increased from $472,955 in November, 1920, to $525,040 in November, 1921.

Mr. Nash an Omaha Director.—L. C. Nash has been elected director of the Omaha & Council Bluffs Street Railway, Omaha, Neb. He is president of one of Omaha's leading mercantile establishments.

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Financial News Notes

Kalida Mayor Wants Line Operated.—Mayor S. H. Stevens of Kalida, Ohio, has filed a motion in federal court at Toledo for a rehearing of the petition of the receiver for the Indiana, Columbus & Eastern Traction Company to abandon service on the Defiance and lower divisions of the road. He claims it will leave Kalida without any form of transportation.

Common Stock Dividend Declared.—The Twin City Rapid Transit Company, Minneapolis, Minn., has announced the declaration of a dividend of 2 per cent on the common stock for 1921, payable on Feb. 10, to stock of record Feb. 3. In 1921 the company paid 3 per cent and in 1920 2½ per cent. Formerly the company paid a quarterly dividend of 1¼ per cent.

Seeks Temporary Suspension.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., has petitioned the State Railroad Commission for permission to suspend operation on its San Pablo Avenue line in Richmond. The request is made for ten years. Recently the commission permitted a suspension of service on part of this company's system at El Cerrito.

Receiver Appointed.—J. L. Brassell has been appointed receiver of the Fairburn & Atlanta Railway & Electric Company, Fairburn, Ga., upon a bill in equity presented by the trustee of the bonds issued by the company. The bill states that on Jan. 1. payment of principal was not made on bonds amounting to $42,000, which had been issued five years ago and matured on Jan. 1. The line operates between Fairburn, Union City, Red Oak and College Park.

Municipal Shuttle Line Discontinued.—Because of the small receipts one municipal car line at Detroit, Mich., has been forced to discontinue its service. The line, which connected the Twelfth Avenue city line with Livernois Avenue, has been operating with two cars. The daily receipts have averaged about $4. About 1¼ miles of double track are involved in the line discontinued. The line was operated as a shuttle in connection with joint operation on the Trumbull line.

Walla Walla Lines Reported Sold.—The Walla Walla (Wash.) Traction Company, a subsidiary of the Pacific Power & Light Company, is reported to have sold its 27 mile interurban electric railway system to the Northwestern Improvement company, a subsidiary of the Northern Pacific Railway. The electric railway lines purchased cover the city of Walla Walla, with a main line running to Milton and Freewater and a few short branches into orchard districts. The consideration paid and terms of payment were not announced.

Third Rail Line Sale on March 16.—March 16 is the date finally set for the sale of the third-rail division of the Aurora, Elgin & Chicago Railroad, Aurora, Ill., necessitated by the petition filed by the Northern Trust Company, Chicago. If the highest bid received is not sufficient to cover the amount required, the balance will be cared for by attaching a lien on the Fox River, Elgin & Aurora city lines. This provision was made by the court in arranging for the sale, which is to be held at Wheaton.

Maine Company Doing Better.—The gross income of the Cumberland County Power & Light Company, Portland, Me., for the year ended Dec. 31, 1921, was $3,305,110, compared with $3,114,008 for the previous year. The net income for the year was $364,399, as compared with $303,691. In 1921 preferred stock dividends were $241,500 while no such payment was made in 1920. The surplus for 1921 was $122,899, as compared with $303,691 the previous year. The Portland Railroad, operated by the company, was operated at a deficit of $62,796 in 1921, compared with a deficit of $120,711 the previous year, after the payment in each year of $99,950 in dividends.

1,732,887 More Passengers in Vancouver.—The British Columbia Electric Railway, Vancouver, B. C., carried during 1921 1,732,887 more passengers on all lines than during 1920, the figures being 70,883,992 for 1921 compared with 69,141,105 in 1920. The city systems of Vancouver, Victoria, New Westminster and North Vancouver and interurban lines are included. Up to August, 1921, there was an increase in traffic on practically all lines, but since that time a falling off has been registered due to a number of industries being shut down. The system is running from 100,000 to 200,000 passengers a month behind last year.

$220,016 Accumulated Deficit for Municipal Line.—The Tacoma (Wash.) Municipal Street Railway accumulated during 1921 a larger deficit than in any year of its history, although the month of December showed an improvement, according to a report of City Comptroller John M. Roberts. During 1921 the deficit, including interest, depreciation and other charges, was $59,648, bringing the total deficit of the utility since its inception to $220,016. December came within $336 of paying the operating expenses alone, but the total deficit for the month was $3,654. The number of passengers carried in 1921 was only a little more than half the number during 1920, when 4,030,759 were carried.

Appeal Made for Approval of $922,000 Issue.—Attorney Philip G. Carleton for the Eastern Massachusetts Street Railway, Boston, Mass., has asked the commissioners of the Department of Public Utilities to approve the proposed issuance by the public trustees of the company of $922,000 in bonds to redeem obligations incurred by the company under the reorganization act of 1918, in extensions and additions to its property. Attorney Carleton also asked the commissioners to certify that the proceeds of the $2,000,000 in bonds authorized under the organization act have been properly expended by the company, in order that $408,000 held by the Old Colony Trust Company as trustee may be paid to the company.

Will Advance Equivalent of Coupons.—The committee representing the holders of the 4½ per cent general mortgage gold bonds of the New Orleans Railway & Light Company, New Orleans, La., has announced that it will advance through its depositaries the equivalent of all coupons to bondholders who have deposited or may deposit their securities with the committee. This announcement followed the declaration by Receiver O'Keefe recently to the effect that the company would not pay until April 1, 1922, the coupons of the 4½ per cent bonds due on Jan. 18, 1922. The receiver thus takes advantage of the period of grace which is given in the mortgage securing this issue of bonds.

$1,930,000 of Bonds Offered.—Halsey, Stuart & Company, Inc., and Paine, Webber & Company, New York, N. Y., are offering an issue of $1,930,000 Wisconsin-Minnesota Light & Power Company, LaCrosse, Wis., general and refunding mortgage 7 per cent gold bonds, series "A," at 99 and interest, to yield about 7.10 per cent. The bonds are non-callable for ten years and mature Jan. 1, 1947. The company owns and operates, without competition, a system of electric light and power properties, serving forty-nine communities located in western Wisconsin and eastern Minnesota. The property also includes 11½ miles of city railway lines in Eau Claire and 12½ miles of interurban railway connecting that city with Chippewa Falls.

Payment to City Establishes Record.—An increase of more than $500,000 in the gross receipts on the city lines of the Connecticut Company, Hartford, Conn., was indicated in a report received recently by City Clerk John A. Gleason. The figures show fares of $2,682,007 for the calendar year of 1921. For the calendar year 1920 the receipts were $2,144,194 resulting in the payment of $42,884 to the city and in 1919 the gross receipts were $1,714,177 for which the company paid the city $34,284. Under the provisions of the Tucker grant, the Connecticut Company is obliged to pay the municipal government an amount equal to 2 per cent of the gross revenue obtained from fares collected within the city limits. And on this basis with fares of $2,682,007 the city will receive $55,641 in comparison with $42,884 for the 1920 collections. In 1901 the fares paid within the city limits of Hartford totalled $527,498. The totals of gross fares collected within the city limits from 1915 to 1921, inclusive, follow: In 1915, $1,220,415; in 1916, $1,380,192; in 1917, $1,464,604; in 1918, $1,485,067; in 1919, $1,714,176; in 1920, $2,144,194; in 1921, $2,682,067.

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Traffic and Transportation

State Versus City

City of New Orleans, Anxious to Put an End to Receivership, Is Opposed by State

I. V. Kittridge, city attorney of New Orleans, La., filed a brief in the State Supreme Court on Jan. 3, in answer to the application of State Attorney General Coco for an injunction to enjoin the Commission Council from passing an ordinance or doing anything to interfere with the 5-cent fare under the franchise of the New Orleans Railway & Light Company.

This case comes up on appeal from the Civil District Court for the parish of Orleans wherein Judge Parker refused the injunction asked by Attorney General Coco on the ground that the original application was premature.

The brief of the city attorney refers to the facts in the case already developed that the United States District Court last April enjoined the Mayor and the Commission Council from interfering with the collection of an 8-cent fare by Receiver O'Keefe, and that repeated meetings have been held with the view of terminating the receivership and granting some relief to the people of New Orleans from the present fare, electric light and other service charges.

Believes Conference Showed Early Termination of Receivership

The conference showed, so City Attorney Kittredge declares, every indication of an early, advantageous and desirable termination of the receivership, all of which negotiations, it is stated further, have been stopped by the action of the State Supreme Court, in consequence of which desired relief has been denied the public.

In opposition to the contention of the State Attorney General, that the State had a right to enjoin the city from passing any ordinance or resolution; that the city was without rate making power; and lastly that the 5-cent fare provided in the franchise of the railway formed an inviolable contract, City Attorney O'Keefe cites from decisions of the Supreme Court of the State to show that the city has full police power to make rates.

A section of the city charter clothing the city of New Orleans with this authority, made part of the brief of City Attorney O'Keefe, is as follows:

> The city shall have all powers, privileges and functions which by or pursuant to the constitution of this state have been, or could be, granted to or exercised by any city.

City Attorney O'Keefe concludes a summary of the record in the brief as follows:

> We submit that the Attorney General cannot at this time enjoin the Commission Council of New Orleans from acting; that the Commission Council of the city of New Orleans is vested with full rate-making powers and that these powers have been preserved to it by the new constitution; and finally that the city, in the interest of the welfare of its people, has the right, by agreement with the railway company, to fix a rate of fare that will make it possible for the utility to furnish the necessary transportation and lighting service in New Orleans.
>
> The state could not possibly profit from the decision which it asks. It seeks to deprive the city of home rule, to place an unnecessary burden on the citizens of the municipality, at the same time securing no possible benefit or profit for the citizens of the balance of the State. What reason and what demand is there in law or in equity for this judgment to refer utilities operating exclusively in the city of New Orleans to the jurisdiction of the Public Service Commission, rather than to the Commission Council elected by the people of this city?

Federal District Court Grants Appeal to U. S. Supreme Court

Another angle to the fight being made by Attorney General Coco against the 8-cent fare developed on Feb. 3 when Judge Rufus Foster, of the Federal District Court, granted the State's Attorney General an appeal to the United States Supreme Court, from the decree of Circuit Judge N. P. Bryan and District Judges Rufus Foster and H. D. Clayton, of Birmingham, Ala., restraining the Attorney General and his assistants from interfering with the New Orleans & Railway Company.

The appeal was based upon the contention of Paul A. Sompayrac, representing the State of Louisiana, that the injunction restraining the Attorney General and his assistants from bringing suit against the railway actually restrained the State, because the Attorney General is the only officer who has authority to appear for the State.

Five-Cent Fare Experiment Starts on Eastern Massachusetts Line

The Eastern Massachusetts Street Railway, Boston, Mass., has decided to experiment with a 5-cent fare. At the request of the Mayor of Chelsea the public trustees have voted to operate a 5-cent route between Chelsea square in Chelsea and Scollay Square in Boston, beginning Feb. 10. Ten-strip tickets have to be bought. The experiment is recommended by Superintendent Hardy of the Chelsea division.

In connection with this fare reduction on the line between Chelsea and Boston the trustees will experiment also with the Cleveland type of fare boxes which retain the tickets and cash fares until the boxes are opened at headquarters. The conductors will not handle any cash.

Company Conforms to Law.—According to a recent decision of Special Judge A. B. Anderson in the Criminal Court at Nashville, Tenn.. the Nashville Railway & Light Company is meeting the requirements of the "Jim Crow" law in designating with regular signs the sections for the white and black respectively.

Report Commends International Railway

Operation and management of the Buffalo city lines of the International Railway Company, Buffalo, N. Y., are commended in a special report of the engineering department of the Public Service Commission. Although an exhaustive survey of traffic conditions was made by inspectors of the commission only two recommendations are embodied in the report. These are that seventy-two additional cars could be operated to make service adequate in the morning and evening rush hours and that several lines should be rerouted to avoid congestion in the heart of the downtown business district.

The report says that if the increased service which is suggested is supplied, the company still would have adequate reserve equipment. The overhaul of cars on a two years' basis and a general inspection of cars on a seven days' basis are called reasonable.

It is pointed out that an expenditure of $2,907,869 in the last four years has resulted in material improvement of the company's rolling stock, and it is declared the physical condition of the property never has been so good. The number of "pull-ins" is not considered excessive.

Other items in the report say:

> Only two flat wheels were reported for December, 1921, and these were chilled cast iron pony wheels. The record is due to the substitution of steel wheels for chilled cast iron wheels.
>
> The method of car cleaning appears to be proper, and an average of ten cars per car cleaner is deemed a reasonable assignment.
>
> The rules of the company in the matter of heating and ventilation are considered proper.
>
> The location and number of emergency and wrecking trucks are proper and sufficient.
>
> One of the principal requirements of the transportation department is that every employee should be on duty during the period of maximum service demand. This was not complied with at the beginning of the investigation.
>
> Owl service now furnished between the hours of 1 a.m. and 5 a.m. on thirteen lines under order of the commission appears to be adequate. The number of passengers carried now is less than the number carried at the time the order of this commission was made.

The report sets forth that there was a falling off of approximately 28,500,000 in the number of passengers carried in Buffalo last year as compared with 1919. Taking into account the loss of revenue, incident to this decrease, the report points out that the compliance with the suggestions made will result in as efficient service as can be furnished and that such service would reasonably meet the requirements for safety, comfort and convenience of the majority of car riders.

The survey showed that there are 719 cars assigned to the Buffalo city division.

Petitions Fare Continuation

The Springfield (Mo.) Traction Company has applied to the Missouri Public Service Commission for continuation of the present fare rate, 7 cents cash or four tokens for 25 cents and 3 cents for children. This rate went into effect in June, 1920, and was continued in 1921.

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Supplements Original Rate Order

California Body Continues Calendar Month Ticket, Reduces Some Commutation Rates, Raises Others

Supplementing its original order, granting an increase of rates on lines of the Pacific Electric Railway, Los Angeles, Cal., the California State Railroad Commission has ordered that the present calendar-month dated tickets based on one round trip daily for each day in the month be continued; that individual commutation tickets dated monthly and good for one round trip daily except Sunday shall be established at rates 10 per cent less than the rates now in effect for the full calendar-month ticket, and that undated sixty-ride, forty-day individual commutation tickets shall be established at the rates approximately 20 per cent higher than those obtaining under the old schedule.

The order was issued following the rehearing of the commission's order of Dec. 24. The rehearing was held in Los Angeles before the commission *en banc* on Jan. 24, 25 and 26. The commission is now awaiting the results of the rehearing of the Hollywood protests against the local fare rise and service, which is set for Feb. 24.

The adoption of undated sixty-ride, forty-day individual commutation tickets will re-establish a form of transportation in effect prior to Jan. 1, 1922, at rates approximately 20 per cent higher than those obtaining under the old schedule. By reason of the adoption of a non-discriminatory mileage basis it is impossible to accomplish an exact 20 per cent increase over the old rates for this form of ticket, but the rates will be as near such amount as the maintenance of the mileage schedule will permit. This form of ticket will show an increase on the mileage basis of approximately 15 per cent over the present calendar-month ticket. The sixty-ride ticket shall be on sale at any time, good for forty days from date of sale, and any number of rides may be used on any one day by the purchaser, the only restriction being that the ticket shall be used by the original purchaser within the forty-day period. It is believed that this form of ticket will provide for the transportation needs of persons who have occasion to ride only five days a week, and for that reason no additional five-day commutation ticket has been established. All of the newly established rates are based on the mileage scales set forth in the order. These new rates were effective Feb. 1, 1922.

The new rates on mileage basis for the re-established sixty-ride, forty-day individual ticket are as follows:

From 1 to 10 miles	1.38 per mile
From 11 to 15 miles	1.242 per mile
From 16 to 20 miles	1.104 per mile
Over 20 miles	1.035 per mile

All fares shall be constructed on actual mileage, except in communities where it is necessary to zone certain terminal points.

In all other respects the original Order No. 9928 remains in effect.

Glendale, South Pasadena and Alhambra city attorneys further entered protests that the through one-way ticket prescribed in the first revised schedule of rates on interurban trains of the Pacific Electric was in excess of the combination of the local fares.

The efforts of these close-in interurban communities were to break down the commission's method of rate adjustment for the Hollywood district. But it was advanced to them by the commission that Hollywood was getting a distinct service known as local trolley service, and these interurban communities were given fast interurban service, which was entirely a separate and distinct service and had no comparison with a local service, even if some of the local service was rendered over the interurban lines serving these suburban towns.

Schedule Changes Planned

Revised service schedules are now being prepared for all lines of the Southern Cambria Railway, Johnstown, Pa. For the present forty-minute schedule to and from South Fork a twenty-four minute service will probably be substituted, and for the eighty-minute service to Ebensburg a seventy-two minute schedule.

Although the franchise which the company has with the borough of Conemaugh calls for a twenty-minute service, the company is confident that by discarding the local cars between Franklin Street and Conemaugh on a twenty-minute schedule in favor of the uniform twenty-four minute service better service can be maintained. The company claims that the majority of residents in Conemaugh favor the more certain twenty-four minute schedule.

New Election on Fares Called

The State Supreme Court of Louisiana has reversed the decision of the lower court and has directed that the city officials of Shreveport shall issue the call for the election on the fare issue there in accordance with law.

The citizens of Shreveport, at an election held on May 18, 1921, ratified an ordinance proposed by the Commission Council of that city granting an increase in fares from 5 to 6 cents by the Shreveport Traction Company. Suit to annul the election was instituted by Huey C. Long, now a member of the Public Service Commission, against the officials of the city, to invalidate the election on the grounds that the call was illegal.

Judge J. L. Land of that city dismissed the suit on the grounds of no cause of action. From this ruling Mr. Long took an appeal to the State Supreme Court. In his bill of exceptions, he assailed the legality of the election granting the increase of fares, claiming the ballots furnished the electors were illegal, and that no provision had been made in the ordinance for the transportation of school children.

Rate Cut Upheld by Court

The Federal Court of Appeals sitting at New Orleans has just decided the case of the Georgia Railway & Power Company, Atlanta, against the Georgia State Railroad Commission. While the decision concerned gas rates specifically, it is none the less important to electric railways as most of the points of law involved concern all public utilities.

The Georgia commission some weeks ago ordered a reduction in gas rates in Atlanta, whereupon the Georgia Railway & Power Company obtained a temporary injunction in the Federal courts restraining the commission from enforcing the lower rates. At the same time the company asked for a higher rate to take care of an alleged loss of $1,000,000 sustained from 1917 to 1920 inclusive. Subsequently the injunction was extended to Jan. 30, 1922, while the Federal Court of Appeals at New Orleans was reviewing the case.

The decision as handed down by the Court of Appeals upholds the Georgia Railroad Commission and denies all of the contentions made by the utility corporation. The decision of the three judges was unanimous.

One of the important points of law involved was the including of federal income taxes in operating expenses. The court denied the Atlanta company this right, and censured it for so including this charge. The power company also was declared to have placed too high a valuation on its properties. It denied the right of the company for a higher rate to take care of its alleged million dollar loss, and also denied it the right of including its franchise value in its property valuation.

According to Preston S. Arkwright, president of the power company, the case will probably be carried to the United States Supreme Court.

In the meantime, due to its order being upheld, the Georgia commission has ordered all gas companies in the State to appear before it March 13 to April 1 and show cause why present rates should not be reduced. It is also said that upon completion of these hearings the commission will take similar action in regard to other public utility rates. The commission is said to hold to the opinion that the period of reconstruction is virtually past and that the burden of proof is upon the utilities of convincing the commission that the emergency rates of war time should be permitted to continue.

Passenger Decrease Serious.—With a passenger decrease of 29,744 in December, 1921, as compared with the same month in 1920, although still 6,000 more than the November total, the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, is considering ways and means by which it may keep up revenues. The city railway commission gave out this information recently, and said that the stabilizing fund of $20,000 set up in March, 1921, is now at less than the $15,000 mark.

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Washington Rates Expire Soon

Companies in National Capital Favor Continuation of Present Fare—Merger of Lines Opposed

The Public Utilities Commission of the District of Columbia has taken under advisement arguments heard the past week by the Capital Traction Company, and the Washington Railway & Electric Company as to the fare that shall be charged after the present rate expires on March 1. A zone system, providing for two fares in the suburbs of the city, or continuation of the present fare, which is 8 cents cash or 5 tokens for 35 cents, was advocated by the Washington Railway & Electric Company. The Capital Traction Company advocated continuation of the present fare.

It was stated by President W. F. Ham of the Washington Railway & Electric Company, that for 1921 the company earned 6.17 per cent based on the valuation of the company as fixed by the commission, but 3.42 per cent based upon the company's valuation. Several of the suburban lines of the company, he said, failed to earn operating expenses last year. The company had reduced expenses during the year by $80,000 through the use of cars operated by one man. Of this amount $40,000 was used in remodeling cars to the one-man type. A falling off in travel was anticipated for 1922 due to probable discharge of government employees to reduce government expenses. During and after the snow storm of Jan. 28 the company lost $69,000 because it could not operate cars.

The company contemplates extension of its Eleventh Street and Lincoln Park lines, no extensions having been made since 1918. It is proposed to extend the Eleventh Street line from its present terminus at Eleventh and Monroe Streets, N. W., to Spring Road, thence out Kansas Avenue to connect with the Georgia Avenue line, over head trolley type, at a cost of $107,940. The East Capitol Street Extension in the Lincoln Park section would cost $97,250.

Mr. Ham said he was not opposed to a merger of the two railways, but it was a matter for Congress to decide. He advocated that the investment return allowed to public utilities in the District should be fixed at 8 instead of 6 per cent.

Vice-President and General Manager J. H. Hanna of the Capital Traction Company also advocated an 8 per cent return for the company. The present fare yielded his company 10.26 per cent on the valuation fixed by the commission as against 8 per cent under the company's valuation. Two suburban lines of this company were being operated at a loss. He did not anticipate decreased traffic in 1922. The recent snowstorm cost the company $20,000 in passenger revenue and $10,000 in damages and expenses. This company did not contemplate installing one-man cars as they were difficult to operate in the congested districts.

The Citizens Association Federation advocated a 7-cent cash fare and four tokens for 25 cents. It also suggested that the two companies use the same tracks in some locations.

Astoria Fares Raised from Five to Seven Cents

Effective on Feb. 6, single cash fares on traction lines of the Pacific Power & Light Company, Astoria, Ore., were increased from 5 to 7 cents. This change followed action by the Oregon Public Service Commission in withdrawing its order of suspension issued at the time the tariff originally was filed by the corporation. Under the new tariff tickets in books of fifty may be purchased at the rate of 6 cents each, while so-called school ticket books, good for forty rides, may be purchased for $1.75.

The new tariff was filed about seven months ago, but was suspended by the Public Service Commission pending an investigation. The commission still retains jurisdiction on the case and may order modifications of the tariff if found advisable. In withdrawing its order of suspension the commission said it was evident that continuation of the 5-cent fare would fall far short of meeting actual operating expenses and would inevitably result in discontinuance of trolley service.

Governor Urges 5-Cent Fare Bill in New Jersey

Governor Edwards in a special message submitted to the New Jersey Legislature Feb. 7, called for the passage of a bill introduced by Senator Alexanter Simpson of Hudson County, Democratic minority leader, providing for a return to the 5-cent trolley fare in those cities which prior to the war had 5-cent franchise contracts with traction companies, later upset by the courts. The Governor said:

> We are rapidly returning to conditions approximating those before the war, and it will be only a short time before the 5-cent fare will be extremely profitable again. I therefore urge upon the Legislature the duty to add to the Public Utility Statute the legislative declaration that this statute shall not be construed to authorize the fixing of any fare in excess of 5 cents for trolley transportation.

The Governor said that when there had been a public demand for 3-cent fares, the traction companies pointed to the franchises as compelling them to furnish transportation at 5 cents even though the rate should be unprofitable. They claimed the advantages of profitable fare, the Governor said, on the ground that they would have to stand the loss of possible unprofitable years, but when the unprofitable years came along these contracts were repudiated by the companies.

Referring to the Simpson bill the Governor said in his message that the bill if passed would help to relieve the State from the condition of virtual paralysis of the Public Utility Commission in the matter of fixing trolley rates.

Albany Case Nearing Close

All evidence has been taken in the hearing of the petition of the United Traction Company, Albany, N. Y., for an 8-cent fare on its lines. Cross-examination of witness has been ended also. The attorneys have two weeks in which to file briefs with the Public Service Commission.

At the last hearing, on Feb. 6, Corporation Counsel Guy, of Troy, suggested that the fare matter be taken out of the hands of the Public Service Commission. This suggestion received no support. He said that since the company was insolvent, not even a 10-cent fare would enable it to give adequate service. The attorney for the company stated that an 8-cent fare would put the company on a paying basis.

Sacramento Keeps Five-Cent Fare

The 5-cent fare will continue in Sacramento, Cal., on the lines of the Pacific Gas & Electric Company. The company had filed a tariff providing for that rate, and the California State Railroad Commission granted the continuation.

One-man cars also will go into operation in Sacramento, the commission having ruled last December that a 5-cent fare could continue only if this type of car was installed and operated.

Had former conditions remained, according to the commission, a 7-cent fare must be allowed the company. Accordingly, the city repealed an ordinance passed last fall prohibiting the use of one-man cars.

Transportation News Notes

Reading Experiments with Seven-Cent Fare.—A 7-cent cash fare has replaced the 8-cent city fare and 9-cent rural fare on the lines of the Reading Transit & Light Company, Reading, Pa. No reduction will be made in strip tickets. The 7-cent fare will be tried for six months, after which the Public Service Commission will decide upon a permanent rate. In the meantime the company will report monthly its receipts and the number of passengers carried.

Commission Approves Brunswick Change.—The Georgia State Railroad Commission has approved the deal whereby the Brunswick & Interurban Railway takes over the property and lines of the Suburban Street Railway. The line was almost scrapped due to the court action against the company, and was taken over to prevent this by a group of young business men of the city who formed the present company. About $35,000 in new capital has been paid in and the new company is continuing operation of the lines. The action of the young men's club has been referred to in previous issues of the ELECTRIC RAILWAY JOURNAL.

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Personal Mention

G. W. Wattles Leaves Omaha

Prominent Traction Leader Retires From Omaha & Council Bluffs Company—Goes to California

Gurdon W. Wattles, who retired in January after a long and active service with the Omaha & Council Bluffs Street Railway, Omaha, Neb., may be referred to as "One of the master builders of Omaha and the West." In fact this deserved tribute was accorded to him at a recent farewell banquet given by 150 of Omaha's leading business men.

He distinguished himself as a traction executive over a period of nearly twenty-five years, during which time Omaha passed from the status of a thriving Western community to its present metropolitan importance. His business acumen carried him into other fields of endeavor, but he will be remembered first for his development of the properties of the street railway system.

At the annual meeting of the board of directors Mr. Wattles resigned as chairman of the board. He has established his future home near Los Angeles, Cal.

Thirty Years a Force in Omaha

Mr. Wattles came to Omaha thirty years ago from Carroll, Iowa, and entered the Union National Bank. He was vice-president and later president. During 1898 he became interested in the organization then known as the Omaha Street Railway, and was elected to the board of directors in 1900. He soon became vice-president of the company and was active in the consolidation of the Omaha Street Railway and the Omaha & Council Bluffs Railway & Bridge Company, the consolidated properties being incorporated as the Omaha & Council Bluffs Street Railway. This present company operates all the electric railway lines in Omaha and its neighboring city, Council Bluffs, Ia., across the Missouri River.

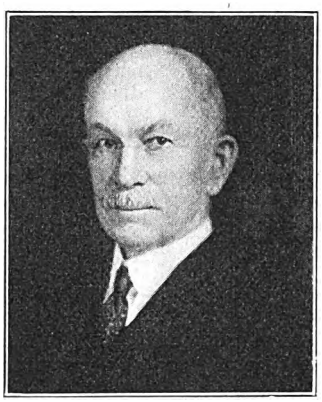
Mr. Wattles became president of the Omaha & Council Bluffs Street Railway in 1905, serving in that capacity continuously for fifteen years. His resignation from active management was followed by his election as chairman of the board of directors.

At the time of the consolidation, nearly twenty years ago, Mr. Wattles faced the problem of building up the dilapidated lines and equipment in Omaha and Council Bluffs. Business depression of years was reflected in the condition of the system. Under his administration, after the consolidation, a street railway system probably second to none in the country was built up. New rails of a heavier type were laid and out-of-date cars were replaced by cars of a modern and uniform type. More than $10,000,000 was spent on the property after the consolidation and under the administration of Mr. Wattles.

In his extensive program was the establishment of shops for repairing and building cars. The company has built practically all of its equipment during the last ten years. A large and modern power house was built on the riverfront and six commodious carhouses were constructed. The tracks on all lines have been rebuilt and placed on concrete or crushed stone base and heavy rails have been used for reconstruction.

"To deserve the good opinion of the patrons of the company by rendering a service above criticism," has been Mr. Wattles' motto.

"I think it truthfully can be said that the Omaha & Council Bluffs Street Railway is as near a popular public service corporation as can be found anywhere in this country," Mr. Wattles stated before leaving for California. "The equipment and service are of a high class, that bring commendation from all who compare them intelligently with other cities."



Gurdon W. Wattles

The particular ability of Mr. Wattles has been shown in his first class organization of the forces under him. He chose as subordinates the very best men that could be found to work out the technical operations of the railway property, and this has been the secret of his success in private and public work.

Mr. Wattles was the chief figure in the promotion of the Transmississippi Exposition, which was held in Omaha in 1898. This great enterprise was launched during a period when real courage and faith were required to carry it to completion. Mr. Wattles personally obtained the official co-operation of the government of this country, of Canada and of the Pan-American countries. He succeeded in those efforts, just as he succeeded in everything else he undertook. He also led the business interests of Omaha to a successful conclusion in the establishment of the Omaha Grain Exchange and Omaha today is an important terminal grain market. He was the central figure in Omaha's realization of its first great hotel—the Fontenelle—an imposing structure of which any metropolis might be proud. In fact his influence has been felt in every important movement in Omaha and in that part of the West.

Mr. Hungerford Shows Up Trolley Troubles

"Your Trolley Cars" is the title of an article in the Jan. 21 issue of *Collier's* which brings to the general reader a spirited presentation of the problems confronting traction companies. Edward Hungerford, the author, who specializes in handling transportation subjects and has contributed to the ELECTRIC RAILWAY JOURNAL, writes history entertainingly and reviews in the article the work of Edwin M. Walker, general manager of the Terre Haute, Indianapolis & Eastern Traction Company, who, like Edward Bellamy, "looking backward," found that service was the missing element in the present as compared to the past. By providing what was needed, he increased the number of passengers in spite of increased automobile competition.

From his wide and intimate acquaintance with the industry Mr. Hungerford recalls what John L. Livers did for the Charlottesville & Albemarle Electric Railway to make it a going concern. Painting the cars orange and blue, with true university patriotism, was not the least of his changes. Mr. Hungerford describes the successful adoption of the weekly pass in Youngstown and other methods of selling transportation. This salesmanship Mr. Hungerford considers the solution to the difficulties of railway companies.

P. T. Robinson has been appointed division engineer of the East Bay Electric Division of the Southern Pacific Company. Mr. Robinson was formerly assistant division engineer of the Western Division. He was succeeded in that post by J. P. Edwards of Ogden, Utah.

Joseph F. Bradner, Sr., formerly connected with the engineering and power department of the New Orleans Railway & Light Company as constructor and architect, and more recently associated with the building division of the city engineer's office, has been appointed secretary of a local realty company.

W. O. Clure has resigned as general passenger agent for the Twin City Lines, Minneapolis, effective Feb. 15. He will become associated with the Chicago office of Barron G. Collier, Inc., New York, N. Y. Mr. Clure succeeded A. W. Warnock with the Twin City Lines on Feb. 5, 1920. Previously he had assisted in publicity work for the company for about a year.

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Charles D. Jones, president of the Cincinnati Gas & Electric Company and secretary and treasurer of the Miami Railway, Dayton, Ohio, has succeeded his father, Major Frank J. Jones, as one of the directors of the Cincinnati (Ohio) Street Railway. Major Jones desired to retire. Samuel Assur, who has been second vice-president of the company, was also elected a member of the board of directors.

Obituary

George W. Jackson, formerly engineer of Mayor Thompson's traction commission, Chicago, Ill., and senior member of the George W. Jackson & Fitzpatrick Company, contractors, died on Feb. 5. Mr. Jackson had frequently been retained in connection with traction matters. Recently he contended before the Illinois Commerce Commission that a return to the 5-cent fare on Chicago Surface Lines was possible by virtue of economies and rerouting, he suggested. He favored a subway system and submitted proposals for the construction of one. In the contracting field Mr. Jackson's most important accomplishment was the construction of Chicago's 60 miles of freight tunnels in the downtown section of the city.

George L. Radcliffe, general manager of the Cleveland (Ohio) Railway, died on Feb. 9. He has held this position since 1912. Mr. Radcliffe had an active railway career, beginning as conductor on the old Broadway and Newburg line in Cleveland when J. J. Stanley, now president of the company, was the superintendent. He was advanced from conductor to cashier and paymaster, and later became superintendent. He was for some time associated with the Detroit (Mich.) United Railway and also with the Schenectady (N. Y.) Railway. In 1910 he returned to the Cleveland Railway as superintendent of the consolidated lines of the city. In 1912 he was appointed general manager of the company.

Thomas A. Delaney, superintendent of transportation of the New York (N. Y.) Railways, died Jan. 3. Mr. Delaney was associated with the New York Railways for thirty-six years, and since 1912 has held the position of transportation superintendent. His earliest association in the electric railway field was formed in 1886 when he became timekeeper for the Broadway & Seventh Avenue Railroad, New York City. He also worked in the general office of this company, but after the Metropolitan Street Railway was organized he transferred and for some time had charge of operation of various lines which that company leased. In 1900 he was appointed supervisor of transportation of the company. In 1912 he was appointed superintendent of transportation of the reorganized New York Railways Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Firm of Spooner & Merrill Organized

Charles W. Spooner, consulting engineer, Grand Rapids, Mich., has announced the organization of the firm of Spooner & Merrill, consulting engineers, with offices in Grand Rapids. The firm has secured the services of Charles A. Hamilton, formerly with the Fargo Engineering Co., Jackson, Mich., as specialist in mechanical engineering, and of Donald M. Cook, who will continue in charge of valuations and appraisals. Both Mr. Spooner and his new partner are natives of Grand Rapids, both have degrees in civil engineering from the University of Michigan.

Mr. Spooner has had a broad experience in civil engineering and valuation work and as an expert in engineering litigation.

Mr. Merrill received his degree in 1902 and was then employed for some time in the office of the United States Engineer, and subsequently in the office of the City Engineer in Grand Rapids. He was actively associated with the harbor work in a number of Michigan cities. For thirteen years thereafter, he was engaged in the engineering of the New York State barge canal. Subsequently he became principal assistant to Joseph Ripley who is known for his service as chief engineer of the Grand Canal Improvement Board for the Chinese Government and in connection with the canal work at the Soo, Panama and in New York.

Westinghouse Electric Makes Changes in Personnel

Announcement of changes and transfers in personnel of the Westinghouse Electric & Manufacturing Company has been made by officials of that company. Several changes have recently been made in the railway sales department, the organization of which is:

F. H. Shepard, director of heavy traction; M. B. Lambert, manager; E. D. Lynch, office manager; F. F. Rohrer, assistant to manager in charge of contracts; C. H. Long, section manager railway equipment contracts and orders; R. Seybold, manager price section; T. H. Stoffel, electric railway freight haulage export; W. R. Stinemetz, manager, and R. W. Carter, assistant manager of the heavy traction division; K. A. Simmon, manager light traction division; J. L. Crouse, manager, and J. W. Lewis, assistant manager railway development and supply division.

H. A. Campe has been appointed manager of the small motor appliance section of the industrial department, succeeding V. M. Beeler, who has been transferred to the Springfield office.

G. L. Washington has been appointed assistant to manager of the Havana, Cuba, office of the Westinghouse Electric International Company.

South African Railway Electrification

Cable advices announce that the contract for electrification of 170 miles of single track of the South African Railway between Pietermaritzburg and Glencoe has been given to the Metropolitan Vickers Electric Company, of Manchester England. The cost of this work will be about £750,000, being based on a revision of the British bids as of Jan. 1. No new bids were asked for, since the old ones were reduced in amount on account of wage cuts.

Electrical Exports Amounted to $95,814,885

Electrical exports for December, according to the Electrical Division of the Department of Commerce of the United States, amounted to $5,177,276, making the total preliminary figure for 1921 $95,814,885. Exports for 1920 exceeded those of the year just passed by approximately $6,000,000 only. Comparing by classes of goods exported the two years 1920 and 1921 certain gains were shown. Transformers showed a gain of more that $3,000,000, from $4,803,158 for 1920 to $7,988,440 for the twelve months of 1921.

Peking Tramways Planning Improvements

Extensions involving 15 miles of track and the construction of a 1,500-kw. electric generating plant are being planned by the Minister of Communications at Peking, who is chairman of the board of directors of the Peking tramways. According to Commercial Attaché Arnold, bids for material, equipment, trucks will be opened on March 20. The cars will be built in China.

Metal, Coal and Material Prices

Metals—New York	Feb. 7, 1922
Copper, electrolytic, cents per lb.	13.125
Copper wire base, cents per lb.	14.125
Lead, cents per lb.	4.70
Zinc, cents per lb.	4.80
Tin Straits, cents per lb.	31.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.72
Somerset mine run, Boston, net tons	1.87
Pittsburgh, mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	2.00
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, New York, cents per lb.	6.25
Weatherproof wire base, N. Y., cents per lb.	16.50
Cement, Chicago consumers net prices, without bags	1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	79.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	92.00

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Rolling Stock

The Macon Railway & Light Company, Macon, Ga., has placed thirteen standard safety cars in service. These were made by the J. G. Brill Company.

The Santa Barbara & Suburban Railway, Santa Barbara, Cal., has placed in service eleven standard safety cars, purchased from the American Car Company.

The Central California Traction Company, San Francisco, Cal., reports that it has built the body for one 40-ft. electric locomotive in its shops. This locomotive is of semi-steel construction and will be used in interurban service.

The Georgia Railway & Power Company, Atlanta, Ga., has placed six prepayment passenger cars in city service. These cars are 44 ft. 6 in. long and have a seating capacity of forty-eight. They were built by the Cincinnati Car Company.

The Waterbury & Milldale Tramway Company, Waterbury, Conn., reports that it has placed two war-board cars, manufactured by the J. G. Brill Company, in service. These cars are of semi-steel construction and seat fifty-six passengers.

The Connecticut Company, New Haven, Conn., reports the purchase of three semi-steel cars either for one-man or two-man operation. These cars are 43 ft. over all and have a seating capacity of fifty-two. They were built by the Wasson Manufacturing Company.

The Municipal Railways of San Francisco, through the City Engineer, M. M. O'Shaughnessy, is authorized by the supervisors to prepare specifications for twenty center-entrance street cars. Specifications are nearing completion and bids will be asked in immediate future.

Track and Roadway

Kitchener, Ont.—The ratepayers have passed the by-law authorizing the raising of $63,000 for electric railway extensions.

Jacksonville (Fla.) Traction Company is completing an extension on the Brentwood line, which loops around and into the Florida State Fair grounds.

Winnipeg (Man.) Electric Railway will be requested by the Municipal Council of St. Vital to construct an electric line on St. Anne's Road to Lavalee School.

North Shore Connecting Railroad, Evanston, Ill. has made application to the Illinois Commerce Commission for permission to construct an electric railway through certain parts of Evanston and Wilmette.

Cincinnati (Ohio) Traction Company has been directed by Street Railway Commissioner Kuertz to begin repairs on the Fairview Heights inclined plane so it can be used safely for single-track cars. Engineers who made the report advise automatic bumpers at both landings and reinforcing the "track stringers" with heavy timbers.

Interstate Public Service Company, Indianapolis, Ind., is constructing a high-tension transmission system from Reddington, 6 miles north of Seymour, and about half way between Jeffersonville and Indianapolis, to North Vernon It will connect with the high-tension line from Jeffersonville and Louisville to Indianapolis. Another line is being erected from Mineral Springs to Elizabethtown, which will supply energy for farm and homes. The North Vernon Company will purchase power from the Interstate company.

Power Houses, Shops and Buildings

New York, (N. Y.) Transit Commission will finish construction of the Jerome Avenue Yard with the $72,000 appropriated by the Board of Estimate. The board refused to allow the commission any funds for purchasing anti-creepers, or to paint the columns of the White Plains section of the Interborough Rapid Transit lines.

Terre Haute, Indianapolis & Eastern Traction Company Indianapolis, Ind., will consider an enlargement of the West Tenth Street power plant, which furnishes power to the Indianapolis Street Railway, or the building of a new power plant in the Vigo County or adjacent coal field, it became known recently. The enlargement would cost approximately $3,000,000, it is said.

Waukesha, Wis.—A new power line connecting the West Allis substation of the Milwaukee Electric Railway & Light Company with the new substation of the Waukesha Gas & Electric Company on Barstow Street will be ready for use some time in March. The Milwaukee company built the new circuit from West Allis to the east city limits of Waukesha and the Waukesha company constructed a tower line from there to Barstow Street station.

Professional Notes

The Associated Engineers, Inc., Milwaukee, Wis., is a firm recently incorporated by F. W. Ullius, Jr., William E. Skinner and Ralph M. Kibbe to engage in consulting engineering. Mr. Ullius is president of the firm and Mr. Skinner, who was formerly with the electrical department of the Chicago, North Shore & Milwaukee Railroad, is vice-president.

The Chillingworth Engineering Corporation, New York, N. Y., announces that it has associated with it Frank H. Plum, Herbert Pluemer, George E. Mellin, and Harold von Thaden, all formerly of the C. W. Hunt Engineering Corporation, and will carry on a business similar to that conducted by the C. W. Hunt Engineering Corporation. It will occupy offices at 143 Liberty Street.

Trade Notes

Westinghouse Electric & Manufacturing Company East Pittsburgh, Pa., announces that T. H. Hays has been appointed manager of the Indianapolis office of the company.

Automatic Reclosing Circuit Breaker Company, Sixth and Wesley Avenues, Columbus, Ohio, has recently placed on the market a new automatic starter for direct-current motors of 10 hp. capacity or less.

Hancock Manufacturing Company, manufacturer of portable oil burners, torches, furnaces, etc., has moved its Philadelphia office to 1726 Sansom Street, Bell telephone, Spruce 5626. Herbert Vogelsang, who has been connected with the company for six years, will be in charge.

The Ajax Metal Company, Philadelphia, Pa., has appointed H. L. Carpenter, Jr., formerly in charge of the Pittsburgh office and later connected with its main office in Philadelphia, as traveling representative in western Pennsylvania. Mr. Carpenter has been with the Ajax Metal Company for more than twenty years.

Bridgeport Brass Company, Bridgeport, Conn., has announced the appointment of W. D. Blatz as general sales manager. This appointment was noted in the ELECTRIC RAILWAY JOURNAL of Jan. 28. During his six years connection with the company, he has made a thorough study of the brass industry in its various branches. Before joining the Bridgeport Brass Company he had had twelve years' experience in the banking and brokerage business.

New Advertising Literature

Holophane Glass Company, 342 Madison Avenue, New York, has issued bulletin No. 343, describing the Holophane lightmeter, which is an accurate portable instrument designed for the measurement of footcandles, lamberts, etc.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just issued Circular 1094-B, describing turbine generator units. This publication contains a discussion of the reactance and impulse types of turbines, both the semi-double flow type and the multiple-cylinder type. Bleeder turbines and geared turbines are described. The generator is also discussed in detail, and illustrations are given to show the latest types of construction.

Accessories for Complete Conduit System.—The Sprague Electric Works of the General Electric Company, New York, N. Y., has issued two booklets describing Sprague materials for a complete conduit system. One of these is devoted to GreenfielDuct and the other to what is commercially known at Sprageletts, which include various types of conduit boxes and covers, together with fittings for complete wiring.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MACMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, February 18, 1922 — *Number* 7

In the Electric Railway Industry, but Not of It

WITHIN the next few days the committee on company and associate membership of the American Association, under the chairmanship of Frank R. Coates, will launch an aggressive campaign to bring the outsiders into the fold. The committee will appeal to the self-interest of those whom it seeks to enlist and can make a strong case along this line. But the strongest argument that can be put up is that the industry needs every available member in its association if it is to accomplish the work that ought to be done.

After all, the best work of this association, as of any other worth-while organization, is not done for its own members, but for the cause which it represents, as a whole. And each railway and each manufacturer in the railway field is getting a great deal of benefit from the association's activities even if only in the "prospect" class. Once the management of a company is convinced of this fact an application for membership will follow as a matter of course.

The way in which membership in the American Association is appreciated by those who have enjoyed its privileges was illustrated by the philosophical way in which assent was given to the considerable increase in dues a couple of years ago. Those who were inside wanted to stay there and were willing to pay for the opportunity to do so. It would seem that every corporation or individual eligible for membership would want to get in, even if for no other reason than that it is the proper thing to do.

Overheating Increases Maintenance Costs of Railway Motors

AT THE midwinter convention of the American Institute of Electrical Engineers, just closing in New York City as this issue of the ELECTRIC RAILWAY JOURNAL goes to press, a paper on railway motor heating was read by G. E. Luke of the Westinghouse Electric & Manufacturing Company. The paper is abstracted elsewhere in this issue, but from a rather different standpoint from that which the author had in preparing it. The paper was prepared to explain and illustrate an original method for predicting the service performance of a motor on the basis of a continuous load test. It is abstracted here to emphasize the importance of considering the characteristics of the insulation if maintenance costs are to be kept down.

This is the time of year when motors come into the shop in large numbers for repair. The extra duty thrown upon them due to snow and ice raises temperatures to the breakdown point, and out they go. Some of this annual epidemic of armature and field failures is unavoidable and must be taken as incident to the business, but much could be avoided by the exercise of greater care in preventing overloading of the motors.

The modern electric railway motor is so reliable that it is difficult to realize how sensitive is the insulation to very high temperature. And, as Mr. Luke points out, it is not the average temperature which is the criterion of safety or danger, but the "hot spots." This is particularly true of the ventilated motors, which have high continuous capacity but comparatively low thermal capacity. Unlike the old-time heavy motors, they must get rid of the heat that is generated about as fast as it is produced. The situation was clearly explained by J. M. Hipple in the issue of this paper for Jan. 21, 1922, page 107. The "old timers" could absorb a lot of heat in their copper and iron and could distribute this heat readily from one part to another within their insides, so capacious from the thermal standpoint. The newer motors are superior in every practical point, but they must be treated with proper consideration. This consideration will follow as a natural result from a careful study of the ways in which temperatures rise in the different parts of a motor and of the effects of high temperatures upon its vulnerable parts.

Getting More Work Out of the Tools in the Shop

THE principal means for keeping down electric railway maintenance costs is through intelligent use of labor-saving machinery. This axiomatic statement receives ready mental assent, but as to applying the principle, "there's the rub." There has been a tremendous development in machine tools of all kinds during the past five years. This fact is appreciated mainly in the manufacturing industries, where the advances took place most rapidly under the stress of wartime production. The utilities are now heir to all of this development, if they will but take advantage of their opportunity.

Electric railway shop, track, line and power departments already show some quickening influences due to the improvement in mechanical devices. Machinery is to a limited extent making the work of all departments more interesting as well as more efficient. In time the effect will be seen in reduced cost, but of course the rate of increase in the cost of labor for a time outstripped the improvement due to the tardy adoption of more and better machines.

The present time is one of transition from the era of hand craftsmanship to that of the machine, and level heads are needed to insure the adaptation of modern methods to familiar processes. Machines already at work, and not yet slated for retirement, must be made to work harder, and new tools must be secured to displace obsolete ones or to perform operations not performed by machines before.

Take the case of the maintenance shop, for example, and the machine shop in particular, for here it is that machines rule almost supreme. In spite of the great interest of superintendents of equipment and of master mechanics in machine operations the average electric railway machine shop does not contain many examples of up-to-date machine tools, and some tools now installed are not working as they might. The machine

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lathe, good, useful tool that it is, is still doing many things that ought to be done on special tools. Turret lathes, milling machines, boring mills, radial drills, etc., are not much in evidence in most cases. And the layout of the existing equipment would sometimes bear revision. It was refreshing to note, in a shop recently visited, that a fine turret lathe was being uncrated. From the looks of the machine it was evident that it will "eat up the work" when it gets a chance. In the same shop crates were being taken off a couple of up-to-date drill presses also. In another shop a new radial drill had just been set up, for the present to be used as a boring mill on motor-shell reboring. This job will require several months, after which another one just as good will be ready for the machine. But these cases are exceptional; the era of machine shop rehabilitation is but dawning.

Care Should Be Exercised in the Selection of Welding Electrodes

THE general adoption of arc welders for repair work both in the shop and on the track undoubtedly has permitted many savings in maintenance costs. But the adoption of correct welding practices has not always followed the introduction of the welders. Too often there has been a failure upon the part of those in authority to see that once a welding apparatus is purchased, it is properly used. The proper use resolves itself into careful selection and training of operators together with the selection of varying grades of welding steel or electrodes, suitable to each particular job.

It does not follow that a welding rod which works well in repairing an armature shaft will be suitable for the welding of a rail joint. Meanwhile many kinds of welding rods are being offered and are said to be suitable for welding almost anything. It should go without saying that any old kind of fence wire, cut up into rods, should not be purchased for welding purposes. On the other hand it will pay to be very careful in the selection of this welding material, which properly should be purchased on an analysis basis where each kind of rod may then be secured for the distinct kind of welding to be performed.

One set of experiments now under way has demonstrated very clearly that there is a very definite relation, for example, between the amount of carbon in the rail steel, that in the splice bars and that in the welding rod itself to the amount of carbon in the resultant seam metal. It has been shown that in the case of two joints with the same rail but with splice bars of different carbon content if the same welding rod is used in both cases the resultant seam weld will not be the same. The same thing is true when the same rail and the same splice bars are employed in both joints but with different welding rods. Hence as there cannot be two best methods for any particular case it follows that each case requires special consideration.

The recommendations of the manufacturers of welding equipment, with their facilities for determining the needs of each specific combination, should be closely followed, and if they are expected to give the best service, electric railway engineers using their processes should see that the manufacturers are kept informed of the results being obtained in the field. This applies also to special experiments that the railways may be making. The purpose of such co-operation is to permit the prompt correction of wrong practices.

The American Bureau of Welding has recently issued certain long-needed and valuable specifications for welding wire or electrodes which should be in the hands of all who are using either arc welders or acetylene welders for any purpose. These will permit checking of rod qualities, which is especially desirable with rods purchased in the open market as compared with those backed by the recommendations of the makers of welding equipment.

The electric welding art is dependent upon two main factors: good operators and proper materials. While a good operator may sometimes make a good weld with poor material, it is not fair either to the operator or to the art to expect the best results if the best of materials are not supplied. It will pay track and shop engineers to give the closest attention to both of these factors if the expected and beneficial results are fully to be obtained from the use of welding apparatus. Operators must be properly trained and materials must be selected with due regard to the kind of work to be done.

New York Transit Plans from an Engineering Point of View

THOSE who wish an outline of the general engineering principles of the New York transit plan will find it clearly expressed in the paper read by Mr. Turner at the meeting last Wednesday of the New York Section of the A. S. C. E. It is indeed a daring conception, although most of its individual features have been tried out and found successful by experience elsewhere. Briefly, it comprises service at cost for all bus, street railway and rapid transit lines within the city with a barometer fund, public ownership of the roads and private operation of them, three operating companies controlled by one central organization in whose board of trustees both city and private owners are represented, a flat fare and universal transfers, at least so far as each of the three operating companies are concerned, and finally, according to Governor Miller, at least, at first a 5-cent fare. This will be made possible, presumably, by the savings expected through city co-operation and traffic reforms.

Undoubtedly, many transportation men will express some disappointment that at a time of such radical changes no effort is being made to introduce some form of distance fare, even if it was confined to such a crude form as a charge for transfers on the surface lines. But it is true that political tradition and popular sentiment in New York are strongly opposed to anything but a flat fare and to a greater extent probably than in most other American cities. Should the present plan not work well, a distance fare can be introduced later perhaps as easily as now. In this connection Mr. Sprague brought out clearly that a flat fare with universal transfer system means greater congestion of the car lines than would otherwise be the case because passengers will ride for short distances which otherwise they would cover by walking.

Altogether New York seems destined to be the place where a most interesting test will be made in the near future of united action in improving transit conditions by a carefully thought-out co-ordinated system, co-ordinating all means of transit under public and private direction. Such action has turned out well in Boston, though on a somewhat different plan of organization. It is to be hoped that an equally satisfactory result will be obtained in New York.

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Attacks on Commissions a Growing Menace

LEW SHANK, Mayor of Indianapolis, addressed a mob from the steps of the State House in Indianapolis, Ind., a few days ago. The subject of his address was an attack upon the Public Service Commission. As an isolated example of a political diatribe his remarks about the commission would properly merit no greater notice than any other grand stand play to the populace. But they are not an isolated example. Similar attacks upon commission rule are reported from New Jersey by Governor Edwards and from California by Governor Stephens.

In the case of Governor Edwards that executive, in the special message to the Legislature, asked the repeal of the commission legislation and a return to home rule and a 5-cent fare. Although Governor Stephens said nothing derogatory of the California commission or of the method of commission regulation, he did seek to interfere in recent rate cases by pleading directly with the commission to reconsider the evidence on which the commission based its rulings. Whether or not Mr. Stephens had his political ear to the ground, the suggestion which he made to the effect that the public was expecting rate deflation was, to say the least, needless meddling in the affairs of a body set up by the State in a quasi-judicial capacity to do justice to all the interests involved. As indicated before, the case of Mayor Shank as an isolated example might properly be dismissed for the grand stand play that it was, but there is grave danger ahead in the manifestations of meddling in the cases of Governors Edwards and Stephens, even though the appeals of these executives fall upon deaf ears.

Commissions are not infallible. Commission rule is not always all that it should be. But the commission plan of regulation is the best that has so far been conceived for settling the vexed problems of administering the affairs of the corporations in the interest of the public. These public regulatory bodies, as pointed out in the ELECTRIC RAILWAY JOURNAL of Feb. 11, are a natural development, just as were the courts of equity. If the work of the commissions or the functioning of them is to be governed by the political whim of the hour, then return to the Dark Ages is in prospect in so far as the utilities are concerned. The present commissions with their broad powers over construction, accounting, financing, rates and service were, as is well known, created because of the total or partial failure of the older forms of regulation. But apparently some are forgetting this fact; and as *Public Utilities Reports* for Jan. 5 indicates, the need now exists for vigilance in preserving the good results that have redounded to the public and the utilities through the agencies for regulation which have been built up. The editorial "What Produced the Commissions" in that paper is an able statement of the case in favor of the commission form of regulation and the ELECTRIC RAILWAY JOURNAL finds itself in full accord with the ideas therein expressed that the present need is for strengthening rule by commission by assisting in preserving the present general high standing of such commissions.

It may be that *Public Utilities Reports* is correct in its conclusion that the attacks so far made on the commissions have left those bodies stronger than ever, but there is need constantly to be on guard lest interference such as that of Governor Stephens and the plausible plea such as that by Governor Edwards shall work to the detriment of public regulation by increasing distrust even if it does nothing more. As Arthur W. Brady, president of the Union Traction Company of Indiana, felt called upon to explain in a recent speech at Muncie, Ind., commissions when judged from the public standpoint have three objects and three only: (a) To insure reasonable and just rates by the utilities; (b) to require the furnishing of reasonably adequate service and facilities by the utilities; (c) to prevent unjust and unreasonable discrimination by the utilities. When these objects are attained the public needs are satisfied and the public rights protected. The inherent right rests with the utility, of course, to demand that regulation shall not deprive it of the opportunity to earn a reasonable return on the fair value of its property. This is a right not even referred to in the acts creating the commissions. It is conferred by state and federal constitutions.

It was the attempt to exercise this right by appeal to the courts by the Public Service Railway in New Jersey from a commission decision that prompted the special message of Governor Edwards to the Legislature. The mere observance and protection of this right is not, however, enough to meet public or corporate needs. As Mr. Brady has recently pointed out and as others have indicated before, capital cannot be procured and improvements carried out unless the utility is accorded such treatment with respect to rates and practices that it may compete for capital in the money market on an equality with other business subject to like risks. In the last analysis the public can take out of a utility only what it has previously put into it. The measure of its support of the utility is the measure of service which the public may expect. A utility can no more live with impunity beyond its means than can an individual.

Selling Tickets to Banks for Ready Cash

THERE never has been, nor can there ever be, a set rule as to the commercial value of selling single-ride tickets at cut rates. The conditions may not be such as to lead to a decided stimulus to riding; or the increase in riding may be offset by the combination of lower income per ride and greater difficulty in checking the conductor's returns. However, there is one advantage about the ticket that does not seem to be exploited to any extent, namely, to secure cash in advance.

When tickets are sold through conductors and stores, they are issued on a credit basis, so that the railway gets its money no faster than from cash fares except for bigger sales on pay days. In fact, it has a lot of extra accounting to worry about. A rather different procedure was adopted by a company which, having retained a basic 5-cent fare, cannot sell tickets for convenience reasons but only on a bargain basis. It happened to need some thousands of dollars cash right off the reel. To borrow short-term money at high rates was most distasteful. The manager, however, had a happy thought. He visited the local banks and asked them if they would be willing to favor him to this extent: Pay in advance for several thousand dollars worth of tickets and then offer them for sale to the usually thrifty people that patronize banks. He would, of course, see that their names were liberally advertised on the ticket-selling car placards. The offer was accepted—a high compliment to the belief in the permanence of the electric railway in question!

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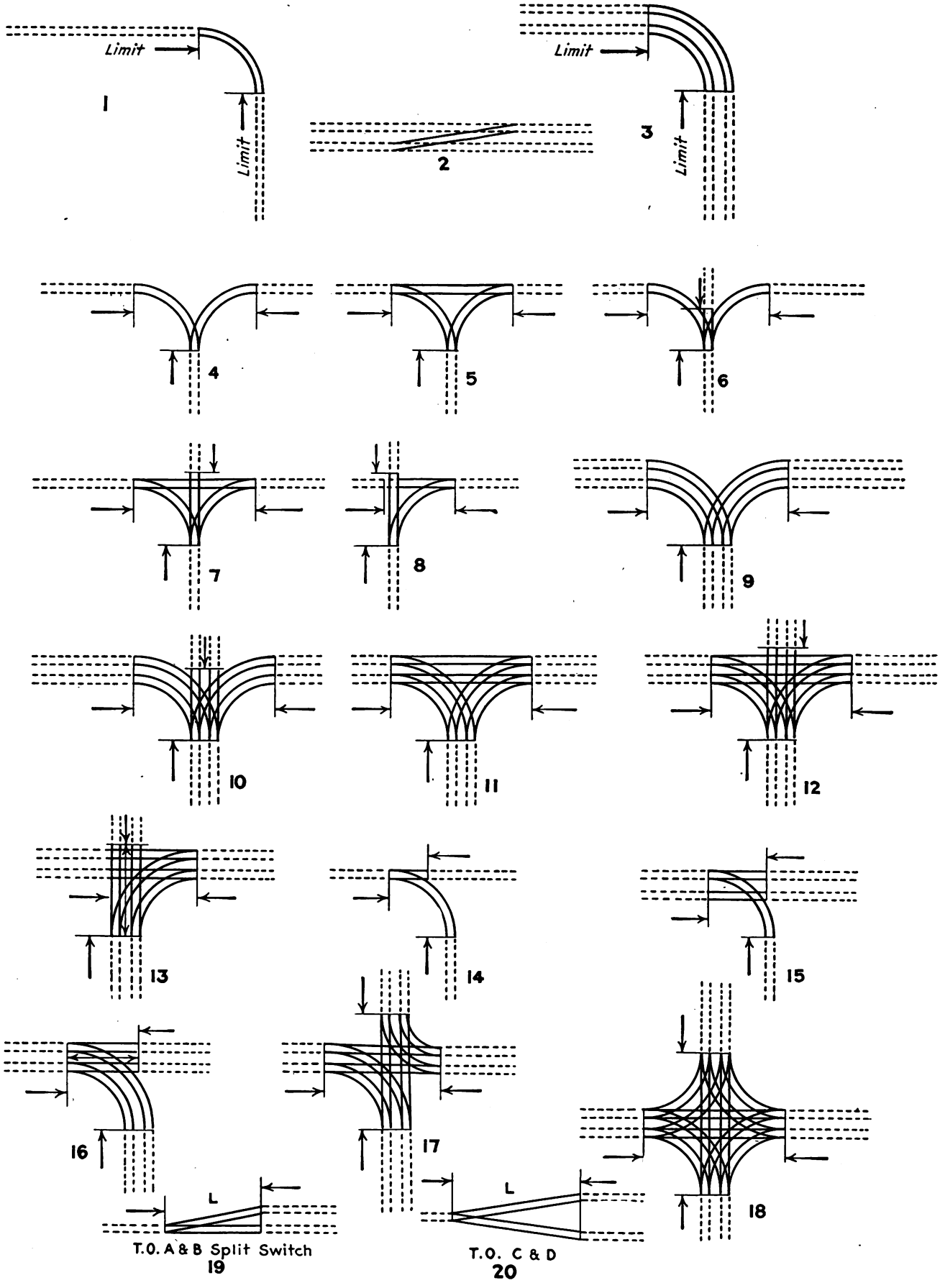
Various Types of Special Trackwork Layouts Used in Unit Method of Valuation



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A Method of Valuation of Railway Special Trackwork

Unit Costs of Various Special Trackwork Types Are Set Up—Method Particularly Applicable to "Yard-Stick" Valuations of Electric Railway Properties*

BY JOSEPH E. RAPUANO
Maintenance of Way Department, the Connecticut Company, New Haven, Conn.

PRESENT-DAY demands upon public utilities, calling for frequent and quick valuations for rate purposes, have created the necessity of resolving a complete valuation into its component parts, so that, by treatment independent of one another, more help can be utilized and consequent expedition obtained. This article deals with the methods employed by the Connecticut Company in arriving at a fair reproduction value of its special trackwork. It is felt that there are many points of interest in this special trackwork valuation inasmuch as it was carried out independently of the rest of the valuation, and thus necessitated thorough co-operation on the part of all concerned.

The item of proper segregation as between special and non-special trackwork was carefully considered, and adopted as the one most likely to comply with the desired requirements. The fair values thus obtained, although not strictly representative for each special layout, are nevertheless quite representative of the fair reproduction value of all the special trackwork as a whole, the value generally regarded in rate fixing.

A preliminary investigation of office records showed a Track Statement giving in great detail the character of the track construction with distances between special trackwork layouts. A special index map book also showed special trackwork locations by means of serial numbers referring to individual detailed plans of each special trackwork layout, from which plans all necessary data were taken for pricing purposes.

The next question was how best to proceed with the

TABLE I—FORMS FOR VALUATION OF VARIOUS TYPES OF LAYOUTS

a = Form for specials and turnouts. Item and Details	Reproduction Value	Notes
Rail	$4,395.44	Loc. No. 60, New Haven Division
Ties (290 at 65 cents)	188.50	Double track connected branch-off with crossings
Ballast (3½-in. gravel) 41 cu. yds. at 60 cents	24.60	7-in., 95-lb. T. and 7-in., 110-lb. G.
Track laying (20 per cent of $4,395.44)	879.09	3 cast welds at $21 = $63.00
		4 sws. at $165 = 660.00
Grading (189 cu. yd. at $1.75)	330.75	4 mates at $115 = 460.00
Pavement { 395 sq. yd. wood block at $3.20 }		27 frogs at $100 = 2,700.00
Pavement { 15 sq. yd. brick at 2.60 }	1,303.03	68-ft. of S.T. at $1.13 = 76.84
		198-ft. of S.T. at $2.20 = 435.60
Total cost of layout	7,121.41	$4,395.44

b = Form for crossovers. Item and Details	Reproduction Value	Notes
Total cost of crossover	$796.00	Loc. No. 53. Waterbury Division
Cost of rail displaced (57 ft. of S.T. at $1.13)	64.41	Crossover rail = 7-in., 95-lb. T. and 7-in., 110-lb. G.
Net excess cost of crossover	731.59	Main line rail displaced = 7-in., 95-lb. T.
Cost of excess ties (10 at 65 cents)	6.50	
Cost of excess track laying (10 per cent of $731.59)	73.16	
Total excess cost of crossover	811.25	

c = Form for curves. Item and Details	Reproduction Value	Notes
Total cost of special curves	$1,210.40	Loc. 30½. Norwalk Division
Cost of same length of ordinary rail (512 ft. at $1.13)	578.56	512 ft. of single track 7-in., 95-lb. T and 7-in., 110-lb. G.
Excess cost of special curves	631.84	Main line rail displaced = 7-in., 95-lb. T.
Excess cost of track laying (512 ft. at 15 cents)	76.80	512 ft. at $2.20 = $1,126.40.
Total excess cost of special curves	708.64	4 cast welds at $21 = $84.00.

d = Form for crossings. Item and Details	Reproduction Value	Notes
Total cost of crossing	$1,077.12	Loc. No. 19. Bridgeport Division
Cost of displaced length of ordinary rail (24 ft. at $1.13)	27.12	Double track trolley across single steam.
Excess cost of crossing rail	1,050.00	Crossing rail = 7-in., 110-lb. G.
Excess cost of track laying (24 ft. at $1)	24.00	Main line rail = 7-in., 95-lb. T.
Total excess cost of crossing	1,074.00	24 ft. of 7-in., 95-lb. T. displaced = Trolley portion.

limits were established, to assure consistent treatment of all types of special trackwork layouts. Prices used were those of 1910-1915 inclusive, as adopted by the Public Utilities Commission in its appraisal of the system. Wherever actual costs as of 1910-1915 were available for any layout, they were used; elsewhere average unit prices prevailed as determined from "The Massachusetts Public Service Commission's Valuation Report of Street Railway Properties in Massachusetts, June, 1916," and from data furnished by the local maintenance of way department. In arriving at the results obtained, both the shortness of time available for the work and the cost of a more minute inventory were considered; and the procedure here outlined was valuation so as to co-operate with those working on the tangent track values. Since the latter were using distances shown on the Track Statement, and since these distances carried through special curves, both single and double track, crossovers and crossings, but skipped all other special trackwork layouts, it was deemed necessary so to valuate special curves, crossovers and crossings that the values obtained would only show the additive cost of the work over that of ordinary tangent track, single or double, as the case might be. This precaution obviously prevented the same piece of track being valued, first, as ordinary tangent track, and then again as special trackwork. All other special trackwork layouts were valuated completely, inasmuch as they could not be mistaken for tangent track and so valuated. Forms for the valuation of each type of layout were accordingly prepared and are shown in Table I, *a*, *b*, *c*, *d*.

*In the ELECTRIC RAILWAY JOURNAL issues of May 21 (page 947) and May 28 (page 985) the general method of valuation of the Connecticut Company's property was outlined in some detail. Mention was there made of the separate valuation of special trackwork. The present article by Mr. Rapuano gives the details of the special trackwork valuation.—EDITORS.

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The various types of layouts encountered are shown on page 264, as are also their corresponding limits for valuation. In turnouts, the limits are the switch joint and a point where the tracks reach full centers. In single track branch-offs, the limits are the switch joint and end of the frog-arm on the main line, and the end of the special rail of the branch-off itself. In all other layouts, the limits are obtained by using the extreme ends of the special trackwork on one track, generally the switch joint and end of frog arm, and squaring off from these points onto the other track. This treatment causes some ordinary tangent track rail to be included, which, of course, must be given unit price for that kind of rail.

Realizing that the cost of any layout is the sum of the costs of its component parts, tables were prepared showing average costs of switches, mates, frogs and special rail. These tables covered all types of rail but were not lengthy, due to the fact that where there was very little difference between the costs of two or more types of rail the same unit price was used for the group. Consequently shorter tables resulted with no loss in the efficiency of the results obtained. In setting up these unit values, due consideration was given to the type of construction, as to whether it was "ironbound hard center," "bolted insert work," or "built-up." In adopting these average unit prices, all switches were assumed 12 ft. long, except split-switches, which were taken as 15 ft. in length. Spring frogs, and built-up frogs, used with split-switches, were assumed 15 ft. long; all other frogs 8 ft. long.

A table was prepared showing the cost per foot of single track for each type of ordinary tangent track rail, and this table, together with the one mentioned above for special rail, gave the necessary data for curves, crossovers and crossings.

Wooden ties were figured as 6 in. x 8 in. x 8 ft. at 65 cents each, while shell steel and twin concreted steel ties were taken at $2.50 and $4 each, respectively.

Track laying was figured both as a percentage of the total rail cost and as a price per foot of track. The percentage basis was arrived at after a careful consideration of the actual costs at various special trackwork layouts.

Ballast was either gravel or stone, or a combination of Telford and stone, or Telford and gravel. Values used per cubic yard were $1.20 for stone; 60 cents for gravel; $1 for Telford and stone; 70 cents for Telford and gravel; and $5 for concrete sub-foundation. To facilitate matters, a table was prepared giving the amount of ballast in cubic yards as a function of the surface area of the layout for each depth of ballast.

All grading was reduced to three types; and a table was prepared showing the amount of grading, for each height of rail, as a function of the total surface area of the layout. (See Table II.) The corresponding prices used for the three types of grading showed grading in ordinary earth, gravel or sand at 80 cents per cubic yard; grading in macadam, bituminous macadam, granite block or cobble on earth foundation at 90 cents per cubic yard; all other grading at $1.75 per cubic yard, due to the presence of a hard base underneath the pavement.

The yardage of pavement was obtained by means of a planimeter from the detailed plans of the layouts and where more than one type of pavement was present in the same layout measurements were taken in the field to determine the amount of each. Table III gives the various types of pavement encountered and the corresponding prices per square yard.

Special Curves.—As stated before, all special curves were so valuated that only their additive cost over ordinary tangent track was recorded, the items affected being rail and track laying. The total length of curves figured as single track was obtained from the detailed plans, and from tables, prepared to show cost per foot of all types of special rail and ordinary tangent track rail, it was an easy matter to obtain the desired result.

Crossings.—All crossings were treated the same as special curves; that is only their additive cost, over ordinary tangent track displaced, was considered. Here also, only the items of rail and track laying were affected. After careful examination of records, it was found that the allowance of $1 per foot of single track displaced by the crossing would very nearly represent the excess cost of the track laying over the cost of the same item per foot of ordinary tangent track displaced. The actual costs of most of the crossings were available, but in the few cases where this was not the case, the law of averages was applied.

Crossovers.—Values shown under crossovers likewise

TABLE II—TABULATION OF GRADING IN CUBIC YARDS FOR DIFFERENT RAIL HEIGHTS

	Amount of Grading in Cu. Yds. — A = Surface Area in Sq. Yds.			
Rail Height	3½-in. Ballast	6-in. Ballast	6-in. Concrete Sub-Foundation + 6-in. Ballast —Hartford Div.	11-in. Telford Base
6 in.	0.43 A	0.50 A	0.67 A	0.64 A
7 in.	0.46 A	0.53 A	0.69 A	0.67 A
etc.	etc.	etc.	etc.	etc.

TABLE III—PRICES PER SQUARE YARD OF THE VARIOUS TYPES OF PAVEMENT

Symbol	Description of Pavement	Cost Per Sq. Yd.
P	Asphalt on 6-in. concrete	$2.14
P_1	Topeka on stone	1.00
P_2	Bicomac on hassam	1.75
P_3	Asphalt on hassam	2.50
Y	Plank	2.34
Y_1	Wood block on 6-in. concrete	3.20
Y_2	Wood block on plank	4.30
Y_3	½-in. asphalt on 6-in. concrete	2.55
R	Granite block on 6-in. concrete	3.42
R_1	Granite block on earth	2.25
R_2	Cobbles on earth	0.60
S	Macadam	0.70
S_1	Bituminous macadam	1.10
T	Brick on 6-in. concrete	2.69
T_1	Brick on plank	1.86
T_2	Brick on 5-in. concrete	2.55
T_3	Brick on stone	1.86
T_4	Brick on gravel	1.86
V	Earth fill	....
V_1	Gravel fill	....
V_2	Sand fill	....
W	6-in. concrete	1.25
W_1	6-in. granitoid	2.30
W_2	4-in. hassam	1.25
W_3	6-in. hassam	1.61
X	Amiesite on stone	1.28
X_1	Amiesite on 6-in. concrete	2.18
X_2	Bithulitic on 6-in. concrete—wood block headers	2.75
P_4	Asphalt on 6-in. concrete—wood block headers	2.75

TABLE IV—NUMBER OF TIES AND AREA OF EXCAVATION FOR DIFFERENT TYPES AND LENGTHS OF TURNOUTS

Type and Length of Turnout	Number of Ties	Surface Area in Sq. Yds.
A—67 ft.	64	105
B—93 ft.	86	148
C—51 ft.	56	74
D—67 ft.	72	106
No. 6 Frog—110 ft.	96	173
No. 7 Frog—124 ft.	108	195
etc.	etc.	etc.

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show only the additive cost of the work over that of ordinary tangent track displaced. Here the items affected are those of rail, ties and track laying. The excess track laying was taken as 10 per cent of the excess cost of rail in tongue switch and mate work, and 20 per cent in the case of split-switch work, where most of the rail bending and cutting was done in the field. A table was prepared showing the total cost of crossovers for each type of rail and the cost of the ordinary tangent track rail displaced, so that by subtracting one item from the other, the additive cost of the crossover rail was obtained. A table was also prepared showing the additive number of ties required for each length and type of crossover over the number ordinarily required for the same length of tangent double track. By the use of this table the item of excess ties became a very simple matter.

Cast Welds.—All cast welds were assumed at $21 each. This price was used throughout all the layouts where cast welds made their appearance.

Turnouts.—The different turnouts were valuated so as to show the total cost of the work, and in order to simplify matters they were all reduced to four types: "A," "B," "C" and "D" in the case of tongue switch and mate work. The types "A" and "B" represent side-turnouts 67 ft. long and 93 ft. long respectively, with radii of 100 ft. and 200 ft.; while "C" and "D" represent diamond ends 51 and 67 ft. long respectively with radii of 100 ft. and 200 ft. The length of a turnout represents the distance from switch joint to a point where the two tracks reach full centers. Split-switch turnouts were designated by their length from switch point to full centers and so all turnouts on the system were made to come under the above general types, in order to make all practical headway. The items affected under turnouts are: Cost of rail, ties, track laying, ballast, grading and pavement. The value for rail was arrived at by using the values for switches, mates and frogs shown by a prepared table and then adding the cost of the remaining rail. A table was also prepared showing the number of ties used and total surface area excavated in square yards for each type and length of turnout. (See Table IV.) From this table the number of ties, and the amount of ballast and grading, both a function of the surface area excavated, were ascertained and the cost thus figured by the application of unit prices. The pavement item was similarly obtained.

Special Layouts.—All other layouts not yet mentioned were classed as special layouts. In these cases the total cost of the work was obtained in every case rather than mere additive cost over tangent track. The limits of the special trackwork of this kind are also shown on page 264. In the case of double track branch-offs, where the special trackwork begins at a switch joint, or point, on the first track, the corresponding limit of the work on the second track was obtained by squaring across from the limiting point on the first track regardless of where the switch joint, or point, occurs on the second track. This process caused some ordinary tangent track rail to be included, the price of which, however, was assumed the same as for ordinary tangent track. The value for rail was obtained by using the figures for switches, mates and frogs, as shown in the prepared table mentioned above, and adding to them the cost of all ordinary rail and the cost of the remaining special rail, as so much per foot of single track, as shown by prepared tables. Rail in single track branch-

TABLE V—FINAL REPRODUCTION COST FIGURES OF SOME OF THE TYPES OF SPECIAL TRACKWORK LAYOUTS

Layout	Identifying	Cost to Reproduce							Notes †
		Rail	Ties	Track Laying	Grading	Ballast	Pavement	Total	
200 radius left hand turnout..	19	$534.00	$56.00	$80.00	$119.00	$9.00	$474.00	$1,272.00	7-ft., 95-lb. T-Rail, wooden ties, 3½-in. gravel ballast, wood block on concrete.
Single track branch-off.....	14	$642.00	$40.00	$100.00	$86.00	$7.00	$229.00	$1,104.00	7-ft., 110-lb. G-Rail, wooden ties, 3½-in. gravel ballast, asphalt on concrete.
Single track "Y".....	4	$782.00	$87.00	$117.00	$164.00	$25.00	$220.00	$1,395.00	4½-ft., 56-lb. T, wooden ties, 41 cu. yd. gravel ballast grading, 32 yd. at 80 cents, 79 at $1.75, pavement 176 yd., concrete 72 earth fill.
Single track three part "Y" with crossing.....	7	$2,526.00	$114.00	$505.00	$200.00	$15.00	$647.00	$4,007.00	7-ft., 110-lb. G, wooden ties, 3½-in. gravel ballast, brick on concrete.
Single track three part "Y"....	5	$1,508.00	$117.00	$302.00	$115.00	$19.00	$720.00	$2,781.00	5-ft., 80-lb. T, wooden ties, 3½-in. gravel ballast, granite block on earth.
Double track branch-off.....	16	$1,683.00	$120.00	$337.00	$153.00	$22.00	$833.00	$3,148.00	7-ft., 95-lb. T and 7-in., 110-lb. G, wooden ties, 3½-in. gravel ballast, granite block on earth.
Double track three part "Y" with crossings.....	12	$6,470.00	$221.00	$1,294.00	$382.00	$28.00	$1,472.00	$9,867.00	7-ft., 110-lb. G, wooden ties, 3½-in. gravel ballast, 20 yd. brick on concrete, 444 yd. wood block on concrete.
Double track through "Y".....	10	$3,316.00	$169.00	$663.00	$363.00	$29.00	$1,410.00	$5,950.00	7-ft., 110-lb. G, wooden ties 3½-in. gravel ballast, 60 yd. macadam, 420 yd. wood block on concrete.
Double track three part "Y"...	11	$5,344.00	$325.00	$1,069.00	$745.00	$55.00	$2,960.00	$10,498.00	7-ft., 110-lb. G, wooden ties, 3½-in. gravel ballast, wood block on concrete.
Double track connected branch-off with crossings.....	13	$4,395.00	$188.00	$879.00	$331.00	$25.00	$1,303.00	$7,121.00	7-ft., 95-lb. T, 47-in., 110-lb. G, wooden ties, 3½-in. gravel ballast, 395 yd. wood block on concrete, 15 yd. brick on concrete.
Single track connected branch-off with crossing.....	8	$1,905.00	$75.00	$381.00	$243.00	192.00	$396.00	$3,192.00	9-ft., 125-lb. G, wooden ties, 31 yd. stone ballast, 31 yd. concrete ballast base, asphalt on concrete.
Grand union.....	18	$13,375.00	$585.00	$2,675.00	$1,510.00	$1,190.00	$2,460.00	$21,795.00	9-ft., 125-lb. G and 9-in., 151-lb. G, wooden ties, 192 yd. stone ballast, 192 yd. concrete ballast base, asphalt on concrete.
Split Switch T.O., No. 8 Frog-Length 136-ft.....	19	$336.00	$77.00	$67.00	$69.00	$13.00	.....	$562.00	5-ft., 80-lb. T, wooden ties, 3½-in. gravel ballast, earth fill.

All work "bolted insert work" unless otherwise mentioned. * The numbers in this column refer to the types of layouts shown on page 264. † G in last column stands for girder.

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offs was given the price of special rail in the case of tongue switch and mate work, and the price of ordinary tangent track rail in the case of split-switch work, where the added cost of curvature was taken care of by an increase in the track laying item. The number of ties was estimated in each case and averaged between 60 per cent and 90 per cent of the total length of the work figured as single track, depending upon the nature of the layout. The track laying item was assumed as 15 per cent of the total cost of the special trackwork, in the case of single track branchoffs of tongue switch and mate work, and 20 per cent in all other types of special layouts. The items of ballast and grading, both functions of the surface area of the excavation for the layout, were easily calculated and priced. This area was obtained, as mentioned before, by the use of a planimeter on the detailed plans of the different layouts. The pavement also was readily priced, except where more than one type occurred in any one layout. If this was the case, measurements and estimates were made in the field to determine the proportions of each.

Carhouses, Sidings and Spurs.—The values of special trackwork at carhouses, sidings and spurs also represent the total cost of the work. The treatment was the same as for special layouts, except that more attention had to be paid to the field work of inspecting to determine the nature of the construction, which in most cases was found to be of the "bolted" or "built-up" type, minus the hard center qualities. Here again some of the rail was given the price of special rail and some that of ordinary tangent track rail, depending upon whether it was shop bent, or bent in the field, and wherever the latter was the case, the price for ordinary tangent track rail was applied, with a corresponding increase, however, in the track laying item.

Advantage of Good Office Records Demonstrated

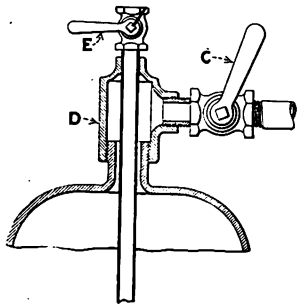
From the above it is obvious that the better the office records the less the amount of field work to be performed, and consequently a saving in time must be the result. The writer found it of great advantage to prepare the valuation forms for all special trackwork locations beforehand, so that when the track statements were gone over, some of the items, such as types of rail, depth and kind of ballast, and grading, and kind of pavement, could be recorded on each form, leaving only the computations of the amounts under each item. These were readily obtained from the detailed plans of each location.

The most helpful instrument during these calculations was the planimeter, by means of which the surface area of each layout was obtained; and since both the grading and ballast items were taken as functions of this surface area found, one can readily note the saving in time and effort afforded by the use of the planimeter. The only field work left to do was that of determining the proportions of each kind of pavement in layouts where more than one type was present, and the previously mentioned inspection of carhouse layouts and spur tracks, where detailed plans of the work were not always available.

In concluding, the writer wishes to emphasize that in a valuation of this kind carefully prepared tables and a systematic method of procedure, both in the matter of keeping office records and in the valuation itself, are the real keys to a substantial saving in both time and money.

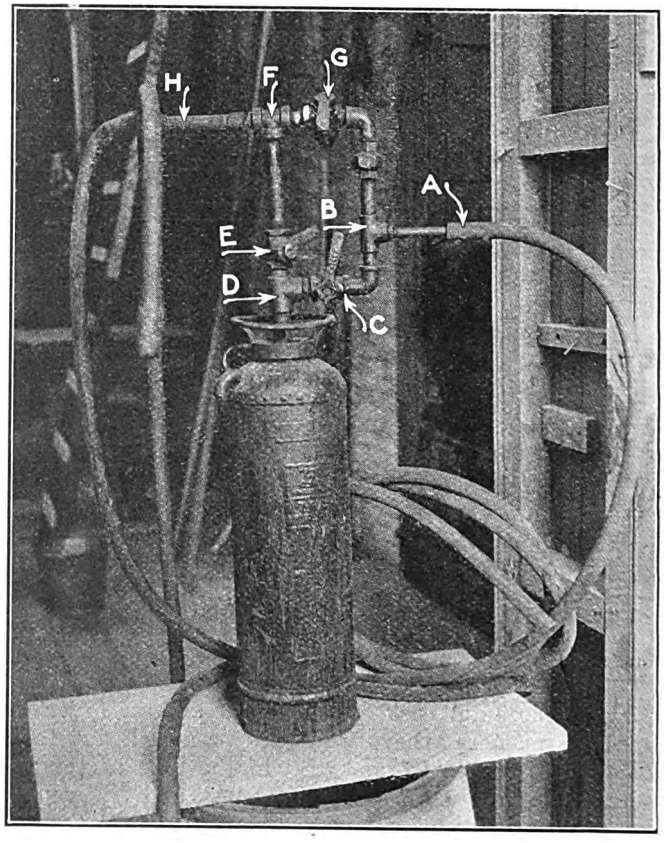
Paint Spraying Equipment Made from Discarded Fire Extinguisher

THE Second Avenue Railroad, New York, had a number of trucks that required repainting and Charles E. Chalmers, receiver for the railroad, conceived the idea of using an old fire extinguisher to assist in and speed up this work. Accompanying illustrations show the equipment as constructed. All that was necessary was to connect up the piping so as to provide for attachment to the shop air system and connect in the various cut-out cocks for controlling the air and spraying operations.



AIR AND PAINT CONNECTIONS TO FIRE EXTINGUISHER TOP

Referring to the accompanying halftone, the hose on the right marked A is for attachment to the shop's air system, while that on the left marked H is used for spraying the paint. In operating the equipment the valve at C is first opened, which admits air pressure to the top of the paint contained in the fire extinguisher body. A small pipe runs to the bottom of the fire extinguisher and is connected to the valve so that when pressure is applied to the top the paint rises in this pipe and by opening the valve E the paint will flow through the connections at F and H. In order to give air pressure for the spraying of the paint the valve at G is regulated as desired. The line drawing shows the attachment of the pipe which goes to the bottom of the paint receptacle and the method of admitting air to the top of the receptacle. The fire extinguisher body has sufficient capacity to hold 2 gal. of paint.



HOME-MADE PAINT SPRAYING EQUIPMENT

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Insuring Accuracy in Trackwork Estimates

Engineering Department of Pacific Electric Railway Has Developed a System Which Insures a Supply of Accurate Cost Data to Field Engineers and Eliminates Lost Motion in the Cost Department

BY CLIFFORD A. ELLIOTT
Cost Engineer Engineering Department, Pacific Electric Railway, Los Angeles, Cal.

SINCE 1919 the engineering department of the Pacific Electric Railway has used a printed form for estimates of work on tracks. This was prepared for the convenience of the field engineers' bureau, where all such estimates are prepared. It is shown in Fig. 1.

The system involving the use of this form was designed to provide a consistent estimating standard and to include every detail item essential to a standard estimate. Now, when the estimate is accepted and turned over to the work order bureau of the engineering department for the preparation of the work order this bureau can do its work promptly. Otherwise, there might be delays due to necessary interviews with the field engineer, the author of the estimate, with requests for explanations on points not clear to the accountants in the work order bureau. Such lack of clearness might have been due to the field engineer's lack of attention to required details. While under the present plan there is no desire to make an accountant of the engineer, the plan makes it his duty to furnish and list every detail that will assist the accountant in his work of taking the estimate apart for work order purposes.

The present estimating system expedites the work of every one concerned. The details as supplied by the estimator aid the office engineer in promptly reviewing the figures and passing them along to the chief engineer for consideration and for approving the issuing of the work order.

The estimates are written out in pencil. Triplicate copies are made, one copy being retained in the field engineering bureau and two transmitted to the chief engineer's main office. When the estimated cost of a proposed project is transmitted to the management, total figures are used only, but detail figures are furnished if requested. Space is provided on the form for features not covered under the printed headings. For example, if the estimate covers a replacement job, the salvable material can be listed and classified by the estimator. Again, culvert and street improvement plan references as prepared by municipality engineers are shown when the estimate covers a reconstruction and paving job. This plan also provides a method for dividing the expense of a project with outsiders, as for instance in the construction of an industrial spur track where a portion of the expense is borne by the industry served. With reference to the grading item, sometimes the industry desires to do the grading for the spur, as it may have a grading outfit available for the construction of its warehouse which would lower the grading cost if this work is done at the same time as the warehouse work. In this instance the estimator merely indicates the yardage of the company's grading and indicates the grading for the industry's portion, but gives no unit cost or total grading cost for the outsider. In the "remark" column he states, for example, "Industry to perform grading from the north line of 35th Street to end of spur."

Form MW-4 2M-9-20

PACIFIC ELECTRIC RAILWAY COMPANY

TRACK ESTIMATE

Line and Location ..... Kind of Track .....
Purpose ..... Date ..... Drawing Reference .....
Estimate Basis ..... Ft. Company ..... Ft. Industry ..... Ft. Private Ownership ..... Ft. Total ..... Ft.
Statement of Conditions .....

MATERIAL	RATE	COMPANY	INDUSTRY	REMARKS
Special Work				
Special Work				
Special Work				
Rail				
Rail				
Fences				
Transportation of Men				
Franchise & R R Com Survey				
Total Labor, Misc., Etc				
Contingencies				
Grand Total				Correct

FIG. 1—TRACKWORK ESTIMATE FORM, PACIFIC ELECTRIC RAILWAY

General items: Line and location; kind of track; purpose; date; drawing reference; estimate basis (in feet) for company track, industry track, private ownership track, and total; statement of conditions.

The following items are tabulated: Special trackwork, rail, joints, compromise joints, bolts, tie plates, rail braces, nut locks, guard rails, separators and bolts, spikes, derails, bumpers, track bonds, track cross bonds, numbers and kinds of signs, ties, special trackwork timbers, total of above, store expense, ballast, total material, grading, trackwork (new construction), trackwork (remove or shift), placing special trackwork, placing bumpers, ballasting (including grouting), bonding, paving (new work), paving (excavating old work), culverts, bridges, structures (new), structures (changes or removals), work-train service (track), work-train service (ballasting), freight on track material, freight on ballast, transportation of men, franchise and railroad commission survey, total labor, miscellaneous, etc., contingencies, grand total. Listed also are companion work orders, 1, 2, etc.

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When the item of ballast enters into a track estimate, depth and class may be stated. Where there are items of structures or culverts that involve considerable structural study and plans, then the individual engineer who furnishes such figures for incorporation in the estimate is quoted; that is, a note is made at the side of that figure that it was furnished by the person whose name is stated.

The same practice is followed when there is an unusual item of cost required in the estimate, such as a large layout of solid manganese special trackwork.

Another illustration of the use of the form for recording additional data is this: When overhead construction figures are required on any track project, the estimator, when he begins to make his estimate, immediately fills out a standard printed form of letter request on the electrical superintendent, stating that "as per an inclosed drawing," a certain track construction is proposed and that the estimated cost of the overhead construction or changes is required. When the overhead construction figures are received they are added to the total of the track estimate. The bonding of the track is estimated in the field engineering bureau.

This bureau, also, when turning in its estimates to the chief engineer, always incloses and refers to a drawing prepared by the field engineers to accompany all estimates from the bureau. When the work order is prepared, this field drawing is used by the drafting department in preparing a standard 8½-in. x 13-in. blueprint plat that "supports" the work order transmitted to the management. On one corner of the work-order blueprint plat is always shown a marginal location map of a portion of the railway system.

ACCURATE COST DATA USED AS A BASIS FOR ESTIMATES

This system of estimating involves dependable cost-keeping records. The unit costs are furnished the field engineers for their cost books whenever the costs of performing similar work are known to have changed. At a certain period of the year the cost engineer supplies any changes in the unit cost for installing turnouts, track laying, placing of ballast, or any other items of cost that are essential for preparing conservative estimates. For instance, a weighted average is arrived at on the number of hours time of foreman and laborers to install a turnout. Fifteen examples are taken and the result of the time engaged per turnout by the existing average rate of pay determines a standard cost for this one particular item. This rate remains the same until there is a change in the wages paid.

To secure information as to material prices, tracing cloth sheets or vellum paper 14 in. by 18 in. in size were ruled in the drafting room as shown in Fig. 2. Then a list of all classes of material used in estimates was typewritten on these sheets, a sheet of carbon paper being used to impress the writing on the back of the sheets so as to facilitate printing. Brown negatives made from these sheets are transmitted to the auditor on the first of each month and he is requested to insert the current monthly prices of the material in the columns provided. He is supplied with drafting-room copying ink and is instructed to write in the prices with heavy lines to insure good printing qualities of the sheet. Blueprints are made from these sheets, of which six or seven form a set, and each assistant engineer involved in making estimates is supplied with a set. As a new set is supplied each month with the current month's prices, the engineers can compare prices with previous ones to determine the correctness of their estimates. With respect to prices on material not in store stock but on order, such as the year's rail, rail fittings, tie and special work requirements, the stores department furnishes a monthly statement of all rail and rail fittings on hand or the quantity on order. Then the field engineer, in estimating, can determine whether he is estimating on material in stock at current prices or material on order.

For materials on order the engineers are given a circular every three months or every six months, stating the costs of these materials. Thus an engineer may make an estimate for the construction of a line extension, and knowing that it will be six or eight months before the line will be constructed, if at all, he may use in his estimate prices on rail and fittings based on supplies on order.

-PRICES OF MATERIAL FOR ESTIMATING PURPOSES IN ENGINEERING DEPARTMENT-
AND FURNISHED MONTHLY BY THE AUDITOR - PACIFIC ELECTRIC RAILWAY CO:

SHEET #1. YEAR 19____

CLASS	UNIT	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	WT.
ANTI-RAIL CREEPERS 60#	EA													3#
ANTI-RAIL CREEPERS 70#	EA													3#
ANTI-RAIL CREEPERS 75#	EA													3½#
BARS, ANGLE S.H. 50#	PR													18#
FROGS, RIGID No.5 - 75#	EA													756#
FROGS, RIGID No.7 -75#	EA													995#
FROGS, RIGID No.7 - 91#	EA													1,472#
FROGS, RIGID No.7 - 127#	EA													1,335#
FROGS, SPRING No.7 - 60#25	EA													1,064#
FROGS, SPRING No. 7 - 70#	EA													1,276#

FIG. 2.—CHART FOR PRICES OF MATERIAL FOR ESTIMATING PURPOSES IN ENGINEERING DEPARTMENTS AND FURNISHED MONTHLY BY AUDITORS, PACIFIC ELECTRIC RAILWAY

On the form furnished to the auditors, unit prices are called for on anti-rail creepers, 60-lb., 70-lb., and 75-lb.; second-hand angle bars, 50-lb. and 70-lb.; new angle bars, 60-lb., 70-lb., 72-lb., 75-lb.; track bolts, of various sizes ranging from ⅞x3½ in. (244 bolts per keg) to 1x5½ in. (100 bolts per keg); machine bolts of various sizes, rail braces of several sizes, cement, etc., ranging through all of the items involved. The items are arranged alphabetically. Six or seven sheets form a set.

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The following provision is made for conservative estimating on special trackwork to be used on a job, such for example as a split-switch or switch-and-mate layout that is not of standard design, but of special-radius type, and not in stock: At certain periods of the year, or as conditions and prices may change, the field engineers are supplied by the cost engineer with the weighted average of the cost per pound for shop-made special trackwork layouts; also, the weighted average of costs of solid manganese layouts secured from the East. With this unit cost at hand the estimator, from his special trackwork drawing or from one of a similar layout previously designed and on file, can calculate the weight of the proposed layout and arrive at a conservative cost figure in his estimate for such classes of special trackwork as it is necessary for him to include.

For use in estimating bonding work costs in any track estimate, during certain periods of the year, as material and labor prices change for this class of work, an estimate sheet of the cost of material and labor for bonding of a switch, a railroad crossing, a mile of track, open type and girder-rail type in paved streets, etc., is compiled. This is neatly typed and bound, and is supplied to the field engineers. The bonding estimate is made up in complete detail so it fits into the items listed on the track estimate form.

Checking Up the Estimates

As to such items of cost, required for estimates, as those of work motor-car service, transportation of men by special cars, company freight haul and other numerous fixed charges determined by the auditor as entering into the cost of the project, as well as current salvage material prices, these are always available in the field engineers' bureau in a departmental circular, advising of such rates and the changes in them from time to time.

Before the field engineer signs an estimate for transmission to his superior, he consults the assistant engineer in charge of the reconstruction and construction track forces, as well as several supervisors, to secure their judgment as to whether the work can be performed at the estimated labor cost. He then notes on the lower left-hand corner of the estimate form that he has reviewed the estimate with the persons named.

On account of the large number of detail items required in track estimates and the limited time of the field engineers to comply with the emergency request to compile and submit their estimates, a schedule as shown in the accompanying table has been prepared. This is taken into the field and in the study of the project the engineers check off the items on the schedule to determine from observation, if such and such items should be included. Thus there is no chance for a "slip-up" or the omission of any item. This conserves the 10 per cent contingency item which is added to the estimate to include the unforeseen or overlooked items of cost.

What This Plan Accomplishes

In conclusion, there are several benefits derived from this system of estimating. First, in going so extensively into the details there is the least possible chance of omission of important items. This results in a conservative estimate that will not, as a rule, defeat the project. Then, it obviates the past practice of permitting these unforeseen items to be taken up in the contingency item. Second, the recent effectiveness of the Interstate Commerce Commission Revised Order No. 3, with respect to compilation of certain valuation reports by common carriers, necessitates that the estimate be prepared in minute form, as the work order when submitted must be compiled with great care as to details and with respect to units of material and labor costs covering new projects or physical changes in existing property. Third, it is gratifying to find that the final unit cost of the work, with very few exceptions, properly blends or corresponds with the terms and detailed units of the estimate.

Incidentally it may be said that when a municipality has condemned the company's right of way for street purposes, the estimating form is used in submitting the case to the court. It is typewritten and exhibited to show the estimated severance damages to the tracks of the cost to the company of any physical changes involved by opening the street. For this purpose the form permits the exhibiting of the data to the court and its engineers, with the details conveniently arranged and easily explainable.

Field Checking Schedule—Pacific Electric Railway

Right of Way:
- Width of present right of way.
- Additional right of way required.
- Fences, direction of property lines, etc.
- Adjacent buildings, structures, trees, etc.
- Curbs.

Track:
- Location as to right of way.
- Track centers or location as to trolley poles.
- Weight of rails.
- Joints.
- Bonding.
- Tie plates.
- Ballast.
- Culverts.
- Drainage.
- Condition of constructed tracks.
- New track centers, regard to clearances, overhead, etc.

Grading:
- Report on present roadbed, cut or fill and amount.
- Width of roadbed, berms, etc.
- Character of material.
- Material available.
- Possibility of wasting material.
- Drainage. Trees, etc.

Overhead:
- Present pole line.
- High tension.
- Foreign pole lines, high tension, telephone, etc.
- Possible location of new poles.
- Possibility of guying new poles when necessary.

Miscellaneous:
- Water and other pipe lines.
- Streets, paving, grades.
- Curbs, passenger landings.
- Road crossings, public or private, type required, culverts.
- Roadway signs to be moved or installed.
- Block signals.
- Franchises, etc.
- Possibility as to operation.
- Derail required.
- Any special conditions not covered by above.

The American Engineering Standards Committee has officially approved as "American standard" the code of lighting for factories, mills, and other working places, based upon earlier codes issued by the Illuminating Engineering Society and recently revised by a sectional committee under the sponsorship of this society. The code consists of rules covering the minimum requirement, from the point of view of safety, for illumination of traversed spaces during the time of use, methods for the avoidance of glare, and for exit and emergency lighting. Supplementary to the code are numerous suggestions relative to illumination values.

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Analysis of Public Accidents

Those from Street Cars Are Decreasing, While Those from Automobiles Are Increasing, Says the National Safety Council

ACCORDING to a report of the Committee on Public Accident Statistics, Public Safety Section, National Safety Council, there were approximately 75,500 fatal accidents in the continental United States during 1919, of which 55,500 were to males and 20,000 to females. The committee says that this estimate is made from the United States Census Bureau's statistics for the registration area, which comprises over 80 per cent of the population of the entire country. Following is a distribution of these accidents by more important causes.

FATALITIES IN THE CONTINENTAL UNITED STATES DURING 1919.

	Males		Females	
	Number	Rate per 100,000	Number	Rate per 100,000
Automobiles	7,372	13.77	2,453	4.77
Railroads	6,878	12.85	895	1.74
Falls	6,503	12.15	5,370	10 44
Drownings	6,302	11.78	916	1.78
Burns (exclusive of conflagrations)	3,314	6 19	4,588	8.92
Mines	2,686	5.02	1	..
Firearms	2,483	4.64	414	0.81
Machines	2,446	4.57	121	0.23
Deleterious gases	2,417	4.52	1,139	2.21
Miscellaneous vehicles	2,145	4.01	284	0.55
Street cars	1,875	3.50	487	0.95
Poisoning, other than above	1,359	2.54	821	1.60
All other causes	9,640	18.00	2,636	5.12
Total	55.420	103.54	20,125	39.12
Total, 1914	58,701	117.24	18,338	38.10

AUTOMOBILE AND OTHER TRAFFIC FATALITIES

Pre-eminent among the preventable causes of death stands the automobile. In 1915 there were 2,445,664 automobiles registered in the United States, which caused approximately 5,900 fatalities. In 1920, with 9,211,295 automobiles in use, the number of deaths mounted to about 10,640. These figures exclude the fatalities which occurred as the result of collisions of automobiles with heavier vehicles such as railway engines and street cars. Such fatalities represent about 7 per cent of all other automobile fatalities, so a complete estimate of the automobile deaths in the United States for the last year reaches the figure of 11,358.

These estimates for 1920 are made possible by statistics on automobile fatalities for sixty-two cities of the United States which are summarized in the following table. The assumption was made that the percentage of increase (1920 over 1919) shown for the sixty-two cities was approximately the same as the rest of the country.

AUTOMOBILE FATALITIES IN SIXTY-TWO CITIES OF THE U. S.
(Rates per million population)

Year	Population	Fatalities	
		Number	Rate
1915	23,317,162	1,831	78.5
1916	23,982,727	2,321	96.8
1917	24,508,032	3,044	124.2
1918	25,033,352	3,444	137.6
1919	25,560,244	3,561	139.3
1920	26,086,355	3,880	148.7

It is significant to note that while the automobile death rate has greatly increased during the last six years, the fatality rate from other types of vehicles has steadily declined. The table below shows the facts.

During this six-year period the automobile fatality rate in these thirty-five cities increased 89.0 per cent while street car fatalities showed a decrease of 15.3 per cent, railway fatalities a decrease of 25.1 per cent, and "other vehicles" a decrease of 52.0 per cent.

Letters to the Editors

Further Views on the California Resolution

SOUTH BEND, IND., Feb. 13, 1922.

To the Editors:

The California resolution on BUS TRANSPORTATION shows beyond a doubt the loyalty of its signers to the electric railway industry, but in the minds of many of us the effort is uncalled for or misdirected. I believe that sober second thought will convince the authors of their misapprehensions as to both the purpose and the effect of this publication.

The bus as a competitor of long established systems of transportation is no longer a myth, but is a solid, established and substantial reality. It will avail us nothing to ignore this fact, and it will avail us but little to attempt the obstruction of further development, within the limits of its possibilities. Even without further growth, the size of this new industry warrants and demands an organ of expression. *It will be served,* and is it not far better for us that it be served by an organ whose well established policy is co-operative instead of antagonistic? I believe the final judgment of the industry on this question will be "Yes." This effort against the ELECTRIC RAILWAY JOURNAL is futile unless we can stop similar publications. It is not the publication of BUS TRANSPORTATION that must be stopped; it is the publication of any organ of its kind. The futility of such attempts must be clear. To deny the ELECTRIC RAILWAY JOURNAL this expansion may retard the ELECTRIC RAILWAY JOURNAL, but will not avail this industry a single thing, nor hamper bus development in the least.

In a sense it is true, as the resolution says, that the electric railway industry has supported the ELECTRIC RAILWAY JOURNAL, but not a bit more than that the industry has supported manufacturers of steel rails, cars, equipment, etc. This support hasn't been charity in any of these cases. If the ELECTRIC RAILWAY JOURNAL had not been worth its cost, it is very certain that it would have received no support. It doesn't seem quite equitable to deny a business a new customer just because the old and the new are not now close friends. And it may be that by buying at the same counter they may become good friends, if not allies.

The California resolution is a well-meant protest, but I feel sure that reflection will convince these gentlemen that the resolution is uncalled for and futile and that the ELECTRIC RAILWAY JOURNAL is performing an additional service to the electric railway people by entering the bus field with the spirit and purpose that are behind BUS TRANSPORTATION.

FRANK H. WARREN,
Claim Agent Chicago, South Bend & Northern Indiana Railway.

HIGHWAY VEHICULAR FATALITIES IN THIRTY-FIVE CITIES OF THE UNITED STATES, 1915-1920
(Rates per million population)

Year	Population	Automobile		Street Car		Railway		Other Vehicles*		All Vehicles	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1915	15,860,800	1,274	80.3	559	35.2	860	54.2	403	25.4	3,096	195.2
1916	16,206,450	1,565	96.6	668	41.2	1,057	65.2	497	30.7	3,787	233.7
1917	16,551,899	2,057	124.3	785	47.4	1,078	65.1	388	23.4	4,308	260.3
1918	16,897,362	2,330	137.9	787	46.6	1,014	60.0	359	21.2	4,490	265.7
1919	17,244,398	2,468	143.1	576	33.4	723	41.9	265	15.4	4,032	233.8
1920	17,591,038	2,670	151.8	525	29.8	714	40.6	214	12.2	4,123	234.4

* Mostly horse-drawn, but including bicycles, motorcycles and airplanes.

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Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

Effective Method of Heat Treating Steel-Wheel Tires

The Sandberg Process Which Has Been Used for Treating the Surface of Rails to Obtain Increased Life Is Now Being Applied to the Treating of Steel-Wheel Tires

THE *Tramway and Railway World* for Jan. 19, 1922, gives some information regarding the treating of steel-wheel tires by the Sandberg process. This process has been used for a number of years for treating the surface of rails, but the application to the wheels of electric railways is new. As a result of experiments with this process it is now stated that tires can be produced for electric railway use with a higher tensile strength and higher yield point than has been possible previously.

Medium carbon steels in the ordinary untreated condition have, when examined under the microscope, a coarse granular structure consisting of pockets of pearlite surrounded by bands of ferrite or pure iron. The pearlite consists of alternate lamellæ of ferrite and carbide of iron.

New Method Gives Homogeneous Structure

The heat treatment of steel for the purpose of resisting wear has as its aim the breaking down of the coarse granular structure and the substituting of a homogeneous structure. This homogeneous structure is produced by the Sandberg process and the granular structure is entirely broken down, the pearlite having been converted into sorbite.

The changes in the structure of the steel obtained by the Sandberg process are accompanied by very decided increases in the tensile strength of the steel and in the hardness. A steel which in the normalized condition gave an ultimate breaking stress of 58 tons after treatment showed an ultimate breaking stress of 76 tons with a yield point of 58 tons, which is the same figure as the untreated ultimate strength. The elongation of 14 per cent and the behavior of the tire under the tup test show that an ample margin of safety is secured. The steel had a higher carbon content with a breaking stress after treatment of 81 tons, while the untreated tire had a breaking stress of 59 tons.

Still better results have been obtained on tires which have been ordered by one of the large tramways in England, when an ultimate breaking stress of 85 tons, with a yield point of 62 tons per square inch, was obtained with ample elongation and resistance to shock under the tup test. The Sandberg process is one which may be described as a process of slow quenching. Owing to the simplicity of the process remarkable uniformity in any batch of tires is obtained. The process consists of cooling the tire through the critical range of temperature by projecting against it, as it is slowly rotated, very large quantities of air into which atomized water is introduced. The tire is carried through the critical temperature in some three and one-half minutes, and no further heat treatment or reheating is required to complete the process.

Service Results Are Being Watched

Tires of this quality have not been offered to electric railways until lately, so that no actual results in service are yet available. In the early days of the process, however, a large number of the railway companies ordered trial lots, and the results obtained on these are most encouraging.

On one electric railway tires which in the untreated condition had an ultimate strength of 52 tons per square inch and in the treated condition an ultimate tensile strength of 66 tons per square inch have shown an increased mileage between shopping for wheel turning of 72 per cent, while on another electric railway the corresponding figure was 70 per cent. These tires had only an ultimate strength of 66 tons, and it is due to the improvements in the process since the time when the tires referred to went into service that much higher tensile strengths are now obtainable.

From the standpoint of maintenance costs, the increased life of tires is of the greatest importance to railway engineers, as, apart from the saving in material, considerable economies are effected in shop labor charges through the less frequent shopping of cars for wheel changing, while greater use of the car itself is obtained owing to its being out of service less frequently; in other words, the earning capacity of the capital asset is increased.

Sorbitic steel is both hard and tough without being brittle and is therefore well suited to withstand the severe shock and strains as well as the abrasion to which tires are subjected.

Next Month—Our

Annual Maintenance Issue

THE March 18 issue of ELECTRIC RAILWAY JOURNAL will contain a symposium on labor-saving methods and equipment, ingenious processes and material-handling devices. To make this comprehensive and useful your co-operation is needed. If you know of a particularly efficient method or machine which has proved effective for maintaining line, track or rolling stock tell us about it. A photograph or two will help put the idea across.

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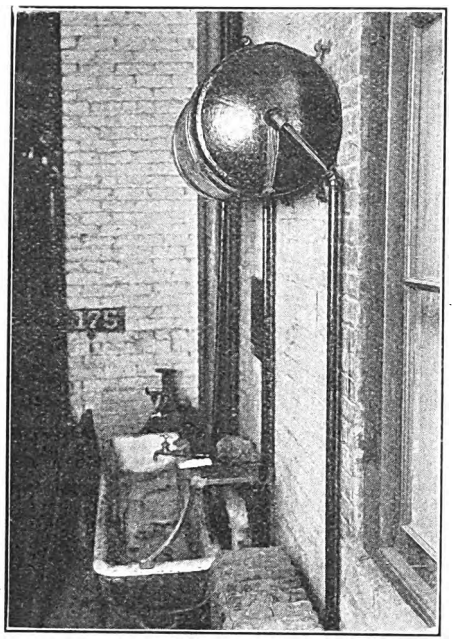
Providing Hot Water for Shop Employees

THE Second Avenue Railroad, New York, had a small washing sink at a location where connection for hot water was not convenient. This sink was located alongside a steam radiator used for heating purposes and Charles E. Chalmers, receiver for the railroad, conceived the idea of using the shop heating system to provide hot water for the shop employees while washing up. A discarded air reservoir from one of the cars was mounted on the wall over the sink by two iron straps and a connection was made from the cold water pipe to this reservoir. An additional pipe was tapped onto the system at the radiator and a ¾-in. pipe was run through the tank. This loop in the steam system has proved sufficient to provide hot water for washing purposes in this location. The air reservoir has a capacity of 30 gal. of water, which is sufficient for the number of employees who use this sink for washing, and the radiation from the hot water in the tank assists in heating the shop.



PROVIDING HOT WATER FOR WASHING

Catenary Curve Suspension Eliminates Pull-Off

BY GUY B. TREAT

Chief Engineer Oklahoma Railway, Oklahoma City, Okla.

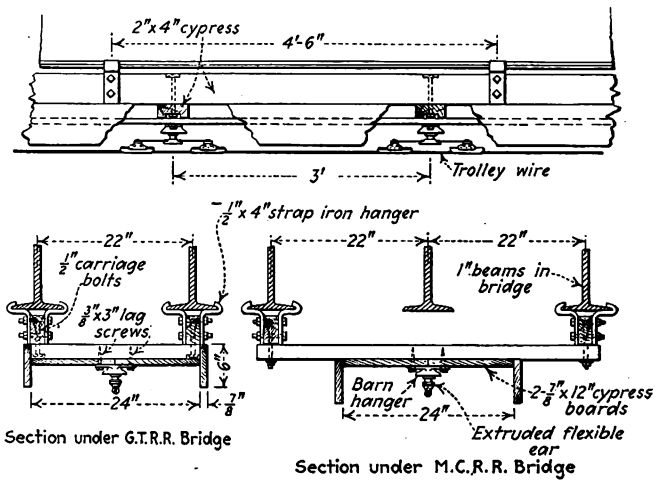
AN INTERESTING method of suspending catenaries on curves has just been tried out and installed on some of the interurban lines of the Oklahoma Railway, Oklahoma City. The accompanying photographs tell almost the complete story of what has been done. It will be noted that by the construction adopted the use of pull-offs has been eliminated altogether. Furthermore, the line has been freed of all sharp angles and the trolley of any kinks.

The principle of this suspension is to pull the messenger a little bit to one side and then put a kink in the hanger so as to keep the ear on top of the wire and give the wheel sufficient clearance. It was necessary to experiment a little in order to determine the correct length of hanger to use. This experimenting was accomplished by making some adjustable hangers as shown in one of the accompanying photographs, which consisted merely of a long rod put in the ear and fastened to an eyebolt by means of a two-bolt guy clamp, which permitted the necessary adjustment.

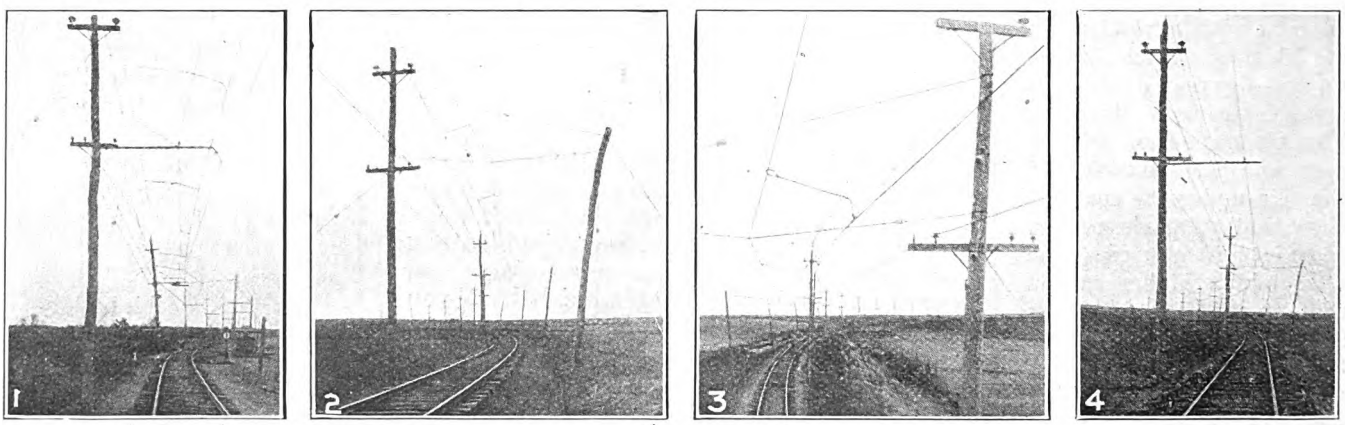
The details of this construction were worked out and performed under the direction of William H. Hahn, chief lineman for the company.

Trolley Trough Design Under Bridges

SOME typical sections of trolley troughs which have been installed under the Michigan Central Railroad and Grand Trunk Railroad bridges in Detroit by the Department of Street Railways are shown in the accompanying illustration. All lumber used is of clear cypress, brush treated with carbolineum. General Electric ⅝ in. boss, galvanized barn hangers and Ohio brass ⅝ in. boss, extruded metal flexible ears are used. It was necessary to use a total of twenty-eight hangers in the north-



TYPICAL SECTIONS OF TROLLEY TROUGHS INSTALLED IN DETROIT



CATENARY CURVE SUSPENSION ELIMINATES PULL-OFF

No. 1—Experimental hangers were used to determine correct lengths.
No. 2—Typical new catenary construction on curves.
No. 3—Another curve showing greater detail of hangers.
No. 4—How new catenary curve construction changes into ordinary tangent construction.

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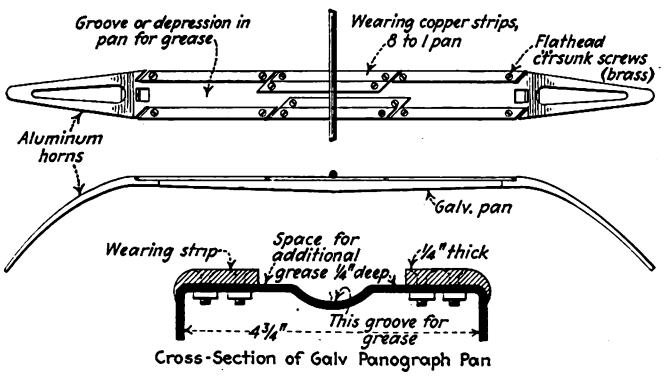
bound side and twenty-nine hangers in the southbound side for this construction. Crosspieces 2 in. x 4 in. in size are installed under the barn hangers, which are held in place by ⅝ in. x 3 in. galvanized lag screws. All bolts in the wood are countersunk and the heads are filled with pitch.

Lubricating Pantograph Shoes Increases Life

ACCOMPANYING illustrations show the slider trolley or pantograph shoe construction used by the London & Port Stanley Railway of London, Canada. In operation the contact surface of this G. E. S-159-A slider trolley is kept lubricated through the application of Keystone grease No. 820 by filling in the grooved portions of the galvanized pan and also between the copper contact strips. The galvanized pan is 4¾ in. wide and 36 in. long with a deep groove running the full length through its center line. This groove is filled with grease. The copper strips are ¼ in. thick and are attached along the edge to the flat side of the pan. There are two inner central copper wearing strips and the space between the outside strips where there are



CONSTRUCTION AND METHOD OF LUBRICATING PANTOGRAPH SHOE

no inner strips is also used for grease. Aluminum horns are attached to each end of the shoe.

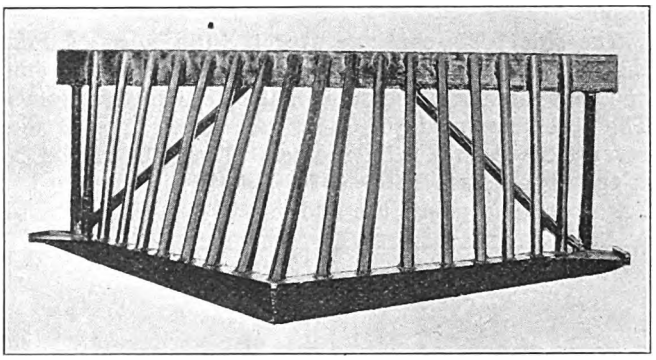
As a result of this method of lubrication a smooth wearing surface is obtained against the under side of the trolley wire and a considerably increased life is the result. The service obtained from the copper wearing strips is from 12,000 to 15,000 miles. A maximum tension of the shoe against the trolley wire of 14 lb. is maintained.

Fan Motors in Springdale Station Equipment Article

IN THE "Equipment and Maintenance" section of the ELECTRIC RAILWAY JOURNAL for Oct. 22, 1921, page 733, there appeared a description of the forced-draft fan equipment with push-button and pressure regulator control as installed at the Springdale station of the West Penn Power Company. This article stated that the installation was made by the Westinghouse Electric & Manufacturing Company. This is in error as the equipment installed was manufactured by the General Electric Company of Schenectady. Motors of the type described were developed by the General Electric Company approximately eight years ago, and installations have been made in various textile mills and mines in ventilating fan service since that time. The equipment described, however, is the first application of this type of motor with full automatic control as a power station auxiliary.

Pilot Made from Scrapped Trolley Poles

THE accompanying illustration shows a standard pilot used on the interurban cars of the Puget Sound Power & Light Company, Seattle, Wash., made entirely of scrapped trolley poles and obsolete iron.



PILOT MADE FROM OLD TROLLEY POLES

This construction gives not only additional strength and durability, but also resulted in a saving of more than 50 per cent as compared with old-style wooden pilots. For welding the various lengths of poles into position both electric and oxyacetylene processes were used.

Preventing Passengers from Interfering with Car Operator's View

THE safety cars of the Los Angeles (Cal.) Railway have been equipped with a bar extending from the door to the fare box stanchion, to prevent passengers, when the car is crowded, from standing against the right front window so as to block the operator's view. The bar is attached to the upright post at the door and fits into a clip on the fare box stanchion. The fastening at the door is hinged and when the operator changes ends the bar is removed from the stanchion clip and hangs from the hinged fastener. The bar thus takes up no additional room when not in use and is very effective in preventing passengers from obstructing the view of conditions on the right side. Its removal from the stanchion clip takes but a moment and danger from accidents in congested traffic sections is eliminated.

BAR FOR PREVENTING PASSENGERS FROM LEANING AGAINST RIGHT FRONT WINDOW

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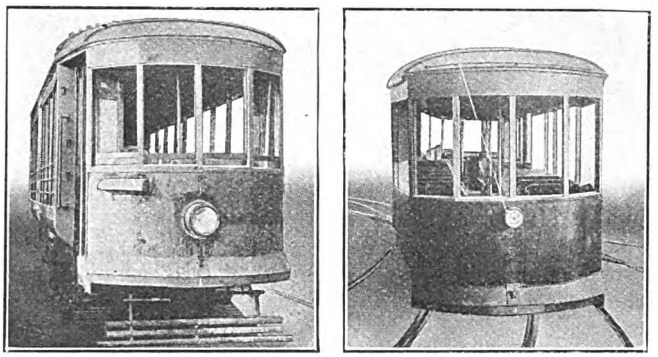
Welded Steel Cars in Cuba

THE accompanying illustrations show the first of some cars being built by the Camaguey (Cuba) Tramway Company, Ltd. No rivets are used in the entire steel work, as all the steel sheets and supports are electric welded. The first body which was constructed complete without running equipment cost about $2,500.

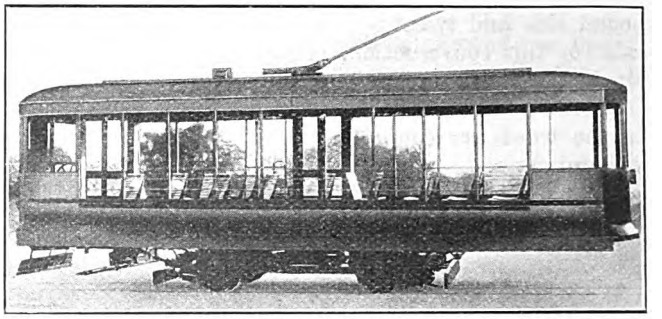
The side posts continue over the top so as to form the roof support. These are welded to the underframe, and they also form the outer half of the curtain guides. The side sheeting is of ⅛-in. gage steel, pressed to a reverse curve on a 9 in. radius. The width of the car at the underframe is but 6 ft., but this is increased to 7 ft. 6 in. at a point just underneath the seat cushions.



FRONT AND REAR VIEWS OF CAR BEFORE PAINTING

The cars are 30 ft. long and 10 ft. high over trolley boards. The distance from the floor to the roof is 7 ft. 6 in. The interior finish is of cherry and cherry slat seats are used. Other woodwork is natural Cuban cedar and mahogany. The flooring is ⅞ in. mahogany. Agasote roofing is used except on the canopies, which are cedar covered with canvas.

The cars are mounted on Brill 21-E trucks and have General Electric Company equipment consisting of type 258-D motors and K-63BR controllers. Other equipment used includes J. G. Brill Company's doors and seats, Ackley No-staff brakes, Pantasote curtains, Agasote roofing, H. B. life guard and Griffin cast iron wheels 30 in. in diameter.



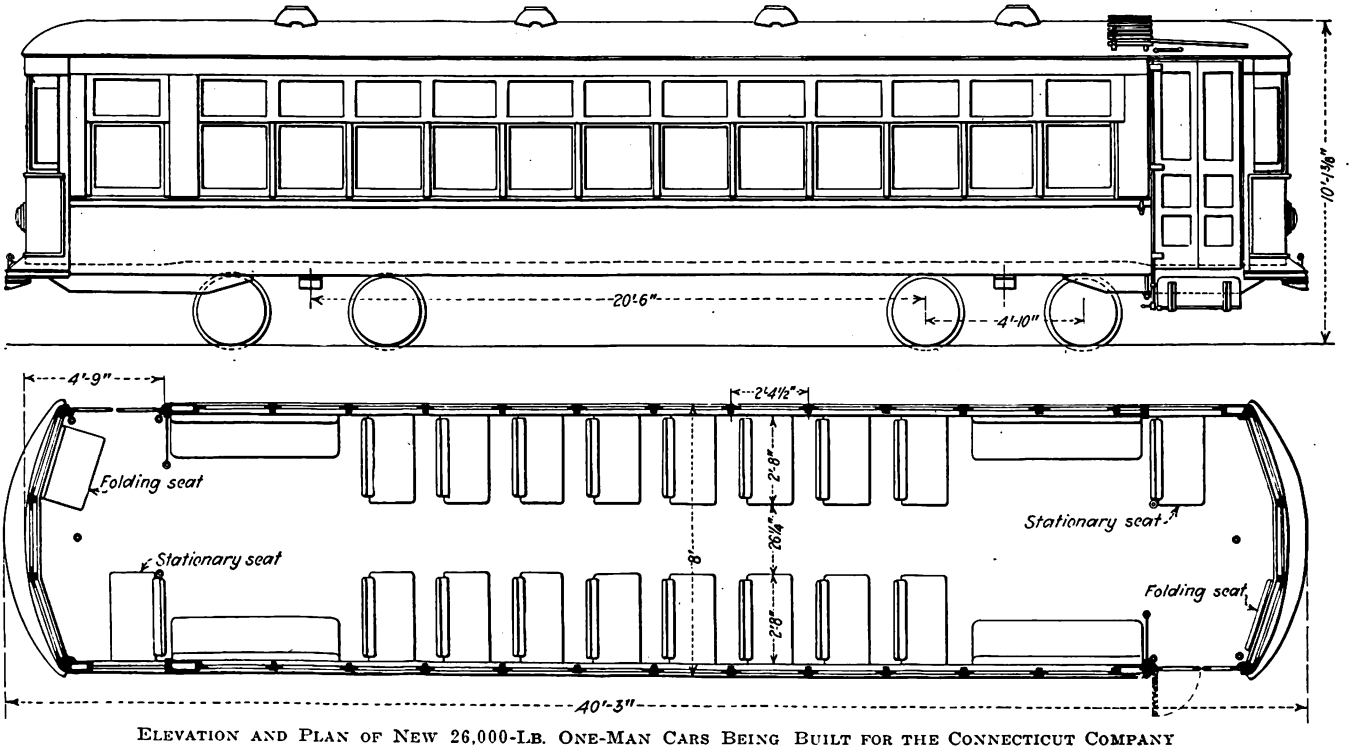
SIDE VIEW OF CAR AS COMPLETED BUT BEFORE PAINTING

The cars are operated on a pay-as-you-pass-the-conductor system, using Johnson fare boxes and International double fare registers, so as to give a double check on the fares collected. The cars are being built by the regular shop forces under the supervision of K. B. Crawford, superintendent of tramways.

Light-Weight Cars for Connecticut Company

Double-Truck, One-Man Cars Weighing 26,000 Lb. Will Be Equipped with Four 25-Hp. Motors and Full Safety Devices

THE Connecticut Company has a line operating between the towns of Torrington and Winsted, Conn., a distance of approximately 12 miles, which at present is served by four heavy double-truck cars. The line, which serves both residential and manufacturing districts, has been losing some traffic recently due to the competition from jitneys. This fact led to a consideration of one-man cars, but because at certain periods of the day quite large crowds are handled it was decided that the standard safety car would not be the best equipment to use.



ELEVATION AND PLAN OF NEW 26,000-LB. ONE-MAN CARS BEING BUILT FOR THE CONNECTICUT COMPANY

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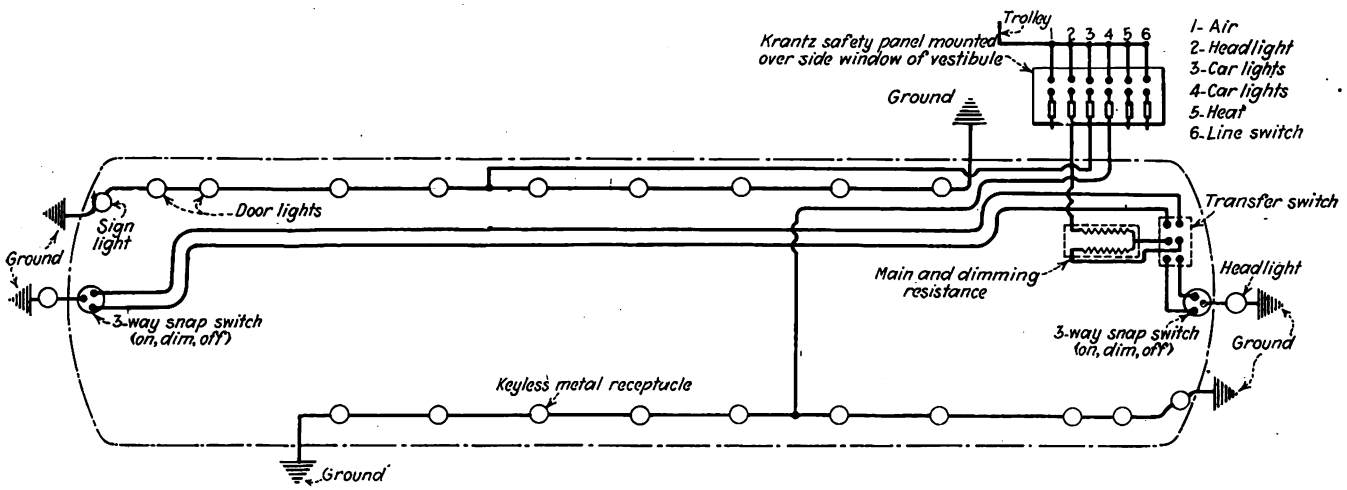


WIRING DIAGRAM FOR NEW CONNECTICUT COMPANY CARS SHOWING LOCATION OF LINE SWITCH AND SAFETY PANEL

For this service a new car has been designed which in general appearance is an elongated safety car. The over-all length is 40 ft. 3 in. and the distance between corner posts is 29 ft. 6 in. This car, which will be operated by one man, is designed to seat fifty-two persons and is equipped with four Westinghouse 506-A-2 motors with Brill trucks. An elevation and a plan drawing of these cars are shown in in the accompanying illustrations.

Three of these cars are being built by the Wason Manufacturing Company and will be placed in operation in March or April to replace the four heavy cars now in service. They will weigh approximately 26,000 lb. each, and a great deal of the piping and fitting will be aluminum. The cars are being equipped with all features of the standard safety car and in addition will each be equipped with a pneumatically operated line switch beneath the car. All circuits such as lighting, heating, headlight, etc., will be controlled by a Krantz safety panel. A wiring diagram is shown.

At the time these new cars are placed in service the present power house, which is an isolated plant using reciprocating engines, will be abandoned. In its place two 200-kw. Westinghouse motor-generator sets are being installed and power will be purchased from the local power company.

It is confidently expected that these changes will place this line on a paying basis.

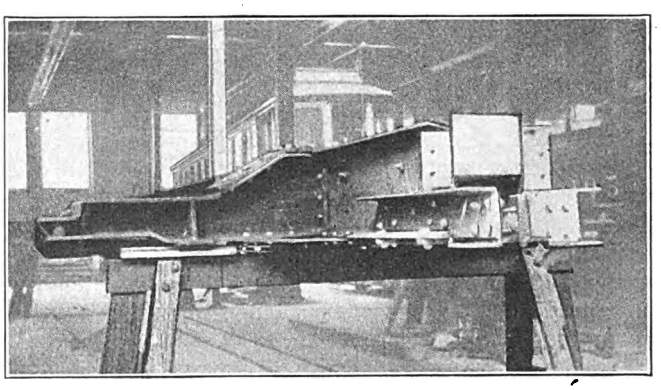
Equipment Maintenance Costs Compared

THE accompanying table gives a comparison of equipment maintenance cost and car mileage data for the Texas Electric Railway during the years 1914 to 1920 inclusive. This furnishes a good example of the upward trend of maintenance costs and at the same time is an example of very low costs in connection with equipment maintenance.

The figures in the accompanying table were taken from the auditor's statements and were supplied by Walter Silvus, superintendent of equipment for the Texas Electric Railway, Dallas, Tex.

Split Forged Steel Car Bolster Stronger and Lighter than Cast Type

THE accompanying illustration shows a forged steel split bolster which was made in the shops of the Portland Railway, Light & Power Company for freight car service. The bolster is made with a 1-in. web and §-in. x 10-in. flange. The flange is electric-welded to the web and is reinforced at the side bearing with a §-in. plate.



SPLIT TYPE CAR BOLSTER

This type of construction provides a stronger and lighter bolster than the cast steel type and results in a saving of $65 per car.

COMPARISON OF EQUIPMENT EXPENSE AND CAR MILEAGE DATA, YEARS 1914 TO 1920 INCLUSIVE

Year	Total Amount Accounts 29 to 40	Total Amount Account 66	Number City Cars	Number Interurban Cars	Number Miscellaneous Cars	Miles of Track	Total Car-Miles	Cost per Car-Mile Total 29 to 40	Cost per Car-Mile Account 66
1914	$89,739.39	$35,129.64	61	59	46	266.94	5,731,667	0.015	0.0061
1915	55,125.96	28,632.20	64	64	37	266.94	5,239,429	0.0105	0.0054
1916	55,184.88	28,812.54	60	63	38	266.94	5,214,920	0.0105	0.0054
1917	70,561.05	29,414.69	57	79	38	279.38	5,576,207	0.0126	0.0052
1918	89,766.42	38,664.52	58	82	38	279.39	5,778,946	0.0155	0.0066
1919	121,403.33	46,667.27	66	82	40	280.66	5,930,479	0.0204	0.0078
1920	149,489.20	56,115.52	72	84	40	280.14	6,108,394	0.0244	0.0091

Years 1914, 1915 and 1916 operated as Texas Traction Company and Southern Traction Company and above figures are a consolidation of the two companies.

Explanation: Account 29 —Superintendence of equipment,
Account 31 —Substation expense,
Account 32 —Repairs to passenger and combination cars,
Account 33 —Repairs to freight and express cars,
Account 35 —Repairs to service cars,
Account 36A—Repairs to electrical equipment of passenger and combination cars,
Account 36B—Repairs to electrical equipment of freight and express cars,
Account 38 —Repairs to shop machinery,
Account 39 —Shop expenses,
Account 40 —Horses and vehicles,
Account 66 —Carhouse employees.

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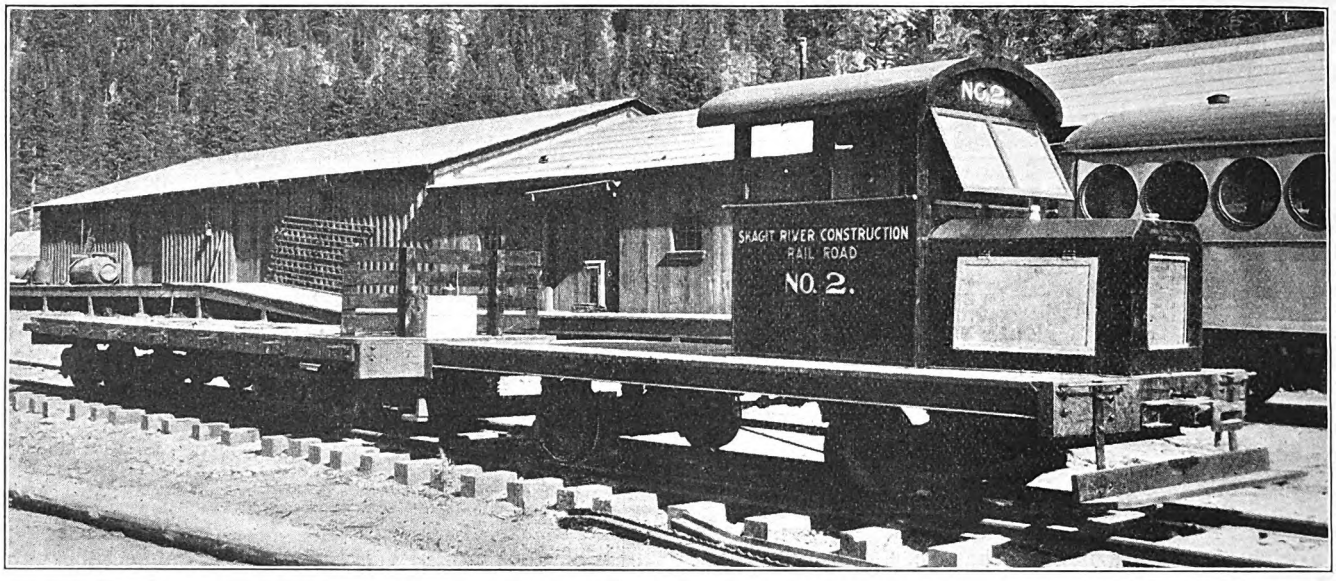


GASOLINE LOCOMOTIVE WITH FOUR-CYLINDER ENGINE. THE CAB ACCOMMODATES THE OPERATORS AND SEVERAL PASSENGERS. NOTICE THE FOOTBOARD AT EACH END

Gasoline Rail Equipment Developed for Seattle Power Project

Special Locomotives and Converted Motor Trucks Are Used in the Construction Work for the Skagit River Power Plants—Details of This Equipment Are Given

THE use of gasoline instead of steam locomotives is saving the city of Seattle from $50 to $75 a day. This on the 23-mile line from the terminal of the Great Northern Railroad at Rockport to a power site at Newhalem, the latter being about 100 miles northeast of Seattle. The maximum grade on the line is 1 per cent.

The freight equipment, shown in the accompanying photographs, consists of two gasoline locomotives, built by the Skagit Steel & Iron Works, Sedro Woolley, Wash. Rebuilt motor trucks are used to carry passengers.

The No. 2 locomotive, which is 18 x 7 ft. over all, has sufficient power to haul one standard box car loaded to full capacity of 80,000 lb. It travels 20 m.p.h. in high gear at normal engine speed. The framework of this locomotive is of steel with a wooden decking extending the entire length. A foot-board and spring drawhead are provided on both front and rear.

The locomotive is propelled by a four-cylinder, heavy-duty truck engine inclosed under a hood at the extreme front. Immediately back of the hood is a cab inclosing the control mechanism and large enough to accommodate the operator and several passengers.

The drive is through an inclosed multiple disk clutch and a four-speed selective-type transmission mounted on the frame.

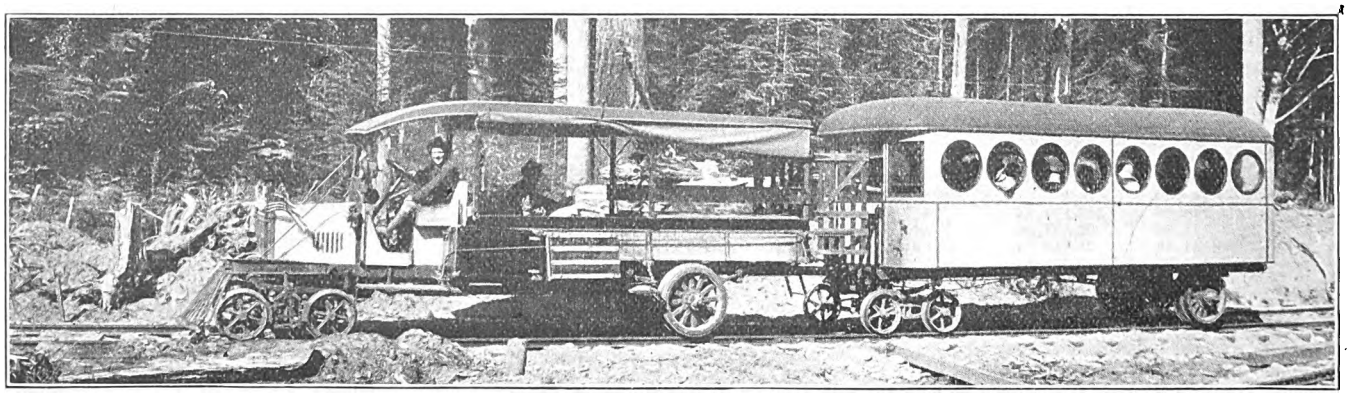
From the transmission a tubular propeller shaft with universal-joints on each end extends to the reverse-gear box on the rear axle. Here the power can be transmitted for either forward or backward travel. The final drive is through a pinion shaft connected by bevel gears to both front and rear axles. The pinion shaft has two universal slip joints at its end to provide for free movement of the axles without straining the shaft.

The front and rear axles, which are identical, are of the semi-floating automobile truck type. Hyatt roller bearings are mounted at the wheels, and Timken bearings at the bevel-drive gears. All moving parts on the axles are entirely inclosed and run in oil. This arrangement gives four speeds forward and four speeds backward, so that the locomotive can be run backward and forward at equal speeds.

Brakes with cast-iron shoes are mounted on each of the four wheels, being operated by a wheel in the cab. The semi-elliptic springs are large enough to take up the driving torque of the axles.

STANDARD AIR BRAKES ON HEAVIER EQUIPMENT

When heavier equipment was required for the construction work, the No. 3 locomotive was purchased. This will haul four loaded cars. It carries freight in a space extending full width and two-thirds of the



MOTOR TRUCKS CONVERTED TO RAIL SERVICE. THIS OUTFIT MAKES 25 M.P.H. IN CARRYING PASSENGERS ON THE CITY OF SEATTLE CONSTRUCTION RAILROAD

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length. At normal engine speed the No. 3 unit makes 18 m.p.h. in high, and 2 m.p.h. in low gear.

The frame of the No. 3 locomotive, which is steel beams and channels, is 40 x 9 ft. over all.

Power is furnished by a 90-hp. six-cylinder gasoline engine. The equipment includes an electric starter and generator, the latter providing current for electric lights.

The selective-type transmission has three speeds forward and reverse in direct drive, and a back gear which provides three low speeds for starting. The final drive is by worm gears to the extreme front and rear axles, the power being transmitted to the other axles by high-speed roller chains. All eight wheels on the two four-wheel trucks, therefore, are drivers, thus giving maximum traction.

The axles are mounted on ball bearings running in oil-tight housings. Worm gears and all transmission gears also run in oil.

The No. 3 locomotive is fitted with Westinghouse standard air-brake equipment, used for braking the locomotive itself or the cars that are hauled. Air-operated sanders are provided in both front and rear.

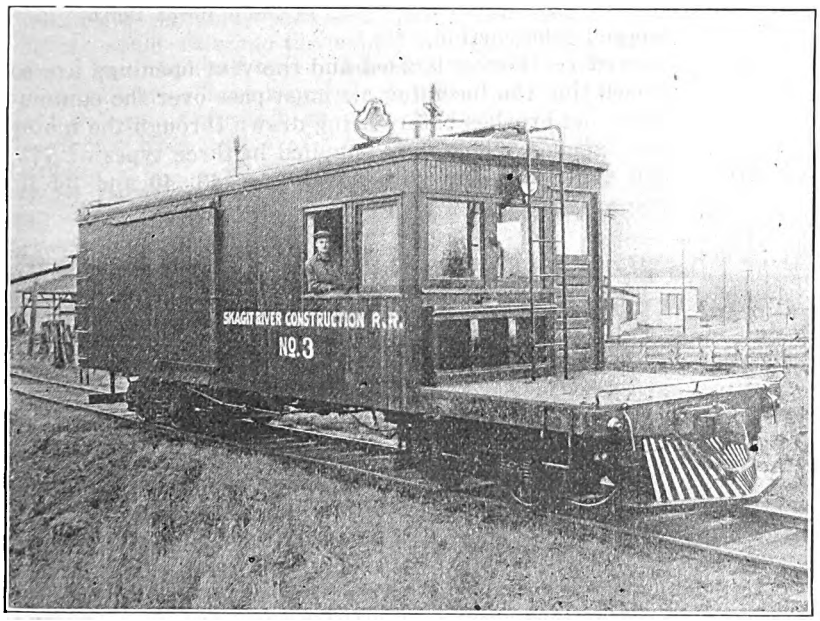
The passenger equipment consists of two rebuilt motor trucks. The power unit is a 2½-ton Signal truck, on which steel tires have been placed on the rear wheels and a pony truck on the front end. The standard foot-brake on the rear wheels has been retained, and what was formerly the steering wheel is now used to operate brakes on the pony truck. An additional gear has been placed on the transmission shaft, so that the same speed can be secured backward and forward. These converted trucks can run at 25 m.p.h., but usually take one and one-half hours for the 23 miles from Rockford to Newhalem on account of stops along the line.

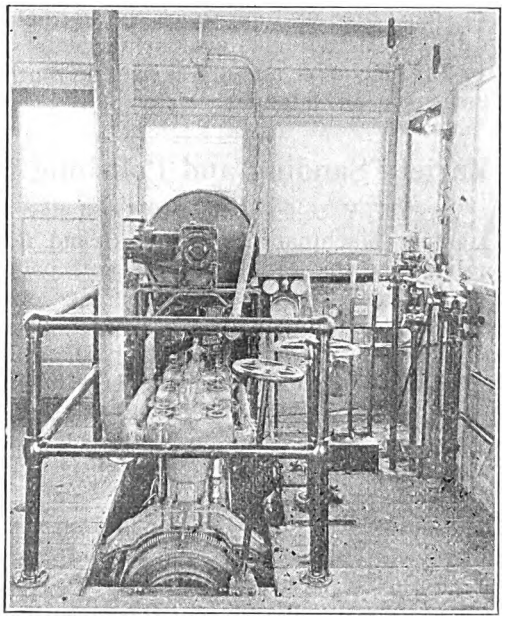
The trailer unit is a Federal truck which during the war was in bus service between Seattle and Camp Lewis. The engine has been removed and the body set forward in a central position on the truck. While the differential is left in position it is not used, as power is not supplied to the rear axle.

What's New from the Manufacturers

New Steel Developed for Drills

A STEEL of moderate cost and between carbon and high-speed steel in cutting ability has been produced recently by the Cleveland Twist Drill Company, Cleveland, Ohio, and is called Mezzo steel. This new steel is said to possess unusual qualities as the result of introducing a certain combination of alloys and giving a special heat treatment. It is well understood that a large number of shops are not equipped with sufficiently modern, powerful machines to get maximum results from high-speed drills. They are forced to reduce the speed of the drills, and if rigidity is lacking, also reduce the feed, resulting in much less work per hour. For maximum efficiency and strength, high-speed drills must be run fast enough to keep them fairly hot, and if the equipment will not allow this, a reduced speed nearly always results in breakage, which is costly. Costly breakage forces many shops with improper equipment to go back to carbon-steel tools.





LEFT, GASOLINE LOCOMOTIVE WITH FREIGHT COMPARTMENT AT REAR FOR WORK NOT SUFFICIENT TO JUSTIFY USE OF HEAVY STEAM LOCOMOTIVES. FRONT PLATFORM LEFT OPEN FOR USE IN ODD JOBS. BELL AND WHISTLE ARE MOUNTED OF ROOF. RIGHT, SIX-CYLINDER ENGINE INSTALLED IN OPERATOR'S COMPARTMENT FOR No. 3 SKAGIT RIVER GASOLINE LOCOMOTIVE. DRIVING AND BRAKING MECHANISM ARE BROUGHT TOGETHER HERE

TABLE OF COMPARATIVE DRILL TESTS

Size Drill	Material	R.P.M.	Feed per Revolution	Peripheral Speed, Ft. per Min.	Inches Drilled	
					Mezzo	Carbon
¼	3 in. C. I.	356	0.031 in.	60	60*	5
¼	4 in. M.S.	356	0.024 in.	60	32*	¼
¼	4 in. M.S.	294	0.024 in.	58	10½	¼
¼	4 in. M.S.	225	0.020 in.	50	32½	½
¼	3 in. C.I.	294	0.020 in.	58	30*	1
15/16	4 in. M.S.	225	0.024 in.	55	8	½
15/16	3 in. C.I.	294	0.032 in.	75	30*	2½
1	4 in. M.S.	225	0.015 in.	60	21	1½
1	3 in. C.I.	225	0.020 in.	60	25	1
1¼	4 in. M.S.	180	0.016 in.	59	24	4
1¼	4 in. M.S.	144	0.020 in.	51	12	1½
1¼	4 in. M.S.	144	0.032 in.	61	30*	2½
2	4 in. M.S.	106	0.015 in.	55	32*	3½

Note—3 in. C.I. means a cast iron billet 3 in. thick. 4 in. M.S. means a machinery steel billet 4 in. thick. *Means test stopped, drill still in good condition.

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It is evident that a great saving in expense can be made and maximum production obtained in the above cases by the use of a drill which sells at a moderate price and which will stand up under speeds and feeds considerably above those possible with carbon drills. Mezzo drills are recommended for drilling cast iron at greater speeds and feeds than can be used for carbon drills. In drilling machine steels and the softer alloy steels, Mezzo drills are said to be excellent, performing at much higher rates of speed and feed than those made of carbon steel. They are not, however, recommended for use on extremely hard materials. For this purpose high-speed drills still outclass anything developed and their comparatively high initial cost is more than offset by the greater production.

The accompanying table of data from Mezzo drill tests is said to represent good general practice and should be compared with an average peripheral speed for carbon drills of about 35 ft. per minute in cast iron or machinery steel, with 0.010 in. feed per revolution. It will be seen that the new drills produced holes at more than three or four times the normal rate of carbon drills. Mezzo drills are furnished in sizes from $\frac{2}{16}$ in. to 2 in. inclusive and are carried in stock for prompt deliveries in any standard size.

Variety Sanding and Polishing Machine

A VARIETY belt sander has been developed by the Oliver Machinery Company, Grand Rapids, Mich., designed for the rapid sanding and polishing of all kinds of small irregular shapes, edge work and flat surfaces; also for polishing metal surfaces. It can be used in wood-working and pattern shops, or wherever a finishing and polishing machine is required. Features which are claimed for the machine include rapid production, ease of setting up work and maximum convenience and safety to the operator in performing his duties.

The main drive pulley is mounted on a countershaft, located on a substantial base, with a frame swinging about the center line of the countershaft and carrying a support arm. On this support arm are carried two clamp brackets, one of which supports the main idler pulley and the tension idler, the other supports the table and backing plate or any forms or flexible pans desired.

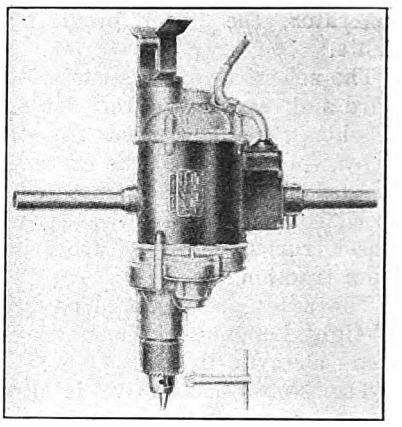
The machine will take belts up to 10 in. wide and 14 ft. long. The 10-in. x 12-in. edging table tilts to any angle up or down to 30 deg., can be adjusted in or out, and has drilled holes for attaching wood tops or forms. The backing plate is 10 in. wide and can be adjusted in and out to suitable tension on the belt; it has drilled holes for attaching flexible pads.

The main idler runs in ball bearings and is adjustable up or down the whole length of the idler arm to take care of various lengths of belts. The tension idler is of the ball-bearing type, fulcrums in the center line of the main idler and is balanced by weights to give the right tension to the belt. Both the main and tension idler pulleys are faced with leather.

The fork idler of this attachment, mounted on the machine in place of the regular table, is used for doing oval sanding, such as oval frames and all irregular shapes. The fork idler, rigid in construction, carries two aluminum idlers which run in ball bearings and are adjustable to the work. The height of the machine is 80 in. over all, and about 4 x 8 ft. of floor space is required. A 2-hp. motor, running at about 900 r.p.m., is required when directly connected to the lower drive pulley.

New Type Electric Drill

THE Hisey - Wolf Machine Company, Cincinnati, Ohio, is marketing a new type of motor drill for operation on either direct or alternating - current circuits. Some special features include ball bearings on all revolving spindles and special design of the detailed parts of the motor in order to give a rugged construction.

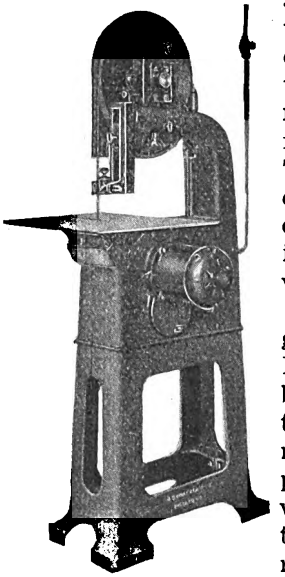


ELECTRIC MOTOR DRILL

Forced ventilation is used and the vent openings are so placed that the incoming air must pass over the commutator and brushes before being drawn through the motor and expelled. These are supplied in three types of 775, 800 and 840 r.p.m. with weights of 43, 40 and 34 lb. respectively.

Electrically Driven Band Saw

THE accompanying illustration shows a new 16-in. band saw which is being introduced by J. D. Wallace & Company, Chicago, Ill. This new machine has disk steel wheels, which insure durability and accuracy, and ball bearings are also provided throughout. A totally inclosed electric motor is built into the machine and directly connected to the lower wheel by a fabroil gear and steel pinion. These run in oil to insure lubrication and quiet running. The centrifugal force throws the oil into the bearings and keeps them well lubricated.



ELECTRICALLY OPERATED 16-IN. BAND SAW

The table is a flattened and ground steel plate 19 in. by 21 in. It is mounted on a large rocker bearing, which can be adjusted to any angle from 45 deg. to minus 5 deg. An indicator is provided to show the angle at which the table is tilted. The table is mounted so that it can be readily removed. All adjustments are controlled by hand wheels or thumb screws. The height of this machine is 5 ft. 9 in. over all; the table is 42 in. from the floor and the floor space required is 15 x 29 in. A ½-hp. General Electric motor is used which has a speed of 1,750 revolutions per minute. The saw runs 3,150 ft. per minute.

The blades used are especially made for this machine. They are of special steel properly treated and cut so as to give the greatest number of producing hours on this size wheel.

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How Can the New York Transit Problem Be Solved?*

Transit Facilities in New York City Have Lagged Behind Its Needs—Only the Municipality Can Afford to Extend Transportation to Any Extent Into Undeveloped Territory—Operation Should Be Under Private Direction—Universal Transfer Privileges Are Desirable

BY DANIEL L. TURNER
Consulting Engineer to the Transit Commission of New York City

IN THE early part of the nineteenth century, foot and horse locomotion was the only means at hand. The distance that the people would live away from the business center was a matter of the time they were willing to spend in travel to their occupations in the morning and to their homes at night. In the past, this time limit has appeared to be about one hour in and one hour out. This meant 3 or 4 miles out for the foot travelers, and 6 or 8 miles for the horse travelers. The workers would walk and the employers would ride. Such old towns, therefore, would contain as large a population as could be cared for within an area circumscribed by a radius of from 6 to 8 miles.

With the coming of the steam railroad, the population of the towns soon increased and congestion was felt within the 3 to 4-mile limit. Then cheap horse transit became necessary. The bus first, and then the horse-car were evolved. The New York & Harlem Railroad, a horse car line operated in Fourth Avenue in New York City in 1832, was the first street railway in the world. The buses and horse cars brought the then existing suburbs within the one-hour ride. London now took the lead and the first urban rapid transit line in the world, an underground railroad, was built in London in 1863. New York in 1868 operated the first elevated railroad, built along Greenwich Street from the Battery to Dey Street. In San Francisco, in 1873, the first cable surface road was placed in service. Then, a few years later, near Berlin in 1881, the first electric operation came.

The electric roads quickly superseded all other forms of surface travel and extended the city transit limit from 10 to 12 miles from the business center. In 1904 the first rapid transit express line was placed in operation in New York.

Fifty years ago our transit problem was just the same as it is now. It only differed in intensity. Then the population in the area now included within the city was about 1,500,000. Now it is nearly 6,000,000—four times as great. At that time the total fare passengers only amounted to about 150,000,000. The fare passengers have now increased to nearly 3,500,000,000. That is to say, the passenger traffic has multiplied nearly seventeen times. But before each added transit line has been ready for use the traffic growth has more than ancitipated it. When conditions have become unendurable, some effort has been made to meet the situation. But each time, with few exceptions (a notable exception was the dual contracts) the aim seems to have been to secure immediate relief rather than lasting benefit, and then to shift the problem on to those who were to come afterward.

Our cities are planned today very nearly as 100 years ago. The old man-and-horse towns of a century ago needed for circulating purposes only roadways along which men and horses could travel, and these roadways criss-crossed the town in all directions. When street railway transit superseded foot transit, the street railway system rather than the street system should have been accepted as the principal circulating medium of the town, and the town should have been planned and constructed accordingly. But this was never done and is not being done even now. The town planner in the old days failed to recognize this principle—and even today, in our time, those responsible for the planning and development of our cities have not grasped the full significance of this principle and its importance with respect to comfort, health, happiness and economic welfare of the community.

HOW PRIVATE OWNERSHIP DELAYED DEVELOPMENT

Private ownership and operation of city transit facilities because of the principles underlying it has retarded the proper development of our modern cities. To understand the reason for this, let us begin at the beginning once more. When the 3 or 4-mile town limit was passed, the essential thing was not done. The town authorities left the construction of the street car system to private interests. The natural course for a business man is to develop his property so as to produce as quick a return as possible, and these old horse car owners selected the route which seemed to them to offer the best prospect of early revenue on the investment. Of course, as many residents as could moved their residences so as to be near the route. They were attracted, just as a magnet attracts. What was the result? Congestion of course! Rush-hour congestion! then housing congestion!

What happened next?

Other lines were constructed, of course. Did their owners seek another part of the city for a route and endeavor to develop more of the city? Why should they? Why take the time to develop new territory when good business was immediately in sight? The next line was located as near the first one as practicable. And so history repeated itself from those old days until now. Meanwhile, there was plenty of vacant space available for development and plenty of population to fill it comfortably. But instead of spreading out, the population started to spread up. Instead of living and working in one plane, we are now doing so in forty planes, and the limit is not yet.

Transit facilities should be based on the area of the city served—not on the traffic immediately in sight. Only by utilizing this principle as the guiding policy of future transit development can the existing transit conditions be cured.

Expanding the transit system in this manner, of course, does not mean that there should be street railway lines in every street. But it does mean that a new lattice-like transit system should be superimposed upon all of the old and new street systems on an enlarged scale. Instead of through every street, the railway tracks should be located a number of streets apart in each direction, depending upon the character of the transit being considered.

If the area basis of developing city transit had been followed from the beginning, many of the most objectionable features of city life would not exist today. Everybody would be more comfortable, healthier and happier. Our people would not be living so much in layers. Instead, most people would be in their own homes spread out through the open country, thus making living conditions more ideal. The rush-hour congestion—our greatest transit problem—would not exist as we now experience it. There would be heavy movements of traffic in all directions to and from the business center, but they would not be concentrated movements along a few lines of travel. Therefore, the rush hours, as we now know them, would not exist at all. The commission proposes to expand the application of this principle to include surface facilities as well as rapid transit lines. Of course this means municipal ownership with proper planning.

The great trunk rapid transit lines

*Abstract of paper read before the New York section of the American Society of Civil Engineers on Feb. 15, 1922.

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are the chief arteries of travel. The surface lines first, then the buses, then the streets, in the order of their relative importance, are only the lesser arteries of the system. All of these traffic agencies must be utilized, and to be utilized most effectively they must be regulated and controlled by the community, just as the streets are now regulated and controlled by the community.

In preparing for the extension of a city, the streets are laid out, graded, sewered, water supplied, and paved beforehand in order to induce the population to follow. It is even more important that we should not wait for the population to accumulate before constructing the necessary transit lines. Yet, this is the policy the operating companies would have us adopt in the case of transit lines when they own and control them. They are averse to developing new territory. The traffic returns from such territory would be too lean. They are after the fat only. They contend that municipal transportation should not be furnished to a community until there is a population ready to be served. They insist that it is better to follow old lines of travel than to create new ones. They would parallel already congested lines by new facilities, instead of deflecting the new facilities into undeveloped territory.

From the viewpoint of the operating companies, and considered as a business proposition, the correctness of all of these principles cannot be disputed. Such principles have served as the guiding policy in the past, and have produced the conditions which now prevail. If the same principles are to control in the future, then strap-hanger service will be the public's portion for all time. The rapid transit line, therefore, at the outset would have a larger traffic return. There would be fewer lean years to wait for the territory to develop.

In journeying from home to work, one must utilize at least two, and frequently three means of travel. First, of course, he must use the street. He may then use a rapid transit line or surface line or bus to his destination, or he may use a combination of two or more. Of course he pays no fare for the use of the street. He ought to pay only one fare for the service on such part of the transit system that he is required to use, whether bus, surface line, or rapid transit line, separately or in combination. This end can only be attained under a system of universal transfer, and under a system which utilizes all of the facilities coordinated under a general plan. A single operating company can best perform this service. Therefore, monopoly of operation is desirable.

As between municipal operation and private operation, there can only be one answer, as I can see it. The public cannot perform any function as cheaply as a private company can do so. Public employees cannot be held under the same strict discipline that can be exercised over private employees. Under present political conditions, it would be impossible to keep municipal operation free from political dictation and domination. At the present state of civic development, municipal operation to me is unthinkable. The only alternative is private operation under public control, a control aimed to secure a convenient, adequate, and safe service for all. In so far as supplying the facilities is concerned, municipal ownership would insure their construction and extension in the manner which would best serve the community.

The different boroughs of the city are not all equally desirable climatically, physically, or socially; so that everything else being equal, they cannot be expected to develop exactly alike. But the city's transit facilities should furnish the same standard of service to them all. At least there should be no discrimination in this respect. Every borough should be permitted and assured the full measure of development which its own particular circumstances make possible.

In developing a plan of municipal ownership and private operation, at first several operators of the transit lines may be necessary, but ultimately a single company should exercise all of the operating functions. An operating monopoly by a private company under public control will insure the same character of service to the whole city at a uniform rate of fare, will make possible universal transfers, will provide every citizen with transportation from his home to his work for the same fare, will enable the passenger to traverse the city from the circumference to the center for one fare, and will reduce operating costs to the minimum and therefore will permit the least fare.

Increases in New York Traffic and Need for New Lines

The traffic on the surface and rapid transit lines of New York City has nearly doubled in the past fifteen years. In 1906, the revenue passenger traffic on all lines was 1,251,000,000. In 1921, it had increased to nearly 2½ billion passengers, or had nearly doubled. In 1870, fifty years ago, there were 103 revenue passenger rides per capita per year. In 1921, there were 437. In fifty years the riding per capita has increased four and a quarter times.

Considering rapid transit traffic alone, in 1913, the year the dual contracts were signed, the rapid transit lines in Manhattan, Brooklyn and the Bronx, subway and elevated lines together, exclusive of the Hudson & Manhattan, carried 810,000,000 fare passengers. In 1921, these same rapid transit lines, together with the new lines which had been placed in operation, carried about 1,418,000,000 passengers during the year. This means that the increase in rapid transit traffic alone has been 75 per cent in nine years. The foregoing figures are sufficient to indicate the enormity of the increase for which municipal transportation must be provided if the development and the prosperity of the city are not to be held back.

A continuous subway building program is necessary if the city is to catch up with and keep up with its tremendous transit needs. The city has been building subways for twenty-one years, but intermittently. Up to the present time, the Interborough company, the first operating company to begin to operate city-owned subways, has expended $178,000,000 for construction and equipment. The Brooklyn company, which came into the plan later, has expended $78,000,000 for the same purposes. The city alone has spent for construction $295,000,000. This makes a total expenditure during the past twenty-one years of $551,000,000. Before the dual system is finished, approximately another $50,000,000 will have to be spent by the city and companies, so that before the dual system is finished, the city and the companies must spend over $600,000,000. This vast sum would almost construct and equip three two-track steam railroads across the continent from the Atlantic to the Pacific.

The dual system contracts were nine years too late in getting started. The war has delayed their completion, so that now the construction program is fully ten years behind the transit requirements. The time has now arrived when we must look ahead again. A comprehensive plan for the enlargement of the rapid transit system must be developed. The work of carrying out such a plan must be begun immediately and proceeded with gradually and continuously if the transit facilities are in any degree to keep pace with the tremendous traffic increase.

The money for such a program may be obtained just as it has been obtained in the past—that is, by utilizing the credit of the city and borrowing such amounts as may be necessary, not to exceed the city's debt limit. The only difference between what has occurred in the past and what is proposed for the future is that the city's credit should be utilized not only to secure rapid transit facilities, but also to secure bus and surface car facilities, whenever the transit program requires it.

The debt limit of the city is fixed by law at not greater than 10 per cent of the total assessed value of the real property in the city. All of the money that the city has expended on its subway facilities to date, aggregating nearly $300,000,000, has been obtained in this way. There is now charged against the debt limit the $233,000,000 expended for new subways under the dual contracts. The commission plan provides that the interest and amortization on this sum will be paid out of the pooled receipts of the new system, thus removing the charge against the debt limit, and thus making this vast sum available for new subways.

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In the future, some other means of enabling the city to supply the necessary funds may be necessary, but whatever plan may be adopted, the cost of municipal transit must be paid for, and the answer is that the city must find the necessary money.

In 1920, during the maximum three hours in one direction, from 7 to 10 a.m. workward, or from 4 to 7 p.m. homeward, the total commuter travel into lower Manhattan, including steam railroad, ferry and tunnel commuters, aggregated approximately 336,000 passengers. This traffic is growing rapidly. During the last ten years it has increased about 117 per cent at the Grand Central Terminal. During nine years, the Long Island commuter traffic has increased 141 per cent at Flatbush and 275 per cent at the Pennsylvania Station. The commuters on the New Jersey Central, Lackawanna and Erie roads have increased approximately 40 per cent during the last ten years. These figures emphasize the fact that the commuter traffic has become a very great factor in our rapid transit problem. The growth of the traffic is so stupendous that the consequences will be very serious if immediate steps are not taken to deal adequately with it. A Metropolitan Transit Plan, separate and distinct from the Metropolitan transit system, should be devised for this purpose.

Mr. Turner's Summary

The public welfare demands that more street railways must be provided in order that better service may be furnished during the rush hours and during all hours of the day. For social reasons it is desirable that transit facilities should be extended into new territory as early as possible. For the same reasons, new lines of travel should be developed instead of following old ones. City transit should precede the population; it should not follow the population. If all of these principles are followed, then:

Congestion of population will be dissipated, not intensified;
The population will be distributed to the outermost limits of the city, not confined to population centers like the lower East Side of Manhattan.
The outlying sections of the city will be developed and enhanced in value, not depreciated.
The city's growth will be promoted, not retarded.
Universal transfer privileges can be established so that the passengers may ride between their homes and business for a single fare; and
The intolerable rush hour conditions will be eliminated. Every passenger will be able to travel to business in the morning and home at night, comfortably and decently.
In other words, if the transit plan is based upon the area served instead of upon the traffic in sight;
If municipal ownership is substituted for private ownership;
If operation by a private company under public control prevails instead of municipal operation, as proposed, or
In short, if city transit is developed in accordance with all of the foregoing principles, instead of those which have prevailed in the past;

then the New York City transit problem will be solved.

The Commission Plan proposes to follow such principles.

Discussion on Mr. Turner's Paper

The chairman of the session at which Mr. Turner's paper was presented was Nelson P. Lewis, consulting engineer Board of Estimate, city of New York, and until recently and for many years chief engineer of the board. Mr. Lewis explained that invitations to discuss the paper had been sent to representatives of all of the principal traction companies in the city, but each had expressed an unwillingness to give his views. He then introduced as the first speaker in the discussion Edward A. Roberts of the Beeler organization, and also connected with the engineering department of the commission.

Mr. Roberts explained that his remarks would be confined to the surface lines. Some people seem to think that they are an insignificant part of the transportation system of the city and they can be scrapped without great loss, but for every three passengers on the rapid transit lines there are more than two passengers on the surface lines. At one time the companies were in prosperous condition, but now the contrary is the case. Their present problem is in two parts, namely, to attract more passengers and to reduce expenses. These two objects are by no means incompatible. Rerouting is the first thing to be attacked in a case of this kind. Districts are constantly changing owing to business and social conditions, and to obtain the best results car routes should be frequently revised. Another important matter is the introduction of modern equipment, and the speaker described the beneficial results obtained on many railway systems through the operation of safety cars. Other means of obtaining the desired results are regularity of service, loading platforms, skip-stops, which the speaker said can better be designated as proper spacing of stops, and revision of time tables to reduce waste time. He then compared operation in New York and Boston as follows: Boston: Fare 10 cents, with 20 per cent of the passengers paying 5 cents; earnings per car-mile, 66 cents. New York: Fare 5 cents, earnings per car-mile, 68 cents. Boston: Revenue car-miles per car-hour, more than 10; earnings per car-hour, $6.62. New York: Revenue car-miles per car-hour, less than 7; earnings per car-hour, $4.71.

Mr. Roberts also pointed out that if it was possible to increase the schedule speed in New York by the moderate amount of only 1 m.p.h., which even then would leave New York considerably behind other large cities in point of speed, 13,000,000 car-miles could be added at practically no additional operating expense or capital outlay. These added car-miles would provide facilities for 125,000,000 passengers, or more than a 5-cent increase.

Frank J. Sprague, the next speaker, said that thirty years ago he visualized the needs of New York transit and laid down the underlying principles in the daily papers and in addresses before technical societies. His plan contemplated two four-track lines north and south each side of the city with a cross-town line extending through Williamsburg, Brooklyn and New York to Jersey City and Hoboken, crossing the north and south lines at a different level. The original Interborough line was built like a snake and when the logical H was formed the Forty-second Street shuttle with its illogical engineering features was the result. He said that in 1890 and 1891 the rapid transit commissioners did not know whether they wanted an underground or elevated railway, and an effort was made by certain interests to secure the right to build a steam-operated elevated railway up Broadway. At that time the speaker said he offered to run trains with electric power at 40 m.p.h. if given the opportunity. Continuing, he said that traffic facilities in New York had too long been a means to an end in private operation, though perhaps this was a necessity. In future designs it is most important to have routes and tracks utilized to the limit. If the present subways were operated by electric locomotives or single motor cars at the head of the trains the capacity would be so limited that the city would have to invest more than $100,000,000 in additional subways to secure the same capacity. Multiple-unit operation has made the present capacity possible. Logically, a train should be made up of like units, because then a train would have the same speed characteristics as a single car. Brakes are applied to every wheel and why should not motors be also? It would be interesting to see what could be accomplished with every wheel equipped and with the greatest possible speed, particularly on the local tracks. Much thought has been given recently to schemes for reducing expenses by keeping the number of trains and attendants at a minimum, but except for studies by Mr. Turner, particularly on spreading office hours, there has been little investigation as to how the passenger carrying capacity of the rapid transit lines can be increased without increasing their trackage.

Mr. Sprague then declared that the suggestion for a universal transfer in Mr. Turner's paper, in his opinion, was not sound, as it would decrease the capacity of the system. People would ask for transfers to ride short distances when they could just as well walk, and walking would be better for them. The sound basis was for a man to pay for what he got.

General Lincoln C. Andrews, in charge of the working organization of the Transit Commission, then said that while the picture painted by Mr. Turner was good, he was more interested to know what could be done during the next five years, as it would take five years to build a subway. There was a crying need for a solution.

H. M. Brinckerhoff, of Parsons, Klapp, Brinckerhoff & Douglas, was the next speaker. He said that he had checked off with a "no" and "yes" the con-

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clusions listed at the end of Mr. Turner's paper and had found more "nos" than "yes." He believed that Mr. Turner had treated the subject primarily on the basis of city development, but one must be on his guard against thinking that he can control city development by transit. Figures show that for a number of years the populations on the lower East Side and lower West Side of New York have changed very slightly in number and that the decrease in population in Manhattan has come from the central district. He thought that greater relief to these crowded tenement districts would come from sanitary measures than from transit changes. The present congestion in transit matters is more at the delivery end, and in developing new residential districts care must be taken that too many lines are not brought into the heart of the business district to increase the congestion already there. The speaker then referred to the experience in Chicago where some years ago elevated roads were built into the suburbs far in advance of the population. Now, Chicago has what might be known as the "twilight" district, just outside the business district, because people had moved from there to the more attractive residential districts outside. In referring to a paper which he had presented before the same section last year, Mr. Brinckerhoff said he had shown that the transit development in New York so far had been almost entirely north, east, and south. He hoped that the commission would see if it could not develop population more to the west. In conclusion he offered a defense of city planners who, he thought, were endeavoring to coordinate their work with that of adequate transit facilities.

T. K. Thomson said he thought the term "rush hour" was a misnomer because train and passenger movements at that time were slower than at other times.

John P. Fox pointed out that important office and business districts were being built up at various points along the rapid transit lines, citing the development of the Forty-second Street district as an example. He praised the idea of a four-track rapid transit line.

Internal Railway Motor Temperatures Control Capacity

In Paper Before Electrical Convention, Manufacturer's Engineer Outlined the Factors Which Determine Motor Heating and Suggested a Plan for Estimating Temperature Rise Under Operating Load

AT THE midwinter convention of the American Institute of Electrical Engineers, held during the past week in New York City, G. E. Luke, Westinghouse Electric & Manufacturing Company, read a paper entitled "Heating of Railway Motors in Service and on Test-Floor Runs." The purpose of the paper was to explain an original method for estimating the temperature rise in a motor when the continuous rating is known. On account of space limitations this method cannot be reproduced here; some of the facts cited by the author will be given, however, with a view to outlining the phenomena involved in motor heating. The substance of the paper, aside from the method, is given below.

Why Motor Selection Is Complicated

The selection of a proper motor for a particular railway service is without doubt one of the most difficult problems in motor application. The motor is subject to daily rush-hour loads; to possible heavy peak loads due to a steep track grade. In addition, it is called upon to deliver abnormal overloads resulting from conditions such as holiday crowds, trailer operation, snow or the necessity of pulling in a disabled car, and these conditions are apt to be accompanied by a low line voltage.

Railway motor failures may be classed as mechanical and electrical. Many of the electrical failures are due either to poor commutation and flashing or to excessive temperatures. In the modern commutating-pole motor mechanical failures, and those electrical ones which are caused by poor commutation, have been greatly reduced; however, the possibility of breakdown due to high operating temperatures is still present. The modern high-speed, ventilated, commutating-pole motor will deliver a much greater output per pound of motor than the early types of railway motors. This means of course that the motor's capacity for the storage of heat on short-time overloads has been reduced and has resulted in making the peak-load temperatures the predominating factor in some railway motor applications.

The adoption of simple tests which would be a criterion of a motor's performance in any railway service has been recognized as impractical. With such intermittent loads the best general method of rating should be based upon the motor's overload or thermal capacity and upon its continuous rating. Thus the standards of the American Institute of Electrical Engineers say that the nominal rating of a railway motor is that output which the motor will develop for one hour with a temperature rise by thermometer at the end of the run or not over 90 deg. C. on the commutator, and 75 deg. C. at any other normally accessible part. With this short-time run most of the heat loss is stored up in the motor.

Thus the one-hour rating is to a certain degree a measure of thermal capacity and continuous rating is a measure of ability to dissipate heat.

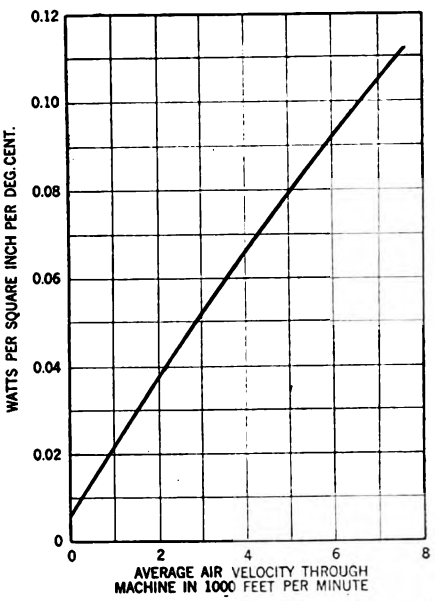

FIG. 1—CURVE SHOWING SURFACE HEAT DISSIPATION FROM RAILWAY MOTORS IN WATTS PER SQUARE INCH OF SURFACE PER DEGREE DIFFERENCE BETWEEN SURFACE AND AIR TEMPERATURE

With regard to ventilation there are three general classes of railway motors, namely, totally inclosed, self-ventilated and separately ventilated motors. The Institute rules define a "totally in-

DISTRIBUTION AND DISPOSAL OF LOSSES IN RAILWAY MOTORS

Type of Ventilation	Inclosed		Self-Ventilated				Separate Vent*	
Rating—Time	1 Hr.	Cont.	1 Hr.	Cont.	1 Hr.	Cont.	1 Hr.	Cont.
Volts	600	450	600	450	600	450	600	450
Hp	60	...	65	...	25	...	200	...
Amperes	88	36	95	60	37	35	280	220
Rev. per min	700	827	700	638	1,225	950	670	550
Weight of bare motor, pound	2,350	....	2,350	....	870	....	5,200	....
Weight armature, pound	615	....	615	....	225	....	1,700	....
Armature watts loss:								
Armature copper	1,800	301	2,100	840	820	733	3,980	2,450
Armature iron and stray power	1,170	560	1,170	620	780	500	3,250	2,500
One-half friction and windage	300	400	325	280	220	155	900	700
Brush loss	264	108	285	180	111	105	840	660
Total armature loss	3,534	1,369	3,880	1,920	1,931	1,493	8,970	5,310
Field copper loss	1,825	306	2,360	950	650	580	4,690	2,900
One-half friction and windage	300	400	325	280	220	155	900	700
Total motor loss	5,659	2,075	6,565	3,150	2,801	2,228	14,560	8,910
Per cent copper loss	64.0	29.2	67.9	56.8	52.5	59.0	59.5	60.0
Armature loss per cent of total	62.3	66.0	59.1	61.0	69.0	67.0	61.6	59.5
Watts loss lb. of motor	2.41	0.88	2.79	1.34	3.22	2.56	2.80	1.71
Armature loss lb. of armature	5.75	2.22	6.31	3.12	8.68	6.65	5.28	3.13
Armature copper loss/lb. copper	26.5	4.4	30.9	12.3	36.4	32.6	14.7	9.1
Field copper loss/lb. copper	7.1	1.9	9.1	3.7	9.1	8.1	8.7	5.4
Disposal of losses:								
Per cent absorbed	81.4	0	81.9	0	57.5	0	69.0	0
Per cent dissipated from frame	10.8	100	4.6	62.0	12.5	45.0	4.9	14.3
Per cent carried away by the ventilation air through motor	7.8	0	13.5	38.0	30.0	55.0	26.1	85.7

*Separate ventilation on the continuous rating only.

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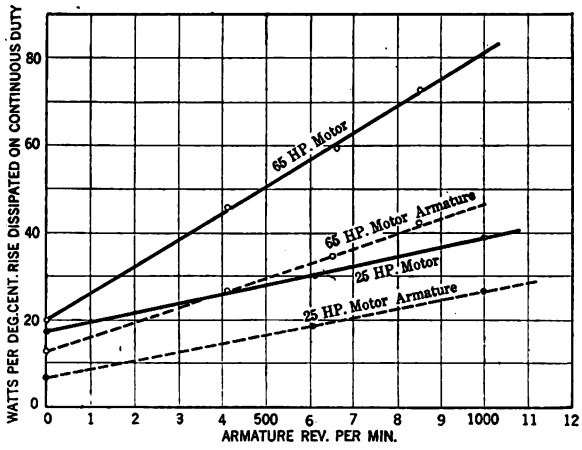

FIG. 2—MOTOR HEAT LOSS IN WATTS PER DEGREE RISE DISSIPATED AT VARIOUS SPEEDS AT THE CONTINUOUS RATINGS FOR THE MOTOR AND MOTOR ARMATURE

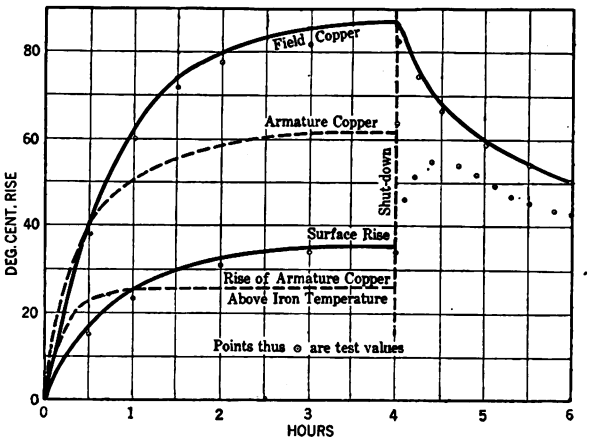

FIG. 3—HEATING CURVE OF 75-HP., 600-VOLT, DIRECT-CURRENT RAILWAY MOTOR, WITH FORCED VENTILATION. LOAD, 90 AMP. CURVES CALCULATED

closed" motor as one so inclosed as to prevent circulation of air between the inside and the outside of the case, but not sufficiently to be termed "airtight." A "self-ventilated" machine is one in which the ventilating air is circulated through the machine by a fan, blower or centrifugal device integral with the machine. A "separately ventilated" machine has its ventilating air supplied by an independent fan or blower external to the machine.

ONE-HOUR RATING IS PURELY ARBITRARY

The accompanying table gives the distribution of losses on four typical types of motors at the one-hour and the continuous rating. This nominal rating is purely an arbitrary one. As previously mentioned, the rating is intended to be a standard of measurement of a motor's thermal capacity. The requirement for this is that no heat loss shall be dissipated from the motor—that is, all of the losses must be stored in the motor masses. This condition is approximated in totally-inclosed machines where the heat loss from the external frame by radiation and convection rarely ever exceeds 10 per cent of the total loss.

In the early non-commutating-pole motors it was necessary to observe commutation carefully during this one-hour run, which required the removal of the commutator cover. This practice is still used in the modern motors. In fact, Rule 5202 of the standards of the A.I.E.E. says that the covers should be arranged to secure maximum ventilation without external blower.

Some of the self-ventilated motors will circulate as much as 50 per cent more air with all covers off than with covers on as in service. This has resulted in the nominal rating being dependent upon ventilation as well as the thermal capacity of the motor. The table shows that of the total loss, from 52.5 to 67.9 per cent is found in the armature. Since the weight of the armature is only about one-third of the total, its thermal capacity (ability to store heat) on short-time loads will be less than that of the motor as a unit. It results in an armature loss per pound of armature of 5.28 to 8.58 watts. The armature copper loss per pound of copper ranges from 14.7 to 36.4 watts. A loss of 4.5 watts per pound of armature will raise its temperature 75 deg. C. in one hour if all the loss is stored in the iron and copper. Hence in the 25-hp. high-speed motor at least 48 per cent of the total armature loss must be transferred elsewhere; with the larger motors this percentage is considerably reduced. A loss of 3.75 watts per pound of copper, if all stored in the metal, will raise its temperature 75 deg. C. in one hour. This means that toward the end of the one-hour run with this motor by far the greater part of the heat loss generated in the armature copper must be transferred to the iron or air and but little of that loss is stored.

On the one-hour run the motor losses are stored up in the iron and copper, carried away by the ventilating air through the motor and dissipated from the external frame by radiation and convection. The table referred to shows that of total loss about 81 per cent is stored in the motor parts for the first two motors, while for the last two more highly ventilated motors this percentage is 57.5 and 69. This shows that the one-hour rating is not a true indication of the motor's thermal capacity, since the percentage of the heat loss stored in the motor during this run is a function of the motor's ventilation.

On continuous duty all of the heat

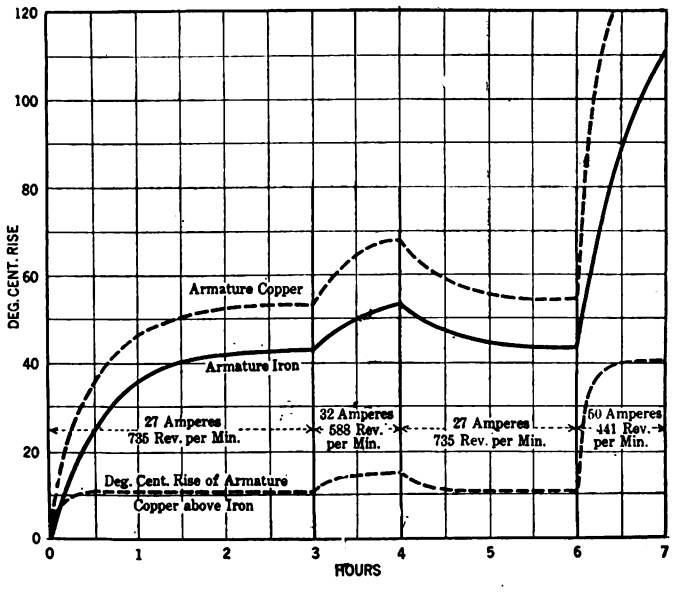

FIG. 4—HEATING CURVE OF ARMATURE IRON AND COPPER. 25-HP., 600-VOLT, DIRECT-CURRENT MOTOR

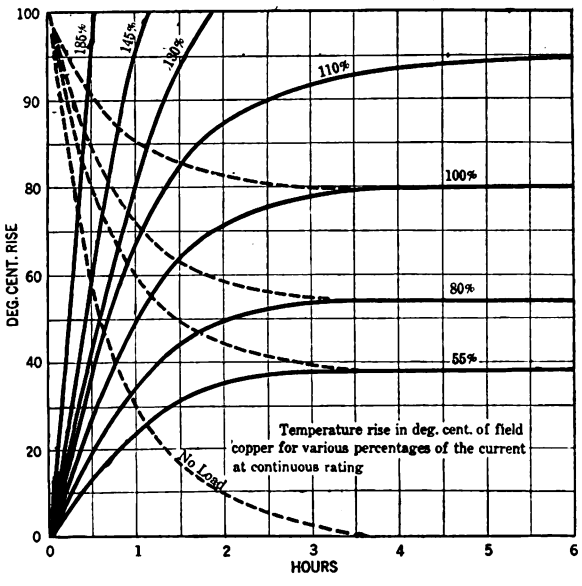

FIG. 5—HEATING AND COOLING CURVES. 75-HP., 600-VOLT, DIRECT-CURRENT RAILWAY MOTOR, SEPARATELY VENTILATED

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losses in the motor must be transferred to the surrounding air, that is, this rating is not affected by the heat storage capacity of the motor. In a totally-inclosed motor the total losses are transferred to the frame and are then liberated by radiation and convection. The frame temperature rise is approximately proportional to the watts per square inch to be liberated. The heat dissipated from the frame is about 0.013 watt per square inch of surface per degree rise. This is an average value from many tests. The surface is taken as that of a solid cylinder whose overall dimensions are equal to those of the motor. The actual effective surface is greater than this due to the roughness of the castings and the numerous irregular projections. This accounts for the high value of this constant, since the heat loss from a smooth surface due to natural convection and radiation is only about one-half of the above value. With a car speed of 10 m.p.h. the above constant is approximately doubled. The internal temperature drop from the armature to the frame is a function of the ventilating surface and the internal ventilation. It is evident that the external ventilation on the frame cannot effect this internal drop. The external frame rise on continuous duty averages about 60 per cent of the internal temperature rise when measured on the test floor by thermometers. The rating on an inclosed motor is limited by this low heat flow from the frame and by the temperature gradient necessary to cause the armature loss to be transmitted to the internal air and then from this air to the inner frame surface. For continuous-rated inclosed motors the weight per horsepower increases with the motor size. This may be seen, for example, by the fact that by doubling the motor's dimensions the external ventilating surface is increased to four times its first value while the weight is increased to eight times the original.

Ventilated Motors Are Superior

When air is circulated through a motor by either an internal or external fan the effect is twofold. It reduces the internal air temperature and for a given loss it decreases the temperature gradient between the ventilating surface and the internal air. It is possible to reduce this temperature drop to a very small value with separate ventilation; however, the internal insulation drop is still present. This temperature difference between the copper and the ventilating surface is the limitation to the degree of ventilation economically possible. Thus the table shows that the small 25-hp. self-ventilated motor on the continuous run can dissipate 2.56 watts per pound of motor while the heavy locomotive motor (insulated for 1,500 volts) with separate ventilation can get rid of only 1.71 watts on the basis of the same copper temperature rise. This is due to the large internal temperature drop in the windings and insulation of the larger motor which is independent of ventilation. The first two motors listed in the table give a comparison of continuous rating possible on a totally inclosed and a self-ventilated motor of the same weight. It shows that for the same internal temperature rise the inclosed motor can dissipate a loss of 2,075 watts while the self-ventilated motor can dissipate 3,150 watts. This difference will increase with the speed of the armature.

Test Data and Computations Showing Thermal Characteristics

Mr. Luke used his method of calculation to illustrate the performance of typical motors. His principal diagrams are reproduced herewith. Commenting upon the graphs he said that Figs. 3 and 4 illustrate the fact that the armature copper on the average ventilated motor has comparatively little thermal capacity. It is seen that on loads of thirty minutes or more practically all of the copper loss is being transferred through the insulation. The thermometer measurements will not give this internal temperature, hence it is possible to find a safe temperature rise on a motor by thermometer although the motor may be dangerously hot in the inaccessible parts.

There is no doubt that from the standpoint of weight and cost the modern ventilated railway motor has an inherent advantage over the totally inclosed motor. It has been shown that since the ventilated motor can get rid of more heat losses than the same motor inclosed it is possible to rate the motor higher. This increases the continuous rating without materially increasing the one-hour or overload rating. The effect of ventilation is to decrease the surface temperature and to increase the gradient between the copper and the surface temperature. When a ventilated motor is applied to an intermittent cycle such as found in railway service, full advantage of the continuous rating cannot be taken since a margin in temperature is necessary in order to carry the heavy peak loads.

With the heavy inclosed motors the ratio of the hour to the continuous rating is high so that the application of such a motor on the basis of the average root-mean-square current is generally safe. The inherent thermal capacity of the motor will usually take care of the peak loads.

On the other hand the tendency of increasing the ventilation is to bring the continuous and the hour rating together. Hence the economical application of the modern high-speed ventilated motors must be made with more care, and the motors' performance from a thermal standpoint on such applications should be known.

For standard motors, heating and cooling curves such as shown in Fig. 5 can be calculated which will facilitate the proper application of these motors. The solid lines are the heating curves at various loads, while the dash lines are the cooling curves either with no-load or with definite loads. The time origin can be shifted to suit the initial temperature conditions.

Conclusions

1. The temperature limitation is the predominating factor in railway motor application. This limitation is found in the maximum "hot-spot" temperature at the peak loads.

2. The armature copper has relatively little thermal capacity which may result in high internal temperature gradients on short-time loads.

3. The ratio of the one-hour to the continuous rating approaches unity as the ventilation of the motor is increased.

4. The application of the ventilated motor on the basis of the average root-mean-square current to an intermittent duty is incorrect if the maximum internal temperature at the peak load is ignored.

5. It is the maximum internal temperature which first starts insulation failure. Hence motor ratings should be based upon this temperature and not upon the surface temperature as measured by thermometer.

6. There is no fixed relation connecting the internal maximum and the surface temperature as found by thermometers. This relation is affected by insulation thickness, degree of ventilation, duration and magnitude of load, together with size and accessibility of the motor windings.

Twenty-eight Member Bodies in A. E. S. C.

THE American Railway Association (Engineering Division) and the Association of American Steel Manufacturers have become member bodies of the American Engineering Standards Committee, bringing the total number of national organizations represented up to twenty-eight and of representatives up to fifty-two. The official representative of the A. R. A. is E. A. Frink of the Seaboard Airline Railway. The steel manufacturerers have not yet selected their representative.

American Welding Society Now Issuing Monthly Magazine

THE American Welding Society, New York, began last month the publication of its proceedings in the form of a monthly magazine. It thus returns to its practice when organized in 1919. Its earlier journal proved too expensive and but one number was issued. Then followed a period of five months during which there was no official organ, but in April, 1920, arrangements were made with the *Welding Engineer* whereby a part of each number of this monthly was given over to the society's proceedings. This arrangement was abandoned mainly because it was found difficult to separate the proceedings of the society from other printed matter appearing in the *Welding Engineer*. Thus the separate binding of the proceedings was impracticable. Further, the publication of news items of the society, of local sections, of committee activities, etc., was not provided for under the previous arrangement, and this was felt to be an additional reason for beginning the publication of a society organ. In addition to the publication of technical papers, the first issue of the *Proceedings* contains the report of society activities.

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Hoover and Daugherty Agree on Proper Association Activities

Usefulness of Trade Associations Recognized and Limitations of Their Lawful Activities Defined—Publicity of Statistics the Answer—Of Interest to Electric Railways

IN CORRESPONDENCE made public on Thursday morning, it appears that Secretary Hoover and Attorney-General Daugherty have come to an informal agreement as to what trade associations may and may not do for their membership. This is a question which has been bothering the Department of Commerce for some time, in fact ever since Secretary Hoover took charge of the department. Mr. Hoover recognized immediately the advantages and desirabilities of trade associations, not only in the industries themselves but also in his work in trying to place the Department of Commerce in a position to assist American business. The many cases of litigation against various trade associations indicated a state of chaos or at least uncertainty as to what associations could and could not do under the law, and Mr. Hoover has been trying to outline certain principles so that, if associations function upon these principles, they would know their activities were sanctioned.

The correspondence consists of a letter dated Feb. 3 by Mr. Hoover to Attorney-General Daugherty, Mr. Daugherty's answer dated Feb. 8, and Mr. Hoover's reply dated Feb. 9. While much of the subject matter is concerned with those trade associations whose activities and statistics have to do with manufacturing industries—production, purchases, stocks, wages and costs and prices—parts of it are of interest to such associations as the American Electric Railway Association and the state and regional railway associations.

Leading up to his actual questions, Mr. Hoover says:

"The difficulty seems to lie in the determination of the means and methods that may be adopted to secure this necessary information. Little, if any, trouble is experienced in securing the admission that an individual may secure knowledge of these facts by any means that would not constitute an individual crime, and that he may use the information in such manner as his best judgment may tell him will bring him the greatest benefit.

"But when two individuals engaged in the same line of industry undertake to provide a means for securing facts necessary and essential to the economic and efficient conduct of their respective organizations, this form of endeavor seems to at once assume an aspect of difficulty that, in my judgment, is in no way justified by a proper consideration of the underlying necessities therefore.

"The individual sets up some form of instrumentality to secure the information without which, in the management of his business, he would be groping in the dark. His competitor across the street does the same thing, and each, securing his information in his own way, uses it as he sees fit, and the action of either one has not offended the majesty of the law. Yet, if the two seek to join the instrumentality each has used for information purposes and the same information is received through one instrumentality and the information given to each and it is used in the same way that it was before, it is suggested that the collective activity in the use of the consolidated instrumentality should not be permitted because of the greater ease and facility thereby afforded for the two individuals to make improper use of the information so acquired. In other words, the objection does not go to the instrumentality, but to the abuse of the information that may be secured through the collective means."

Later on Mr. Hoover says:

"Trade associations have been in existence for many years. The great majority are legitimate, both in form of organization and in activity. The minority, while lawfully organized under articles expressing lawful purposes, may engage in activities that are evidence of purpose contrary to and outside of the declared purposes in the articles of organization."

Mr. Hoover points out that there is propriety, generally speaking, in trade associations and that their lawful field of endeavor is large.

Of interest to railways is:

"Many of the trade associations securing and disseminating the statistical data mentioned have restricted the same to its membership, while others have undertaken to give the same to the public through the daily and the trade press concurrently with its members. The trade associations of the latter class are in the minority.

"Information lawfully secured regarding trade and economic conditions made public for the information of everyone cannot be harmful. Information secured solely for the benefit of members and of a character that puts the membership, by reason of the information, in a position of advantage as compared with the public without such information cannot be sanctioned by sound public policy. The act of securing the information and the use of it by the members of a particular organization may be perfectly lawful in itself, but it is my belief that good morals and a sense of fair dealing require the giving of the information secured in this collective manner to the public generally, to the end that all persons engaged in commercial transactions involving the information in question will be on an even footing.

* * * * * * *

"A majority of the associations collecting data of the nature indicated have distributed same only to members of the association, while others have undertaken to give the information to the public through the daily and trade papers. Publication of the information by these associations in the daily press has not been general, and its availability to the public has been largely through the medium of trade papers, and through the daily press to the extent that the latter may have been utilized. When published through trade papers this information should be released to members only after such publication.

Four of the ten direct questions from Mr. Hoover to Mr. Daugherty are also of interest:

"1. May a trade association provide for its members a standard or uniform system of cost accounting and recommend its use, provided that the costs so arrived at by the uniform method are not furnished by the members to each other or by the members of the association and by the lesser to the individual members?

"5. May a trade association arrange for the handling of the insurance of its members, including fire, industrial, indemnity, or group insurance. In other words, can the members of an industry, through the agency of a trade association, arrange for or place all of the insurance of the members?

"8. May a trade association, in cooperation with its members and acting for and in behalf of its members, handle all legislative questions that may affect the particular industry, regarding factories, trades, tariff, taxes, transportation, employers' liability and workmen's compensation, as well as the handling of rate litigation and railroad transportation questions?

"9. May a trade association, in cooperation with its members and acting for and in their behalf, undertake the promotion of closer relations between the particular industry and the federal and the state departments of government which may have administration of laws affecting the particular industry in any form?"

In connection with other questions he also refers to the question of wages.

Mr. Daugherty answers Mr. Hoover affirmatively except for two minor points. On one of these he says:

"With reference to the first paragraph, there is no apparent objection to a standard system of cost accounting, but I think associations should be warned to guard against uniform cost as to any item of expense."

The example he mentions is the uniform charge for stumpage made by some lumber associations.

The other point he raises has to do with the effect of uniform trademarks. He says:

"It seems to me therefore that it would be well to eliminate the latter clause in paragraph 6, to wit, 'and may the association engage in such form of promotion by furnishing trade labels, designs and trademarks for the use of its individual members?'"

In his letter dated Feb. 9 Secretary Hoover answers Mr. Daugherty's sec-

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ond objection by saying that his question referred not to a uniform trademark for all the products of the members of an association but rather to the association's activities in devising trademarks for various members of the association so that there would be no likelihood of confusion between trademarks, and ends by saying: "With this explanation I feel sure you will agree with me that our views on the matters presented are in complete accord."

Wisconsin Utilities to Meet

A JOINT meeting of the Wisconsin Electrical Association and the Wisconsin Gas Association will be held at the Hotel Pfister, Milwaukee, March 22, 23 and 24. One of the principal pieces of business that is expected to be transacted is the organization of a new association comprising all of the utilities of the state, probably under the name of Wisconsin Utilities Association. The program is to be divided up largely into group meetings in order to promote intimate discussion among men interested in the same subjects. The electric railway group will be conducted by W. G. Brooks, Westinghouse Electric and Manufacturing Company. Another group, on transmission line substation and distribution, will be conducted by George A. Mills, Eau Claire, Wis. There will also be group meetings on auditing, safety and sales work, in addition to joint programs on the morning and afternoon of March 23, and a joint banquet that evening. The program committee is actively at work in a special endeavor to make this one of the greatest conventions the associations have ever had.

Illinois Association Program

THE annual joint convention of the Illinois electric, electric railway and gas associations will be held at the Hotel Sherman, Chicago, March 15 and 16. There will be two joint sessions on Wednesday and Thursday mornings and a joint banquet on Wednesday evening, while the afternoon sessions will be devoted to the individual association meetings. At the Wednesday morning general session, in addition to the business meeting, there will be an address by B. J. Mullaney, director Illinois Committee on Public Utility Information. At the banquet that evening Senator William B. McKinley and Samuel Insull will be the speakers. On Thursday morning there will be an address by W. L. Goodwin, Society for Electrical Development, on "Some of Our Problems and How to Overcome Them." There will also be addresses by the three presidents of the national electric railway, electric and gas associations.

On Wednesday afternoon the electric railway section will have an individual session. These papers will be read:

"Possibilities of Through Billing and Routing of Freight Shipments," by Richard Breckenridge, Aurora, Elgin & Chicago Railroad. Discussion by W. H. Wylie, traffic manager Illinois Traction System, and C. L. Thompson, assistant to the president, Chicago, North Shore & Milwaukee Railway.

"Advertising the Electric Railway Service," by John J. Moran, Chicago, North Shore & Milwaukee Railway. Discussion by Luke Grant, Chicago Elevated Railroads, and J. T. Downey, National Railway Advertising Company.

"The Modern Electric Railway Franchise," by B. P. Alschuler, Aurora, Elgin & Chicago Railway, Aurora, Ill. Discussion by D. E. Parsons, general manager East St. Louis & Suburban Railway.

On Thursday afternoon the following papers will be presented before the electric railway section meeting:

"Design of a Satisfactory Safety Car for City and Interurban Service," by H. H. Adams, superintendent of equipment Chicago Surface Lines. Discussion by Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railway.

"Bus Lines as Aids to Electric Railway," by Earnest Farr, the Firestone Company, Akron, Ohio. Discussion by W. C. Sparks, vice-president Rockford & Interurban Railway, and W. G. Brooks, Westinghouse Electric & Manufacturing Company.

"Wood Preservation, Particularly as Applied to Preservation of Ties," by Mr. Waterman, Chicago, Burlington & Quincy Railroad. Discussion by Mr. Cameron, R. W. Hunt Company.

The electric section will have papers on Wednesday afternoon on investigation of the per capita energy consumption and on getting new business. On Thursday afternoon there will be papers on inductive interference, by John Leisenring, signal engineer, Illinois Traction System, on rural electric service and on development of higher power factor load.

American Engineering Standards Committee Active

Work on Wire and Cable Specifications Now Being Organized—Conference on Overhead Crossings Called for March 2 at Request of American Electric Railway Association

THE American Engineering Standards Committee has issued a statement regarding the status of a number of phases of its work.

As to the insulated wire and cable specifications, to which the American Electric Railway Association is a party, there are now sixteen groups of interests co-operating. Specific parts of the work have been assigned to twelve technical committees to which the following subjects, respectively, have been delegated: Definitions, copper conductors, stranding, rubber insulation, impregnated paper insulation, varnished cloth insulation, magnet wire, fibrous coverings, metallic coverings, standard make-ups, exports, and weatherproof, heat-resisting and similar material. W. A. Del Mar, chief engineer Habirshaw Electric Cable Company, is chairman of the sectional committee, and more than 130 engineers are participating in the work.

At the request of the American Electric Railway Association a conference is being called by the American Engineering Standards Committee to decide whether there shall be uniform specifications for the crossing of overhead wires, and to dispose if possible of certain differences of opinion in regard to those parts of the National Electrical Safety Code which deals with overhead lines. This conference will be held in New York City on March 2.

The following has been planned for the agenda of the conference:

1. Shall there be a set of national specifications for crossings between overhead electric wire lines and railways, and between different wire lines?

2. If so, what should be its relation on Part 2 of the National Electrical Safety Code, "Rules for the installation and maintenance of overhead and underground electrical supply and signal lines"?

3. Can disposition be made of the differences of opinion on Part 2 of the National Electrical Safety Code by (a) approving the present edition, (b) revising the present edition through a sectional committee of the American Engineering Standards Committee?

4. What procedure shall be recommended for carrying out the conclusions reached by the conference?

The American Electric Railway Association has summarized its reason for calling the conference as follows:

"For many years various associations and interests, either individually or jointly, have developed, and in many instances adopted, specifications intended to govern the construction of electric light, power, trolley, signal and communication lines across steam and electric railways.

"Recently the National Bureau of Standards has promulgated the National Electrical Safety Code, Part 2 of which applies to the general construction of overhead lines, including requirements at railroad crossings. The differences between the several specifications and codes has led to confusion.

"Realizing the desirability of having a standard that would be generally acceptable, the American Electric Railway Association as requested the American Engineering Standards Committee, by conference of the bodies interested, to determine the desirability of developing an 'American standard specification' which will include the requirements at railroad crossings."

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Mr. Henderson Answers the Witt Report

Superintendent of Seattle's Municipal Railway Disagrees With Expert Retained by City

D. W. Henderson, general superintendent of railways for the city of Seattle, Wash., has filed with the chairman of the city utilities committee his reply to the recent report of Peter Witt with respect to changes suggested by Mr. Witt in the methods of operation of the railway. Mr. Henderson is not in full agreement with Mr. Witt. Not by any means. One $800,000 saving which Mr. Witt said could be made by reductions in service, particularly in the business district, Mr. Henderson declared impracticable.

Another $800,000 which Mr. Witt declared could be saved by reducing the number of employees, Mr. Henderson said he found to be at best "greatly exaggerated," while virtually the only important item in which the superintendent agreed with the special investigator was in the need of 200 new cars, and the prediction that such a purchase would save about $100,000 a year for power.

Out of the Mr. Witt proposals, Mr. Henderson evolved the following outstanding recommendations, which he made with some additions of his own:

1. Purchase of 200 new cars, as proposed by Mr. Witt.
2. Rerouting of several north-end and hill car lines.
3. Use of one-man cars, though not to the extent proposed by Mr. Witt.
4. Construction of a car line to the Stadium.
5. Construction of a Cowen Park extension.

The new cars, Mr. Henderson said, might net a saving in the neighborhood of $100,000 on power and maintenance of equipment and track.

The reroutings he proposed would net another saving of $120,000, he said.

As to the one-man car plan, the superintendent said it is doubtful whether all lines should be operated on the one-man system, but there might possibly be a reduction of one-fourth of the present employees by adopting the method more fully. He added, however, that "we must not lose sight of the fact that it would be necessary to pay a one-man operator a higher wage than a two-man operator."

The Cowen Park extension, which Mr. Henderson has recommended several times, he said should be built along Fifteenth Avenue Northeast at the earliest possible opportunity, and as to the Stadium line, he said this should perhaps be constructed with aid from the general fund, or with the aid of the state or the university, as it would serve the general public and that institution.

On the first nine paragraphs of Mr. Witt's report, dealing largely with the history of the purchase of the street railway system, Mr. Henderson said he had no comment to make whatever.

On Mr. Witt's next five paragraphs, which criticized the operation of so many cars and lines over First, Second and Third Avenues, through the business district, Mr. Henderson said:

> At certain times of the day this is a fact, but during the peak hours of the day, from our observation, it is almost necessary to operate the number of cars which we are now operating on these different avenues, in order to take care of the amount of traffic on these streets.

Mr. Henderson said the revision of routes and schedules is kept constantly in mind in operating the railway, and that there are further changes in routings to be made from time to time which will benefit the public and effect economies in cost. Mr. Witt recommended certain reductions in the headway of cars on various lines, and reductions in the number of cars operated during off-peak hours. On this Mr. Henderson said it is true that the railway is now furnishing more seats during these hours than there are passengers, but that it would not do to operate the exact number of cars so there would be no vacant seats, as the people of Seattle voted to purchase the railway so that they could have better service, and they might have something to say regarding the kind of service which they should have.

Mr. Henderson did not concur in the recommendation by Mr. Witt that the through lines operating on First Avenue be split and the West Seattle cars turned back at Yesler Way. He said this would involve an extra cost in operation of forty-one car hours a day, at $2.55 a car hour, or $104.55 a day additional expense.

In addition, the superintendent said, it would greatly congest traffic around Yesler Way, and would work a hardship on passengers from the West Seattle district, inasmuch as the retail district has now moved to the vicinity of Pike and Pine Streets.

Trackless Trolley Plan Revived

Hopes for a trackless trolley between Dover and Harrisburg have again been revived. James I. Comely, Harrisburg, a representative of the Rossville & Dover Transit Company, asked the Borough Council, at Dover, that the ordinance giving the company the privilege of operating through Dover be extended for another year.

The ordinance was first drawn up five years ago and each succeeding year its extension had been asked. The Council granted the request. Mr. Comely stated that building operations had been held up because of the high price of material. He expressed the hope that the work may be started this summer.

Ceases to Urge Cincinnati Referendum on Service-at-Cost Ordinance

The citizens' committee, Cincinnati, Ohio, has discontinued its attempt to have a referendum on the amendment to the service-at-cost franchise ordinance which deferred collection of the 1922 franchise tax from the Cincinnati Traction Company. Suit filed by Eli G. Frankenstein, attorney for the committee to enjoin the amendment until the voters had passed on the question next August, also has been withdrawn. The following reasons are given by the committe for discontinuing its work on the referendum:

1. The ordinance provides that in determining the rate of fare that the $350,000 per annum franchise tax should not be reckoned.
2. This is done to hold down the rate of fare.
3. The city in reality waives nothing, since for three years it has not collected the franchise tax.
4. In order to earn this tax for the city (according to the 1918 ordinance) the Cincinnati Traction Company shall raise the rate of fare and thus exact the tax from the passenger.
5. As a tax producer for the city (the first paragraph of F, of Section 22, of the Ordinance No. 253—1918) it is a rank failure, and should be eliminated entirely, because of its discriminatory nature.
6. The committee therefore refuses to lend itself to an attempt to make an absurdity appear a reality.
7. Accordingly, Attorney Eli G. Frankenstein has agreed to withhold the suit in the Common Pleas Court against this ordinance.
8. This committee serves notice on the traction committee to be appointed by Mayor Carrel that it desires to have its representative appear before it, to discuss this and other phases of the trolley situation in order to find a solution of some of the traction problems and most particularly to eliminate the discriminatory tax feature.

Pittsburgh Traction Plan Heard Before Commission

Hearing on the proposed new franchise contract between the Philadelphia Company and the Pittsburgh Railways on the one hand and the city of Pittsburgh on the other was held recently before the Public Service Commission. The contract calls for the reorganization of the Pittsburgh Railways and the creation of a traction conference board in Pittsburgh. A. W. Robertson appeared in behalf of the railways and said that the traction conference was the only solution of the present condition of trolley administration in Pittsburgh.

The measure was opposed by the Allied Boards of Trade of Allegheny County through its representative, G. J. Schaefer. He believed that the city had suffered for twenty years the same conditions that the contract would perpetuate. He further thought that a merger of all the companies could be forced by the commission. Special Counsel Charles K. Robinson spoke in favor of the approval of the contract.

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Chicago Empowered to Build Subways

Attorneys for the local transportation committee of the City Council of Chicago, Ill., gave an opinion on Feb. 9 to the effect that Chicago can build subways at once without additional legislation. Immediately upon hearing this some of the Aldermen proposed that a start on subway construction be made with the traction fund, which amounts to about $30,000,000. No action was taken, however, by the committee. Meanwhile negotiations are progressing before the committee for a new franchise for the surface lines and possibly a consolidation with the elevated railway companies. Notice was served on the Chicago Surface Lines that the fare case would be reopened by the Illinois Commerce Commission on Feb. 14.

Construction of Line to Effect Saving Suggested

A saving of $15,000 may be effected by the construction of a street car line down First Avenue South, in Seattle, Wash., and along East Marginal Way to South Park, according to a recent statement by Superintendent of Seattle Municipal Railways D. W. Henderson to the utilities committee of the City Council. Mr. Henderson stated that the city pays the Puget Sound Power & Light Company $19,385 a year for the use of its tracks by the South Park cars between First Avenue South at Spokane Street and Georgetown. In addition to this, the city would save $3,820 a year in operating expenses, making a possible total saving of $23,205, with a conservative estimate of $15,000.

The report was made when Georgetown residents protested against the rerouting of the South Park cars. The committee voted to hold up the protest of the residents for thirty days to give Mr. Henderson an opportunity to test the plan. He said the line could be ready within three weeks after arrival of the rails.

Houston Franchise Renewed for Sixteen Years

The franchise of the Houston (Tex.) Traction Company was extended sixteen years when the City Council passed finally the ordinance agreed upon by city officials and attorneys for the traction company as a compromise in the controversy over fares and service in general. Passage of this ordinance marks the end of a controversy that has been hard fought during the last two years, both in and out of the courts.

Under the compromise arrangement the traction company agrees to spend $1,200,000 in the next two years in Houston in extensions and betterments. W. E. Wood, general manager of the traction company, has gone to Boston to confer with officials of Stone & Webster in regard to raising the capital to be spent in carrying out the terms of the grant.

In keeping with its agreement the City Council also passed a companion ordinance which reduced fares in the city of Houston to 6¼ cents when paid in metal tokens or street car tickets issued by the traction company. These may be purchased in amounts up to $1. Fares paid in cash will be charged at the regular rate of 7 cents. Sale of the tickets at the reduced price will begin in thirty days from the passage of the ordinance.

Committee Formed to Rebuild Old Line

L. M. Hoefler, attorney, Claus Spreckels Building, San Francisco, Cal., heads a committee of San Mateo County capitalists and citizens which proposes to rebuild the old Ocean Shore Railroad at a cost of approximately $1,500,000, of which $200,000 has already been subscribed by San Mateo County citizens. New rails will be laid on the old track-bed. The line will be operated with gasoline motor cars for passenger traffic and steam cars for freight.

Horace Nelson of the Bank of Half Moon Bay, Half Moon Bay, Cal., has been elected chairman of the San Mateo County committee to gather additional funds. Estimates of costs, etc., for the proposed work have been prepared by Engineer Major Edwin W. Moore who is associated with Mr. Hoefler.

$4,000,000 Interurban Project Proposed

Preliminary steps were taken recently by officials of the Indianapolis & Cincinnati Traction Company, following the annual meeting of shareholders, for the construction of the proposed line from Rushville to Cincinnati. According to an announcement made by Charles L. Henry, president of the company, bids have been asked for grading the roadbed and laying the track and the matter will be definitely decided after all bids have been received. The route decided upon extends from Rushville, through Andersonville, Metamora. Brookville, Harrison, Ohio, and Cincinnati, a distance of 70 miles through a rich agricultural territory that is not served by steam railroad or traction.

It would cost approximately $4,000,000 to build the line. The company already has acquired the greater part of the right-of-way, and if construction costs are not prohibitive, it is believed that work on the extension will be started this spring.

Mr. Henry, in submitting his annual report to the stockholders, advocated an early start being made on the new work, expressing the belief that construction costs have about reached bottom. He expressed confidence in the general business outlook for this year and said that while last year's operations were disappointing, depression was general but all indications seemed to point to a better situation during the coming months of the year. The stockholders re-elected officers and directors.

California Governor Intervenes in Rate Case

Recently the California State Railroad Commission granted an increase in rates on the Pacific Electric Lines. About the same time a 50 per cent increase was granted the Southern California Telephone Company on rates applying in the city of Los Angeles. Vigorous protests against these increases have been entered with Governor William D. Stephens by various committees and associations.

In consequence of these protests the Governor has addressed a communication to the Railroad Commission, in which he asks that either the present new rates granted by the commission be suspended until the service conditions are bettered or that the cases be entirely reopened for a more extensive detailed investigation. The matter of service referred to has particular reference to poor telephone and gas service complained of in Los Angeles. The Governor states that he has been able to secure first-hand information regarding the effect of the rates granted the Pacific Electric Railway and the telephone company during his recent stay in Los Angeles. He cites the general feeling of electric line commuters and telephone subscribers and asks that their needs be fully considered:

The Governor's letter follows in part:

I feel free to call these matters to your attention because you are an independent branch of our State government, over whose decisions and terms of office I have no control, and because these recent telephone and interurban rate increases, coming at a time when the public expected rates to fall with the general decline in prices, have resulted in a state of public bewilderment, which I fear may turn to public distrust of regulation.

I am deeply concerned over the future regulation of public utilities in this State. The success of our form of government depends upon public understanding of, and public confidence in, the acts of public servants. I am confident that upon the evidence presented you formed the conclusions which you believed to be fair and just. And while I have not had the opportunity of examining the voluminous evidence submitted to the commission, I cannot ignore what seems to be the conviction of an overwhelming number of our citizens, that some other solution might have been possible in the cases referred to.

For example, it is urged by the ratepayers, that "it is not just to burden lucrative lines with high rates in order to make up a 'fair return' upon lines barely paying operating costs," and that "gift property of a non-paying line should not be given its full present value when fixing rates for a profitably operated line." These and other contentions are being urged so seriously as to deserve further and fullest consideration.

And may I not properly direct your attention to the statements that were made by officials of the Pacific Electric and other great public utility corporations at the hearings before the Legislature on the King tax bill, wherein said officials attempted to show that the physical values of their properties had not only not increased but in fact had greatly decreased. The King tax bill did not raise the tax rates of any interurban or street railway.

I suggest to you, that this whole matter should be reopened, not merely to a rehearing on the evidence already offered, but that it should be gone into *de novo* and thrown open to all parties interested. And I suggest that, until it is known what is right and just, the increases should be suspended or revoked, if lawfully it can be done. If revocation is legally barred, then may I not suggest a corresponding monthly rebate to every subscriber until the service (telephone) rendered warrants an increase.

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Mr. Mitten's Case

All Philadelphia Talking About Fight for Control Which Threatens Present Management

"Give 'em hell, pop!"

This is the admonition made in a letter addressed to President Thomas E. Mitten by a correspondent pledging support to the present management of the Philadelphia Rapid Transit Company in the fight against the five bolting directors. The expression of sentiment thus recorded may be lacking in elegance, but no one can quarrel with it on the ground that it lacks clearness and force. Moreover, it is a sentiment that is being reiterated everywhere, so that the controversy for control has become the one important topic of conversation in all Philadelphia.

Lively Newspaper Comment

It certainly is no usual occurrence that prompted the editor of the Philadelphia *North American* in the issue of Feb. 7 to run an editorial set two columns wide the entire depth of the paper and concluded with the sentiment "the people of Philadelphia will stand a good deal, but they would not tolerate action that would throw the street railway back into chaos." Oh, yes, that was the *North American*, some will object. Wait a moment. If you are inclined to look askance at this quotation then consider the staid *Public Ledger*. It is "some" occasion when that paper raises its voice to warn against "the uncertain prospect of another policy and another viewpoint in dealing with the employees."

The "Give 'em hell" admonition is being posted in all the carhouses as a slogan. All Philadelphia is taking it up. Of course it will be votes and not a slogan that will win at the coming election, but in all electric railway history there never was a case in which similar questions were presented for settlement.

A New Phrase, "Gold Diggers"

"'Em," of course, means the faction among the directors opposed to Mr. Mitten. "Pop," of course, means Mr. Mitten himself. Besides "'Em" the directors opposing Mr. Mitten have become known as the "Gold Diggers." This term was concocted to be applied to the bolting directors as a peculiarly fitting appellation. The plan of the "Gold Diggers," so it is explained, is to seize the property, depose Mr. Mitten and then work the road entirely in their own selfish interest. Whether or not you accept this statement to be true depends of course on whether you happen to be a Mitten partisan.

One thing, however, is certain. The employees are rallying to the support of Mr. Mitten with all the resources at their command. Although Mr. Mitten advised them against entering the fight with any of their own personal funds or the funds of the Employees Co-operative Association they have chosen to disregard the warning in their efforts to help him and have purchased 10,000 shares of stock and pledged them to the aid of Mr. Mitten.

Not only did they do this, but a delegation from the men bearing the resolutions containing the signatures of 10,000 employees called upon W. J. Montgomery, one of the opposition directors, at his office in the Eighth National Bank. They implored him by a letter presented to him personally "to give us your proxy to vote in our interest so that we can go back and tell the men that the whole thing has been a big mistake and they can go on working contentedly." Mr. Montgomery received the delegation silently but politely. That was all. This was the word brought back by the spokesman himself.

While their ownership in the company is a source of strength to the employees, it is also a source of weakness, for should Mr. Mitten be unhorsed or his policies changed the employees would find themselves loaded up with shares in a company with the management and policies of which they might no longer find themselves fully in accord.

The Issues Stated

But what do the directors opposing Mr. Mitten want, anyway? They want "a real part in the management of the company's affairs." Those are the exact words. As for Mr. Mitten, what does he want? His most significant want now is a share in the earnings of the company for the employees, that share to be dependent upon and commensurate with the skill which the men show in increasing the profits of the company. Mr. Mitten has said publicly that he is making it a condition of his continued management of the property—a thing he is going to ask the stockholders to do—that the employees shall receive financial recognition beyond the average of the four cities upon which the Philadelphia wage is based, "because you deliver a quality of service that they know nothing about." Here are Mr. Mitten's own words:

> What I want to say to the stockholders at the next annual meeting on March 15 is that for the super-co-operation I expect you will produce, they shall assent to my paying to the men and women at the close of the year, after the payment of the P. R. T. dividend, a co-operative wage dividend, which shall be within the net income earned, the added net income earned by this super-co-operation, and that it shall not for this year exceed 10 per cent of the payroll.

Street railways have been known before to have caused a whole city to talk about them, but never for quite the same reasons as those that govern now in Philadelphia. As if Mr. Mitten's remarks and the news items and editorials in the papers were not enough full page advertisements have appeared in the dailies containing these and similar statements:

> Think of it, folks! A dozen years ago many of our people actually didn't know where the next meal was coming from. Helpless slaves of an unconscionable machine that eventually goaded them into a desperate attempt to break the shackles of industrial despotism.
>
> Face the facts, folks! I have not spared our part in the débâcle of 1910, and I'll not spare those who, before God and man, were most responsible for that tragedy. Names highly placed in Philadelphia's social directory sucked the cream, while the men who operated their road had to be content with the skim milk.
>
> In 1910 we were first cousins to an almshouse. Today, we are a responsible, law-abiding, industrious body of men and women. Better railroaders, better citizens, better family men. We're making good, folks, on the only real chance we've ever had.
>
> We have said that Mitten's enemies are our enemies. Well so they are, and why shouldn't they be? Have we anything to look forward to under the leadership of men who seek covertly to destroy what we have been eleven years building?

Is it any wonder all Philadelphia hangs breathless, as it were, on the outcome?

167 Miles of Municipal Line in Detroit

Detroit's municipal railway system observed its first birthday anniversary on Jan. 16, 1922, the first city-owned car having been run over the Charlevoix-St. Jean line of Jan. 16 last year. During the year the city has acquired a system of 167 miles of track. Of this 117 miles are in operation. Sixty miles were built, 29 miles bought from the Detroit United Railway under the day-to-day agreement and the remaining mileage is under joint operation.

According to Joseph S. Goodwin about 50 more miles will be in operation early in February, including the Grand Belt and the Epworth-Highfield lines. Passengers are being carried at the rate of 60,000,000 per year and 428 cars are being operated. Forty-five Peter Witt cars have been put in operation and 128 cars purchased from the Detroit United Railway. The remainder of the cars are safety cars. The municipal railway force numbers 1,423 employees, 561 in the operating forces and 468 on construction work.

The addition of 9 miles of new track just completed will close up the gaps and complete a new outer belt line 35 miles long which will serve thickly settled districts now in need of car service.

The new belt line will extend from the Charlevoix-Buchanan municipal lines on the west, northerly over Junction Avenue and the Epworth Highfield lines and complete the belt by connecting with the Charlevoix-Buchanan line again at Van Dyke on the east. Some of these sections have been operated individually, but will be connected into the main system.

Milwaukee Electrification Discussed

Plans for the electrification of the steam railroads in Milwaukee, Wis., are being discussed by a special committee of City Council, railroad representatives, railroad rate commissioners, the city attorney and various engineering societies.

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Super-Power Report to Be Discussed Further

Now that ample time has been given to secure the reactions of the electrical industry to the super-power report, the members of the advisory board are to be called together in the near future for further discussion of the project.

Dr. George Otis Smith, the director of the United States Geological Survey, under whose direction the super-power report was prepared, believes that the showing of economics presented in the report has stimulated interconnection between existing systems throughout the country. The nation-wide interest that has been taken in the report is indicated by the fact that the entire edition of 10,000 copies of the report has been exhausted. In addition literally thousands of inquiries have been received in regard to various phases of the problems involved. Other evidences of the interest aroused, Dr. Smith points out, are had in the space given to this project in the technical press and the large amount of discussion which it has incited in technical societies. The exact date of the meeting of the advisory board had not been fixed at the time of this writing.

Commerce Secretary Hoover states that the super-power report has stimulated the desire for similar studies in the Pittsburgh-Chicago area and in other sections.

Suggestions Offered for Railway's Consideration

At the reorganization meeting of the City Council of Johnstown, Pa., recently, Mayor Cauffel suggested ways by which the city could take its place as one of the leading second-class cities. He said that the Johnstown Traction Company should be petitioned to pay the city a certain percentage of fares collected on lines to Luna Park; that it was only fair that the company should help maintain the park, the heavy traffic to which adds considerably to the funds of the railway.

In his readjustment plan he urged a reduction of the 7-cent fare in view of the reduction in wages, and would call upon the railway to do what it could for the transportation of school children. He said it would be a splendid spirit of community pride for the railway to grant the children the privilege of riding for 1 cent.

Pacific Grove Franchise Attacked

Alleging that the Monterey & Pacific Grove Railway, Monterey, Cal., has failed to pay its franchise tax of 2 per cent of its gross annual receipts since Jan. 1, 1918, and that it has abandoned operation on part of its line in Pacific Grove, the state of California and the city of Pacific Grove have brought suit against the company. They ask that the franchise, which Pacific Grove gave the company, be declared forfeited.

The trustees of Pacific Grove on Jan. 3 passed a resolution declaring the franchise forfeited.

The company operates an electric line between Del Monte, Monterey and Pacific Grove. No cars have been operated for three years over the line in Pacific Grove extending from the corner of Lighthouse Avenue and Nineteenth Street, to the intersection of Nineteenth Street, Briggs Avenue and Ocean View Avenue, and thence westerly along Briggs Avenue to the Southern Pacific Railroad depot.

Negotiations Over Interurban Suspended

Because one member of the City Council of Saginaw, Mich., opposed a proposed franchise for the Michigan Railroad for its Flint to Bay City line negotiations between John C. Weadock, New York, and the Council ended on Feb. 14, when Mr. Weadock, representing the utility, took the position that it was needless to go any further. Since the Saginaw-Bay City Railway went into the hands of a receiver and ceased operating city cars on Aug. 10 the interurban line has operated by permission of the Council.

The state and city plan to improve Genesee Avenue to the southerly city limits this summer and asked the interurban to move its tracks from the side of the road to the center for a distance of about a mile. It was believed the interurban was willing to meet all city terms, but Commissioner Phoenix took the position that if the city or some railway other than the interurban desired to operate on the streets used by the interurban, permission should be granted and no rental should be charged, the joint user of the tracks merely being required to assist in making repairs. The next move is now up to the Council. It is believed that rather than lose $100,000 which the state would contribute to the cost of the pavement, interurban cars will be stopped at the city limits. Action along this line will not develop, it is expected, before Feb. 22.

Auto Club and Railway Co-operate for "Safety"

Close co-operation between the Des Moines (Iowa) City Railway and the Des Moines Auto club was arranged at a recent meeting of the directors of the auto club with D. M. Finch, head of the claims department for the railway. The two organizations will sponsor a "safety week" within a very short time looking toward educating the public in the elimination of accidents.

In the meeting plans were discussed for arriving at a better understanding of present city ordinances in regard to automobiles passing unloading cars, cutting in ahead of street cars and driving at an excessive speed. The two clubs will have charts prepared illustrating the causes of the majority of accidents in Des Moines and suggesting means of precaution which will result in cutting down the number of accidents. Mr. Finch told the automobile club that efforts would be made to enlist the active support of every motorman and conductor in the Des Moines force to join in the safety week campaign.

Wages Reduced in Duluth

New rates of pay on the Duluth Street Railway in both Duluth and Superior became effective on Jan. 16. They affect all conductors and motormen. The extra list is reduced to six motormen and conductors, guaranteed a minimum of $3.25 a day. If this list is enlarged the men will rotate. At the present time there are fifteen extra crews, but the company finds runs daily for most of them.

Herbert Warren, vice-president of the company, says that it was found necessary in the interests of sound economy to ask the men to take a cut at this time.

The final hearing on the fare matter, now pending before the State Railroad & Warehouse Commission, was set to be held at St. Paul on Jan. 31.

HOURLY RATES OF PAY FOR CONDUCTORS AND MOTORMEN IN DULUTH, MINN.

(Cents per hour)

	First 3 Months	Second 3 Months	First 6 Months	Second 6 Months	Second Year	Third Year	Fourth Year	Fifth Year	Sixth Year	Seventh Year	Eighth Year
Previous to 12/1/90*	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½
12/1/90 to 9/30/92*	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
10/1/92 to 8/31/93*	13¾	13¾	14⅜	14⅜	16	16	16	16	16	16	16
9/1/93 to 10/31/96*	12	12	13¾	13¾	14½	14½	14½	14½	14½	14½	14½
11/1/96 to 3/31/99*	11½	11½	12½	12½	13½	13½	13½	13½	13½	13½	13½
April 1, 1899	15	16	..	17	17	17	17	17	17	17	17
May 1, 1900	..	..	17	17	18	18	18	18	18	18	18
June 1, 1902	..	..	18	20	20	20	20	20	20	20	20
Jan. 1, 1906	..	..	20	20	20	21	21	22	22	22	22
June, 1907	..	..	21	21	22	23	24	25	25	25	25
July 1, 1912	..	..	22	23	24	25	26	26	27	27	28
March 1, 1916	..	..	23	24	26	27	28	29	30	30	30
Oct. 1, 1916	..	..	26	26	28	29	30	31	32	32	32
June 1, 1917†	..	..	28.6	28.6	29.4	30.45	31.5	32.55	33.6	33.6	33.6
Oct. 1, 1917	..	..	29	29	31	32	33	34	35	35	35
April 1, 1918	..	..	32	32	33	34	35	36	37	37	37
Aug. 1, 1918	..	..	34	34	35	36	37	38	40	40	40
Sept. 1, 1918	..	..	38	38	40	42	42	42	42	42	42
Aug. 1, 1919	..	..	41	41	43	45	45	45	45	45	45
Oct. 1, 1919	..	..	44	44	46	48	50	50	50	50	50
Oct. 1, 1920	..	..	49	49	51	53	55	55	55	55	55
Jan. 16, 1922	..	..	44	44	46	48	50	50	50	50	50

* Previous to March 31, 1899, monthly wages were paid on basis of twelve hours' work a day on every day of the month. Such wages are shown above reduced to an hourly basis for a thirty-one-day month.

† Including war bonus.

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Subways Considered a Luxury

Although not yet convinced that Detroit needs a more rapid system of transportation at the present time and under present conditions, Mayor James Couzens will appear before the next State Legislature to ask permission to raise the bonding limit for public utilities from 2 per cent to 4 per cent, according to a recent announcement. The Mayor said that for years the matter has been discussed and considered by public officials. He is willing to build anything the people ask and vote the money to build with. He will not advocate doing that which experts advise is financially impracticable.

In announcing that he would move to have the bonding limit raised, the Mayor drew attention to the fact that if the Legislature granted such permission, the action could not become effective before August, 1923, and the city's needs at that time cannot be definitely anticipated now. With the first step taken leading to financing rapid transit, part of the problem would be solved in case the people should decide upon subways or elevated lines.

At present Mayor Couzens considers subways for Detroit would be a luxury and to construct such a system as would satisfy the people would necessitate the expenditure of $100,000,000. The city at this time cannot afford to spend this amount, which would be necessary to treat all sections of the city alike. Elevateds are not favored by the city officials and it is the Mayor's belief that the people would not tolerate an elevated system. People on the east and west sides of the city would not be willing to mortgage their property to build a subway to relieve North Detroit alone, but anything that is to be done must be done for the whole city.

The 2 per cent of the assessed valuation as now provided for limits the issuance of public utility bonds to $36,000,000. The increase to 4 per cent would provide for bonds to the amount of $72,000,000 or more should the present valuation be increased.

Light-Weight Interurban Cars Inspected

The General Electric Company entertained a delegation of electric railway executives from various parts of the United States and J. Furukawa, engineer of the Imperial Railways of Japan, with a dinner and theater party at Cincinnati (Ohio) on Feb. 7. The entertainment followed an inspection of the new light-weight interurban cars being built by the Cincinnati (Ohio) Car Company for the Kentucky Traction & Terminal Company, Lexington Ky. At the plant of the Cincinnati Car Company every detail of construction of the cars was explained. The visitors also were shown the cars in the various stages of construction.

On the evening of Feb. 7 the dinner was served at the Hotel Gibson. J. P. Pope, general manager of the Kentucky Traction & Terminal Company, was toastmaster.

A New Coxey's Army

Lew Shank of Indianapolis in a New Mob Scene Staged in Protest to Commission Decision

For the first time in the history of the city of Indianapolis, Ind., the public was treated to the spectacle of a newly elected Mayor leading an embryo Coxey's army to the State House to protest against a Public Utilities Commission decision. Two of the daily papers treated the matter from a strictly news standpoint, but a paper generally unfavorable to the public utilities issued a demand for at least regular procedure in settling rate questions. Still another paper sought to make a political issue out of the demonstration.

After a parade from the City Hall, the crowd, which was headed by a band, stood massed on the south lawn of the State House for nearly a half hour, while Mayor Shank denounced the commission for its recent order permitting the Indiana Electric Company to issue $17,496,000 of securities, and roundly criticised and ridiculed members of the commission. He included Governor McCray in his remarks.

The Mayor sent a committee into the Governor's office to ask him and the commission members to come out. The Governor sent back word that he would receive whatever delegation cared to come into his office. The Mayor then left for the City Hall without seeing the Governor or the members of the commission, but, after considerable delay, the committee and a few of the persons who had jammed the corridors went into the Governor's office and through their spokesmen presented their protest.

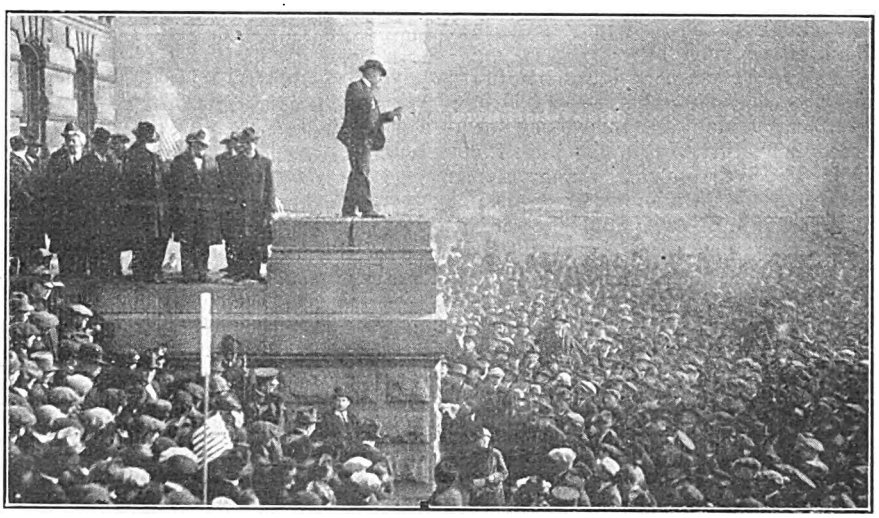
Governor McCray suggested that they go to the office of the commission and have the commission explain its order, but none of the delegates appeared there.

The demand that members of the Public Service Commission be discharged was never made. In fact, the only attack on the commission was made by the Mayor in his speech on the outside, and the Governor and the other state officials did not hear this speech.

The official call issued by Mayor Shank for the parade at the State House was as follows:

> I, Samuel Lewis Shank, Mayor of the city of Indianapolis, this 28th day of January, 1922, request all good citizens who believe in the rights of the people and the control of their own city affairs, to join the many hundreds of taxpayers and citizens in a just and lawful protest, at the Indiana State Capitol, Monday at 10 a.m., against the manner in which our public utilities are handled by the State. This is not a mob nor a bunch of "hoodlums" but a just demonstration to show the Governor that we are opposed to any increase in rates or in permitting any merger of electric light companies, gas companies, water companies and traction companies into one large combination.

The agitation in Indianapolis against the decision has not been without effect, for the city of Kokomo and various other Indianapolis industrial concerns have filed a petition with the commission asking for a rehearing of the case.



LEW SHANK IN ACT OF ADDRESSING THE MULTITUDE FROM THE STATE HOUSE STEPS

The petition contains fifty-one paragraphs, each setting out a reason why the order complained should not stand. The petition contends the corporation is not a utility and cannot legally function as a utility. The petitioners object further that the order was issued on an amended petition filed after the original petition had been decided. On the subject of capitalization, the petitioners object that the capitalization authorized is in excess of the total capitalization of the companies involved. The purchase of the utilities is characterized as a merger and as such, the petitioners aver, does not comply with the utilities law. The petitioners object to holding companies and contend the order of the commission adds another holding company to five already in existence. The petition goes into considerable detail on the involved ownership of most of the utilities concerned.

One of the principal contentions is that the commission does not show the companies are able to make a fair return on the securities authorized, and the order does not show the income will be sufficient to meet fixed charges.

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Bus Regulation a Problem

When negotiations between the City Council and the Northern Ohio Traction & Light Company, Akron, Ohio, are resumed shortly, relative to a new permanent franchise for operation of the local Akron lines, the matter of the jitney service is expected to play an important part in whatever amiable settlement is reached.

It is considered probable that the company in seeking a service-at cost franchise with the city, will endeavor to have incorporated in the franchise ordinance a provision which will restrict or at least regulate bus operation in the city. A check by the company shows that jitneys and buses are carrying an average of 20,000 passengers daily. This means that in a year's time jitneys and buses take $350,000 to $375,000 a year in revenue away from the railway. Last year there were 589 jitneys and buses in operation as compared with 489 in 1920.

Officials of the company say that should jitney and bus traffic be regulated and reduced, a lower car fare might be possible. The railway is now operating under an emergency ordinance providing for a flat 5-cent car fare. The previous rate was six tickets for a quarter. Under a new franchise a sliding rate of fare would be sought. based upon the rate of return.

To Know and Be Known Campaign Started

A campaign to "humanize" the Indianapolis, Columbus & Eastern Traction Company, formerly a part of the Ohio Electric Traction system, has been launched by the receiver, J. H. McClure. Motormen and conductors have been requested to learn the names of those patrons who travel regularly on their cars and to greet them by name whenever possible. The names of the members of the crew of each car are also posted on the car in a prominent place.

By injecting a more personal relationship between the traveling public and the employees, the receiver believes that many causes of complaint will be eliminated and that benefits will be shown in increased patronage of the traction line.

Send in Your Name!

The National Safety Council is now taking a census of all the persons engaged in safety and industrial health work in the public utility industries, as well as all persons engaged in these activities in every other industry and in public safety work also. To date it has never been established definitely how many persons in the public utility industries are engaged in accident prevention and industrial health work, or how the various types of utilities compare with each other or with other industries in this respect.

The census will include not only members and employees of members of the National Safety Council, but all persons engaged in safety and industrial health activities and not connected with the council at all. Many of the largest electric railways are members of the council.

Every reader of the ELECTRIC RAILWAY JOURNAL who is professionally engaged in industrial or public accident prevention or industrial health work—whether he is devoting all or only part of his time to accident prevention—is urged to assist in the taking of this census by sending his name to the National Safety Council, 168 North Michigan Avenue, Chicago, which will furnish a census form to be filled out and returned to the council.

News Notes

Toronto Votes to Buy Railway.—By a vote of 16,087 to 13,580 Toronto recently voted a by-law authorizing the City Council to buy the Toronto Suburban Railway. This line is owned by the Dominion government and operated as part of the Canadian National Railways.

Another Railroad Considers Use of Motor Car.—Gasoline motor car interurban service between Evansville, Ind., and New Harmony, is being considered by officials of the Illinois Central Railroad. The company will take off the steam trains on the branch of the road from Stewartsville to New Harmony because they no longer pay and motor cars are being considered for use in their place. New Harmony is about 30 miles west of Evansville and about 10 miles from Stewartsville.

Bill Provides for New Commission.—The present session of the South Carolina Senate has passed a new law providing for the formation of a new State Railroad Commission to consist of seven members, one from each congressional district of the State, and its consolidation with the present Public Service Commission. The Railroad Commission now has only three members. The new commission will have full charge of public utility rate matters in the State, and other details of public utility operation, if the bill is also passed by the House.

Winnipeg Mayor Lauds Conciliation.—The policy of conciliation which the Winnipeg (Man.) Electric Railway and the city of Winnipeg have followed in regard to traction problems was praised in the Mayor's inaugural address recently. The problem is a financial one now, the Mayor said. The company contends it cannot get money for the necessary work, unless it has an extension of its existing franchise beyond 1927. On that date, he explained, the city has the right under the franchise to take over the traction lines if it has given one year's notice of its intention. The Mayor urged that the matter of municipal ownership be carefully considered.

Wants to Acquire Railway Property.—The committee on harbors and public lands of the Massachusetts Legislature has voted in favor of a resolution to authorize the Mount Tom Reservation commissioners to acquire from George Pellissier, assistant general manager of the Holyoke Street Railway, a tract of land comprising about five acres, including the celebrated Dinosaur Ledge, with its tracks of the mammals of prehistoric times. This property, adjoining Mountain Park, has been owned for many years by electric railway interests.

Mayor Defends Railway. — When Mayor Crawford of Mobile, Ala., objected to the adoption of a resolution by Commissioner Hartwell, that the city accept a lease of one dollar a year for certain railway lines of the city as advertised by the Mobile Light & Railway Company, the resolution went over for consideration at a later date. The Mayor defended the railway, saying he did not be believe it to be the policy of the railroad to abandon its lines or furnish the people with inadequate service as charged by Mr. Hartwell.

Favors Separate Franchises.—The community committee, which has been devising plans for a solution of the franchise difficulties confronting the Aurora and Elgin city line and the interurban lines of the Fox River division of the Aurora, Elgin & Chicago Railroad, have gone on record as disapproving a uniform franchise for all the cities served by the company. Judge Evan A. Evans has been notified of the committee's attitude. The auditing of the traction company's books will be conducted by the corporation counsels of Aurora, Elgin and Dundee, assisted by a valuation expert, an electrical engineer and an accountant from the Illinois Commerce Commission.

Hamilton Company Needs 5-Cent Fare.—Mayor Coppley of Hamilton, Ont., is in favor of reopening negotiations with the Hamilton Street Railway to accomplish, if possible, restoration of adequate service on the part of the company and financial relief from the city by means of a straight 5-cent fare. E. P. Coleman, general manager of the Dominion Power & Transmission Company, which controls the Hamilton Street Railway, said that nothing less than the 5-cent fare would relieve the financial distress of the company. He said that if the eight limited tickets for 25 cents were withdrawn receipts would be increased approximately $50,000 only, but that the withdrawal of six unlimited tickets for 25 cents would add $150,000 to the income yearly. The adoption of a straight 5-cent fare was defeated by Hamilton voters at the polls on Jan. 2. The City Council, however, has the power to approve of the 5-cent fare, and it is considered possible that the Council may disregard the voters' decision and increase the fare to some extent at least.

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Financial and Corporate

City a Hard Bargainer

Detroit Indicates Local Railway Must Pay Huge Price for Its Campaign of Opposition

In a letter to the stockholders of the Detroit (Mich.) United Railway, the Street Railway Commission outlined and reviewed past conditions in the city of Detroit and stated that the city has now reached a position where it desires to extend its municipal railway system to all parts of the city and particularly on streets where franchises of the Detroit United Railway have expired. This represents approximately 150 miles of single track. It is a question either of construction or purchase. The letter was read by the Mayor at the stockholders meeting to which he was admitted as the owner of one share.

The Street Railway Commission warned the company that the city has always attempted to solve the railway question without destroying the value of the system to the city, but that the point in the controversy has been reached where final action must be speedily taken. The letter further states that if the stockholders do not authorize the sale of the property to the city on terms satisfactory to the city or empower the directors or a committee to arrange the sale subject to the ratification by the stockholders at a special meeting called promptly for that purpose, further negotiations would be considered of no avail by the commission and each side should then proceed according to its legal rights. This enforcement of its legal rights by the city would, it is believed, include carrying out the terms of the ouster ordinance forcing the company to remove its tracks from Woodward Avenue and Fort Street.

In reviewing the past the commission cites that in each step made by the city looking toward municipal ownership the company has opposed the desires of the people by lawsuits and propaganda. A specific instance cited is the attack made by the company on the validity of the election of 1919 in which it was sought by a series of lawsuits to defeat the entire municipal ownership program and to enjoin the city from constructing the municipal railway system or from marketing the issue of bonds sought to be sold to provide funds to build the municipal railway. The number of lawsuits started and the surprising positions taken in the lawsuits by the company and its attorneys are mentioned. At the present time there is still pending a suit in which one of the company's officials seeks to have the election of April 5, 1920, declared void.

Despite this attitude on the part of the company, the city system has been built and is in operation, but the cost to the city in interest charges on the bonds sold has been much greater than would have been required except for the lawsuits.

The commission stated that it had had its street railway organization make an estimate of the value of the company's property, except real estate, in the city and the value placed upon it after proper deduction for depreciation is approximately the sum of $16,500,000. This is substantially on the basis of the inventory contained in the agreement of March, 1919, certain changes being made necessary by reason of a different number of cars and a difference in the number of miles of track. The estimate also includes the assessed value of real estate included in the former agreement. This valuation would be increased by the difference between the assessed valuation of the real estate and its actual value.

The commission considers the suggested price of $24,500,000 for the company's city system inclusive of real estate, as mentioned by the directors' committee, entirely too high.

Bondholders Called Upon for Cash in Reorganization Plan

The reorganization plan of the Aurora, Elgin & Chicago Railroad, Third Rail Division, Wheaton, Ill., has been completed by the committee of which R. M. Stinson, Philadelphia, is chairman. The committee represented the first and refunding mortgage 5 per cent bonds due in 1946 and three-year collateral trust notes due in 1921, secured by the first and refunding mortgage bonds.

A new operating company will be incorporated to take title to most of the property and continue operation. The capitalization of this operating company will consist of common stock in an amount approved by the Illinois Commerce Commission. There will also be created a refunding and improvement mortgage by means of which funds can be provided to meet present and future capital requirements and refund the present 5 per cent bonds.

First and refunding bondholders agreeing to the plan of reorganization must pay $35 per $1,000 bond, the pro rata share of the expenses of the committee. They will receive a $500 face value 6 per cent debenture bond of a holding company. Upon payment of $200 in cash they will receive a $200 face value 7 per cent refunding and improvement bond of the new operating company, $700 face value of the 6 per cent debenture bonds of the holding company and three shares of the holding company common stock voting trust certificates. A similar plan has been worked out for holders of the three-year collateral notes.

$25,305 Loss in Des Moines in December

Beneficial results of operation under the provisions of the new franchise are shown in the financial report of the Des Moines (Iowa) City Railway for the month of December, 1921. Although the report shows the company still operating in "the red," the tendency is toward an improvement.

The fact that there was bus competition during the first twenty-seven days of the month caused a loss in revenue figured at $31,000 and in addition there was an extraordinary expense amounting to $9,000 for the reinstallation of the substation equipment which was removed last May. If it had not been for these two items it is thought the figures would have shown a balance on the right side of the ledger of $16,000 instead of a deficit of $23,305.

Revenues	
Transportation revenue	$173,746
Other revenue	8,789
Total revenue	$182,535
Operating expenses and taxes	
Operating expenses (including depreciation)	$154,910
Taxes	14,000
Total	$168,910
Fixed charges	
Bond interest	$20,312
Loan and note interest	16,618
Total fixed charges	$36,930
Deficit	$23,305

During December the company operated 124 cars during the rush hours and seventy-two during the non-rush hours. Since then additional cars have been put on and on Feb. 11 General Manager Chambers announced a further increase during shopping hours for the University line, one of the heaviest in the city.

The figures shown in the December report are given in the table above.

Preferred Stockholders Protected in Reorganization

Slow progress is being made by those back of the movement initiated by the stockholders' protective committee to block the reorganization plan of the American Cities Company. The preferred stockholders, who had until Feb. 11 to join in an effort to stop the execution of the reorganization, were tardy in responding to the invitation extended to them to depost their shares.

According to S. A. Trufant, chairman of the stockholders' committee, the equity of the preferred stockholders would be wiped out if the proposed plan were carried into effect, hence the need of concerted action by stockholders.

L. G. Root, New Orleans, representing Isidore Newman & Son, local bankers, in a published statement, has called to his aid figures intended to convince holders of preferred stock that under the plan contemplated they will not only be protected in whatever equity they may have, but by participating in the reorganization will be able to obtain 7 per cent income bonds worth more than twice as much as their original investment.

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Reorganization Plan in Preparation

Efforts at reorganizing the Cleveland, Southwestern & Columbus Railway, which, since Jan. 20, has been operated under the receivership of F. H. Wilson, formerly president of the company, are now being made by Hayden, Miller & Company, Cleveland, investment bankers. That company was requested by more than a majority of the holders of the $3,628,000, par value, of the company's first consolidated mortgage bonds maturing April 1, 1927, to attempt the reorganization.

In a letter sent out by Hayden, Miller & Company, addressed to the holders of the bonds and stocks of the

Cleveland & Elyria Electric Railroad 6 per cent bonds, extended to Feb. 1, 1923.
Elyria & Oberlin Electric Railway 6 per cent bonds, extended to Aug. 1, 1922.
Cleveland, Borea, Elyria & Oberlin Railway 5 per cent bonds, extended to Feb. 1, 1923.
Cleveland, Elyria & Western Railway 5 per cent bonds, matured Aug. 1, 1920, extended at 7 per cent to Feb. 1, 1923.
Elyria, Grafton & Southern Railway 5 per cent bonds, matured Jan. 1, 1922.
Cleveland & Southwestern Traction Company 5 per cent bonds, maturing Feb. 1, 1923.
Ohio Central Traction Company 5 per cent bonds, matured June 1, 1919, extended at 7 per cent to Feb. 1, 1923.
Ohio Central Traction Company 5 per cent bonds, maturing March 1, 1923.
Norwalk Gas & Electric Company 6 per cent bonds, extended to Feb. 1, 1923.
Cleveland, Southwestern & Columbus Railway 5 per cent bonds, maturing April 1, 1927.
The preferred and common stock of the Cleveland, Southwestern & Columbus Railway.

it is stated:

Although needed as a strict measure of preservation of the property of the railroad, it is believed that the receivership will offer an opportunity for a reorganization advantageous to all security holders.

Based on careful studies which have been made for some time of the railroad properties, its earnings and future opportunities, a plan of reorganization is now in course of preparation which it is hoped, can be submitted to the security holders within the next thirty days. Upon submission of such plan, all security holders will be given the opportunity of depositing their securities with trust company depositaries in Cleveland and in several other financial centers. No deposits of securities will be asked except upon final formation of the plan.

$189,620 Net Income for Hagerstown & Frederick Railway

After deducting interest charges, preferred dividend payments and other items, the net income of the Hagerstown and Frederick Railway, Frederick, Md., for the twelve months ended Dec. 31 last totaled $189,620, equivalent to approximately 12 per cent on the $1,500,000 outstanding common stock.

Gross revenues for the year totaled $2,047,611, an increase of $31,388 over 1920, while operating expenses were reduced, the total being $1,166,075, or $114,916 less than the year before. Gross income amounted to $931,307, or $183,007 more than in 1920. After interest charge deductions, net income is given as $282,620, or a gain of $72,229 for the year.

The dividend on the preferred stock issue, together with other items, amounted to $93,000, leaving final net income or surplus of $189,620. The corporate surplus as of Dec. 31, 1921, totaled $536,145.

$892,389 Increase in Net

Eastern Massachusetts Street Railway Went from a Deficit of $660,535 to the Profit Mentioned, or a Change of $1,552,925

Another Massachusetts road has made a remarkable record of earnings in 1921. It is the Eastern Massachusetts Street Railway. The net income of that company for the year recently closed was $892,389. This compares with a deficit of $660,535 for the previous year. Thus the real gain is $1,552,925. There have of course been a number of contributing factors to this showing, but of them none perhaps stands out more noticeably than the one-man car.

In December, 1921, 96 per cent of the total miles operated was by one-man cars. The trustees say very frankly that these cars have provided the means of reducing fares and continuing in existence a large part of the system, including many city lines which otherwise could not have been operated. They saved the company $1,250,216.

The trustees present the accompanying report for year ended Dec. 31, 1921.

COMBINED FINANCIAL STATEMENT OF THE 17 OPERATING DISTRICTS

	1921	1920
Passenger revenue	$10,681,350	$12,374,409
Freight and other revenue	36,899	286,403
Rentals, advertising, etc.	265,122	253,997
Interest—Other income	334,891	280,464
Total revenue	$11,318,264	$13,195,275
Expenses:		
Way and structures	$1,768,078	$1,973,583
Equipment	1,518,279	1,874,077
Power	1,350,996	2,050,120
Car operation	2,658,888	5,006,125
Injuries and damages	362,312	313,638
Insurance	†153,961	141,050
Law expense	9,912	15,784
Rent of tracks	79,017	105,141
General wages and expenses	263,910	293,625
Miscellaneous expenses	288,745	290,501
Operating expenses	$8,454,103	$12,063,648
Taxes	348,750	204,017
Gross income	2,515,410	927,609
Interest and rentals	1,623,021	1,588,145
Net income	$892,389	*$660,535*

Cost of service requires gross income of approximately $2,400,000. Operating expenses includes depreciation charges amounting to $1,146,806 in 1920 and $992,847 in 1921.
† Includes $80,000.00 added to insurance fund.
Note—Italics denote deficit.

Gross receipts from car fares in 1921 were $1,693,060, or 13 per cent less than in 1920. This was due principally to the continued industrial depression affecting every city and town in the system. In the textile and shoe and leather centres, especially, the prolonged unemployment of thousands of operatives inevitably caused a very large falling off in revenues.

A considerable part of this shrinkage of receipts, however, is accounted for by fare reductions made in different districts, in accordance with the service-at-cost plan of the public control act. These reductions have resulted in a saving of approximately $600,000 to the car riders, and represent an investment in good will and confidence in this street railway which has materially aided the Public Trustees in maintaining friendly relations with the public.

In the past year 35,000 joints have been electrically welded, this being a larger number than in the entire previous history of the company. The trustees propose to have all joints on rebuilt track welded as rapidly as possible and then turn attention to joints on other trackage. It is expected that track work during another season will put the operated rails in satisfactory condition. The tracks were well maintained during the past year at less cost than in 1920, and all buildings in active use have been kept in good condition.

Equipment expenditures were reduced $355,797, or 19 per cent. Contributing causes were the operation of 250 new one-man cars, improved track conditions and better shop management. Equipment expenditures were 7.67 cents per car mile, compared with 8.30 cents in 1920. The equipment is rapidly being placed in first-class condition and it will be the policy of the company to so maintain it hereafter.

Fare Reductions

Provisions of the service-at-cost plan control the fixing of fares in the operating districts. Each district is operated as if it were a separate street railway. Earnings and expenses are accounted for independently in these districts, and itemized financial statements are made available for public inspection. During 1919 and 1920 expenses increased rapidly, and it was necessary to raise fares. In 1921 expenses gradually decreased, and the public trustees have reduced fares accordingly. Net earnings so improved in some districts that more than one fare reduction was made during the year.

One dollar punch card tickets are now sold at the rate of 6¼ cents a ride in Lowell, Salem and Quincy; 5 15/17 cents a ride in Lawrence and Brockton; 5 5/9 cents a ride in Lynn, and 5 cents a ride in Fall River. About 87 per cent of the city riders on this property are now using reduced rate tickets.

The trustees say that full, free and frank discussions with municipal officials and service committees at numerous conferences have had a tendency to brush aside misunderstandings and in many instances, brought about improvements in service and fare reductions which a failure of co-operation might have made extremely difficult if not impossible.

Power costs were reduced $699,123 or 34 per cent. Reduction in coal prices, installation of oil burning machinery at the Quincy Station, the use of lighter weight cars and more efficient power house operation have been factors in this large saving.

Operation of cars shows a reduction in cost of $2,347,236. Of this saving $1,250,216 is attributable to the operation of one-man cars. The balance was due to consolidation of carhouses, more favorable winter conditions in 1921 and more economical car operation.

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Injuries and damages increased somewhat due to collisions between cars and motor vehicles. Reckless driving by motor vehicle operators is the principal cause. No increase in accidents or damages can be traced to the change from two to one-man operated cars, as the trustees say.

In 1920 the public trustees, after an analysis of the fire record of the company for thirty years, decided that the company should insure itself against fire and established an insurance fund of $100,000. The fire losses for 1920 and 1921 were $28,779, and the insurance premiums at the usual rates would have been approximately $120,572. The trustees propose to add to the insurance fund from time to time until it amounts to $200,000. A fire prevention inspector is constantly visiting all fire risks to see that they are adequately protected. All important carhouses have sprinkler protection. In 1921 the company organized the Eastern Mutual Insurance Company. Liability Insurance for employees industrial accident is carried with this company at a considerable saving in cost.

The trustees acknowledge their indebtedness to the local service committees for their assistance in solving many railway problems. The members of these committees have taken a keen interest in street railway affairs and given much valuable advice to the local management regarding service, fares, and other matters affecting the car rider.

Underlying bonds	$5,160000
Serial bonds	2,833,000
Bay State equipment notes	784,000
Refunding bonds 4½ Series A	14,956,000
Refunding bonds 5 Series B	2,834,400
Refunding bonds 6 Series C	972,000
Refunding bonds 6 Series D	798,700
Refunding bonds 6 Series E	500,000
Total bonds	$28,838,100
First preferred stock 6 per cent	4,058,800
*Preferred B stock 6 per cent	2,996,800
*Adjustment stock 5 per cent	8,711,200
Common stock	8,362,600
Total stock	24,129,400
Total all securities	$52,967,500

*Dividends on the preferred "B" stock and adjustment stock can be paid in cash or common stock.

In December, 1920, the trustees provided group life insurance for the benefit of the supervisory employees, the amount of the policies varying with the years of service, with a maximum of $3,000 in ten years.

In January, 1922, the trustees established a pension plan for employees seventy years old who have been continuously in the service for more than 25 years.

The labor agreement with the employees expired on May 1, 1921, and the disputed questions were submitted to the State Board of Conciliation and Arbitration. The board reduced wages an average of 12 per cent and relieved the company from certain burdensome and expensive war time conditions. The trustees immediately passed along to the car riders by reduction in fares the entire saving made possible by the State Board award.

The State of Massachusetts paid on Jan. 1, 1920 and 1921, a total of $100,000 matured serial bonds, in accordance with the special act of 1918. The State collected this amount from the cities and towns served by the company. On Jan. 1, 1922, the company repaid to the cities and towns the amounts advanced with interest, and also paid $300,000 serial bonds which matured on the same date.

The readjustment of securities proposed by the public trustees was declared effective on Jan. 3, 1922, and it is hoped to have all details consummated within a few weeks. The adjustment of deferred interest and accrued dividends places the company in a strong financial position and should enable it to build up necessary credit. The readjusted capital will be about as shown in the accompanying table.

New York Appraisal Figures Expected Soon

The work of appraising the railroad properties in New York City is virtually finished. The job began on May 6, when the appraisers were appointed by the Transit Commission in connection with the work of that body as directed to be carried out by the Legislature. It was said then that the preliminary work would be completed within six months.

What the figures show is not yet revealed, but it has been estimated roughly that the outstanding securities of the various traction companies aggregate a face value of $1,200,000,000, and that the valuation figure of the appraisers will be about $800,000,000.

The appraisal, it was said, would disclose the cost of replacement, compared with the original cost, on the basis of the value of the properties in 1914, and on the present value. Small attention, it was said, would be paid to the present cost of replacement. All the items are subject to deduction for depreciation.

Columbus Railway Coming Back

At the meeting of the board of directors of the Columbus Railway Power & Light Company, Columbus, Ohio, on Feb. 3, it was found that all fourteen members of the board were in accord with plans and activities of the management. As was stated in the ELECTRIC RAILWAY JOURNAL of Feb. 11 all officers were re-elected for the current year. It was brought out at this meeting that the company is entirely out of debt except for some back obligations to the city of Columbus and the liabilities as to bondholders and stockholders. The board voted to ask approval of the stockholders to permit the issuance of additional A and B preferred stock in amounts sufficient to pay the accumulated dividends on the same; and to ask the holders of these preferred stocks to take their back dividends up to April 1, 1922, in the new issue of similar stock.

March 18 Fixed as Date for Sale Under Foreclosure

The property of the Springfield, Troy & Piqua Traction Company, operating between Springfield, Ohio, and Troy, Ohio, will be offered for sale at public auction at the Clark County Court House on March 18 by the receiver, George Whysall. Approval of the order and date for the sale was set by Federal Judge John E. Sater in the United States Court at Columbus on Feb. 11. The court authorized the receiver to accept any bid in excess of $125,000 for the line. The highest bidder must pay down $25,000 at the time the bid is accepted, half of the remainder in thirty-five days and the balance within seventy-five days under the court's order.

This will be the second time that the traction line has been offered for sale since it was placed in the hands of a receiver several months ago. Some time back the property was sold to the bondholders of the road, through Guy M. Walker, New York, the trustee. When Mr. Walker failed to carry out his agreement with the court, the sale was set aside on application of the receiver.

While residents along the line are making every effort to secure a return of service, suspended about eight months ago, there appears to be little hope that it will be restored, and it is expected that the road will be junked by the purchaser if one can be found. Since the suspension of service, only a "shuttle car" has been in operation, this running between Springfield and the Victor Rubber Company at Maitland, a distance of 2 miles, and being operated solely to carry the plant's employees to and from work. Some switching operations in Springfield have also been carried out for local industries.

$843,000 in Certificates Offered

Stone & Webster, New York, N. Y., are offering $843,000 of Electric Railway Equipment Securities Corporation 6½ per cent equipment first gold certificates. The certificates are dated Feb. 1, 1922. They will mature quarterly May 1, 1922, to Feb. 1, 1927, inclusive.

The Electric Railway Equipment Securities Corporation, all of whose stock is owned by the General Electric Company, Westinghouse Electric & Manufacturing Company and the J. G. Brill Company, has been organized to assist in financing the purchase of standard electric car equipment. These certificates represent less than 75 per cent of the original cost of the equipment, the remainder having been paid in cash. As security, rental payments of the lessee companies are guaranteed by the Electric Railway Equipment Securities Corporation, which has obligated itself that at no time shall it have outstanding equipment trust certificates or other evidences of indebtedness in excess of ten times the amount of paid in capital.

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Railway Changes Name

The Interurban Railway, Des Moines, Iowa, will in the future be known as the Des Moines & Central Iowa Company. This action was taken at the recent annual meeting of the road and is the result of a desire to give the road a name which would be more distinctive. The plan has been under consideration for some time and for several months all passenger cars have borne a legend "The Des Moines and Central Iowa Route."

Reports Surplus of $16,956

The Washington Water Power Company, Spokane, Wash., realized a gross revenue of $4,778,554 for the year ended Dec. 31, 1921. In 1920 this item amounted to $4,604,893. The net income was $2,462,970 against $2,299,737 a year ago. After paying dividends out of the balance of $1,101,256 a surplus remained of $16,956. In 1920 the surplus realized was $5,378. The balance sheet as of Dec. 31 shows cash amounting to $237,139; notes payable $642,669 and total assets and liabilities of $32,244,707.

Balance After Dividends Reduced

The annual report of the Republic Railway & Light Company, New York, N. Y., for the year ended Dec. 31, 1921, shows a balance of $347,992 after taxes, charges, etc., equal to $6.70 per share earned on $5,191,400 preferred stock. The full 6 per cent dividend was earned notwithstanding a material increase in the fixed charges due to the cost of refinancing maturing obligations at a higher rate of interest.

Details of the income account for the year compared with 1920 are shown in the following table:

	1921	1920
Gross earnings	$7,321,679	$8,420,366
Operating expenses and taxes	5,391,369	6,556,393
	$1,930,310	$1,663,993
Other income	372,378	156,219
	$2,302,688	$2,020,212
Interest and discount	1,520,361	1,228,976
Surplus	$782,387	$791,235
Balance after preferred dividends of subsidiary companies	$347,992	$431,172

While gross earnings decreased 13.04 per cent due to depression in industry, such substantial economies were effected that operating expenses were reduced 17.77 per cent, so that net income available for fixed charges increased 13.93 per cent.

During the year subsidiaries sold $750,000 of 8 per cent gold notes and $750,000 of 8 per cent preferred stock. The preferred stock was sold largely to customers and employees. At the present time 67½ per cent of the employees are stockholders.

More than one-half of the gross earnings were derived from lighting and power. On Dec. 31, 1921, there were 42,629 power and light customers, a net increase of 12 per cent for the year.

On Oct. 1 the company introduced on the lines it controls in Youngstown a weekly pass sold for $1.25 which has been a substantial success, gross earnings from railway having materially increased and competition from jitneys reduced.

Financial News Notes

Will Increase Capital Stock.—The Wichita Falls (Tex.) Electric Company, which owns and operates the railway in that city, has filed an amendment to its charter increasing the capital stock from $1,775,000 to $2,275,000.

Dividend Increased. — The United Power & Transportation Company, Camden, N. J., has declared a dividend of $1.85 per share payable Jan. 31. This compares with $1.60 a share the last previous dividend.

Seeks Discontinuance. — A petition has been filed with the Illinois Commerce Commission by F. W. Rekman, receiver of the Joliet & Eastern Traction Company, Joliet, Ill., seeking permission to discontinue operation of the line. The receiver says that the company is financially unable to continue business.

Directors Re-Elected.—Stockholders and directors of the Texas Electric Railway, at their annual meeting in Dallas, Tex., recently re-elected Jack Beall of Dallas as president, re-elected members of the board of directors and transacted other business. The annual report of Mr. Beall as president of the company was presented and approved.

Winnipeg Reports Net of $649,420.—For the eleven months ended Nov. 30, 1921, the Winnipeg (Man.) Electric Railway realized a net income of $649,420 against $518,909 for the same period a year ago. The gross earnings amounted to $5,032,069 for the eleven months' period of this year and the expenses including taxes amounted to $3,732,099.

Reports Wanted for Assessment Purposes.—Public utilities of Oklahoma, including electric interurban lines and street railway systems, are being notified by Frank Carter, state auditor, that reports of their operations, for assessment purposes, must be in the hands of the auditor before March 1, 1922. It is declared that the schedule of assessments in most cases for 1922 will probably be the same as for 1921.

Surplus of $1,783,437 in Richmond.—For the twelve months ended Dec. 31, 1921, the Virgina Railway & Power Company, Richmond, Va., realized $10,173,334 in gross earnings, with net earnings of $3,105,672. After paying stock dividends on preferred etc., a surplus of $1,783,437 remained. The balance sheet as of Dec. 31, shows cash amounting to $827,649. Total assets and liabilities amount to $48,275,477.

Abandonment Opposed.—The meeting held recently at Rockville, Conn., to consider the discontinuance of the interurban service on the line of the Connecticut Company between that city and Hartford ended without any decision. The project was bitterly opposed by the municipal authorities of Rockville. The abandoning of the line was also opposed by others. There will be another meeting on the matter before any decision is made.

Wants to Abandon Line.—The Pittsburg County Railway, McAlester, Okla., has filed a petition with the State Corporation Commission seeking permission to abandon its line from Osage Avenue to the eastern limits of the city and from that point to the country club. The company claims that if this line is continued it will have to spend about $7,000 for paving and for changes of rails and ties on North Main Street and $18,000 on Seneca Avenue. The application will be heard on Feb. 16.

To Join in Cincinnati Reorganization.—Following an investigation of the motives underlying the proposed reorganization of the Cincinnati (Ohio) Street Railway, members of the board of directors of the Chamber of Commerce have announced that they will appoint a representative of their organization to serve on the special citizens' committee to be appointed by Mayor George P. Carrel. The board of directors had postponed action until further investigation of the underlying motives could be made.

County Commissioners Oppose Abandonment.—The Hamilton County (Ohio) Commissioners have filed a protest with the Public Utilities Commission at Columbus, Ohio, against granting the application of the Interurban Railway & Terminal Company for authority to abandon its New Richmond and Lebanon (Ohio) division. The commissioners contend that the franchise granted by the county to the traction company constitutes a contract and that the commission is without authority to affect it. The interurban company was granted a twenty-five-year franchise in 1901.

Texas Property Submits Reports.—The Texas Electric Railway, Dallas, Tex., has filed with M. G. James, city secretary, its annual financial statement covering operations during the year 1921. The report shows the annual operating cost of the line to be $2,199,929, while the gross earnings amounted to $2,889,838. The value of the "tangible assets" is placed at $8,895,606, of which $211,836 is in cash on hand. The company paid out $115,174 for damage suits, during the year, and spent $114,059 on repairs. The company has outstanding $10,500,000 in capital stock.

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Traffic and Transportation

Fare Measure Likely to Go Before Voters

Two measures affecting fares on the Seattle (Wash.) Municipal Railway probably will be submitted to the voters at the city election next May. The two proposals are Councilman Fitzgerald's referendum ordinance, providing for a 5-cent fare, with any deficit charged against the general fund, and Councilman Oliver T. Erickson's initiative ordinance.

The Fitzgerald ordinance provides for a 5-cent fare, with a 2-cent transfer charge, and the deficit made up out of taxation. If passed by the Council and approved by acting Mayor Robert B. Hesketh it will be placed on the spring ballot.

The Erickson scheme, provided in an initiative ordinance for which sufficient signatures have been presented to assure its appearance on the ballot in May, would place all the cost of operation and maintenance of the street railway on the general fund, increasing the tax levy for municipal purposes by something over $5,000,000, or approximately 20 mills. The interest and principal on the $15,000,000 bonds awarded to Stone & Webster interests in payment for the railway, under Erickson's plan, would be paid out of revenues accumulated from a fare which would be sufficient to cover these charges and to set aside out of each fare 1½ cent for extensions and betterments. The interest and principal this year amount to approximately $1,500,000. By this scheme Mr. Erickson asserts the fare would be 3 cents, the deficit to be made up by approximately 20 mills addition to the tax rate.

Ticket Tampering No Longer Tolerated

On Jan. 1, 1922, the British Columbia Electric Railway, Vancouver, B. C., started enforcing the terms of the contract governing the sale and use of fifty-ride tickets on its Central Park interurban line. These tickets are sold on the condition that they must be used within thirty days from date of purchase, that they will not be accepted if detached from the book and that they are not good for other than the holder who is required to sign on the cover. For several years the company did not enforce these rules and gross abuses of the tickets took place. It was found that storekeepers were buying books and reselling them at higher rates than set in the books, that gangs of men were buying books and distributing the tickets, and that various members of a family would use the same book. The company also issues ten-ride books at a slightly higher rate with no time limit and no condition against transference.

The order was accompanied by a change in color of the tickets so that the old tickets automatically became void on Jan. 31. On that date also the thirty-day limit on new tickets expired. There was considerable public opposition to the change. There has been no increase in fares on this line, the fares on fifty-ride books being as low as 1 cent a mile with transfers to Vancouver and New Westminister city lines free. Appeals were made to the Council of the municipality of Burnaby, but that body was unable to take any action as the company was within its contract rights.

Aldermen Don't Expect Lower Fare Propaganda Again

Having rejected the proposal for a lower fare appeal at a recent meeting by a vote of fifteen to five, members of the Board of Aldermen at Hartford, Conn., declare that they do not think the question will come before them again unless at the request of some representative organization such as the Chamber of Commerce. The desire was expressed that an appeal might be taken to the Public Utilities Commission, particularly for the purpose of impressing upon the commission the desirability of having the Hartford division of the Connecticut Company segregated as a fare unit.

The Hartford division is by far the best paying district served by the Connecticut Company as the company's report for 1921 shows. This report indicated that total receipts in Hartford in 1921 were more than $500,000 greater than the preceding year. The Public Utilities Commission has openly announced that large populace centers should not be obliged to pay for remote sections and that the trolley company's system should be divided into accounting districts, each district to comprise such territory and municipalities as are closely connected and are daily dependent in their industrial activities upon intercommunication and transportation.

Relieves Interurban Line From Old Franchise Rates

Negotiations with the village of London, Ohio, have resulted in an amendment to the franchise of The Indiana, Columbus & Eastern Traction Company, permitting substantial increases in rates between London, West Jefferson, Columbus and Springfield. This action was voluntary on the part of the Council of London.

The original franchise rates and the new rates are as follows:

	Single Trip		Round Trip	
From London to	Old	New	Old	New
Columbus	45c	70c	75c	$1.40
West Jefferson ..	20c	35c	35c	70c
Springfield	35c	55c	65c	$1.10

Chicago "L" Begins New Fast Service

Another step toward improving the Chicago elevated service has been accomplished by the Northwestern Elevated Railroad, Chicago. Beginning on Feb. 13, four trains will be operated during the evening rush hour from the loop, without stop, to Loyola station, a distance of approximately 9½ miles. Each of these four trains will be made up of eight cars, six cars having been the standard limit of train length heretofore, and in order to make this possible, it was necessary to lengthen the elevated platforms at the stations used by these trains. The improvement in service is greatly appreciated by the patrons living on the outskirts of Chicago and in Evanston and Wilmette.

These particular trains will be operated around the Loop, instead of coming through from the South Side, making the entire capacity available for northbound Loop passengers. Another innovation is a time card distributed among the elevated patrons. This time card gives the leaving times of these four trains from the various Loop stations. For example, these special trains leave State and Van Buren Streets, on the Loop, daily, at 5:08, 5:21, 5:34 and 5:45. The running time to Loyola Station from Clark and Lake, the last Loop stop, is twenty-eight minutes, giving a rate of speed of approximately 22 m.p.h.

Eight similar through trains southbound in the morning have been operated from Loyola to the first stop on the Loop, without stop, for several weeks past. The leaving times of these trains from the various stations north of Loyola have been given to the patrons. Up to the present time, however, only six-car trains have been operated in this special non-stop service. This service has reduced by five minutes the regular running time between the Loop and Loyola.

Increased Rates Start Bus Agitation

Since the recent increase in interurban fares was granted the Pacific Electric Railway Lines by the California State Railroad Commission, certain outlying suburban communities served by the Pacific Electric have agitated the establishment of municipal bus lines to compete with the interurban line. One of the most active communities in this direction is the suburban town of Glendale, which has a resident population of approximately 25,000, and lies just outside of the city limits of Los Angeles. The distance from the center of the city of Los Angeles to the center of the town of Glendale is 8.4 miles.

The Board of Trustees has started activities towards the establishment of a municipal-owned and operated bus line between its town and Los Angeles to compete with the Pacific Electric Line. It is proposed to submit to the voters there a plan to raise $125,000 to carry out the plan.

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Compromise Agreement Fails

City officials of San Antonio, Tex., have been blocked, at least temporarily, in their efforts to stop the operation of jitneys, in compliance with their compromise agreement with officials of the San Antonio Public Service Company. The agreement was that in return for a reduction of fares from 8 cents to 6 cents the city would eliminate jitney competition except to Camp Travis. An ordinance re-routing jitneys so that they would not come in competition with the traction company was drafted and passed by the City Commission, but a temporary injunction granted by Judge Minor of the Fifty-seventh District Court, on application of the jitney drivers, restrained the city from enforcing the re-routing ordinance. At the same time the officials of the traction company announced that they would not observe provisions of the fare ordinance that had been passed to take effect at the same time.

The result was that jitneys after Jan. 31, the date on which the ordinances were to have taken effect, continued to operate as usual and the traction company charged 8 cent fares as usual. Major W. B. Tuttle, general manager of the traction company, announced that his company would continue to charge an 8-cent fare until the city complied with its agreement and the anti-jitney ordinance or a jitney re-routing ordinance actually went into effect.

The city at first sought to prohibit the operation of jitneys outright, but were blocked in this move by the jitney men. Resort was then made to the re-routing ordinance.

Through Service Ends Controversy

Through service on the lines of the Dallas (Tex.) Railway to the Belmont and Vickery additions started Feb. 5. The beginning of through service marked the end of a controversy involving the residents of these two additions, the city officials and officials of the Dallas Railway for more than a year. Formerly a short independent line was operated by the Dallas Standard Traction Company, organized by the real estate firms that opened the two additions. When the additions were settled negotiations were opened for the Dallas Railway to take over the narrow-gage line and operate cars direct from the business district to the new additions. Legal entanglements followed and the matter was fought out in the courts before an agreement was finally reached by which the Dallas Railway took over the lines of the independent company.

Hears Petition for Straight 7-Cent Fare.—The petition of the Tidewater Power Company, Wilmington, N. C., for permission to charge a straight 7-cent fare has been heard by the corporation commission. The company charges 7 cents for straight fares in Wilmington, but sells four tickets for 25 cents or seventeen for $1. A straight 8-cent fare prevails in Raleigh on the company's lines.

"Buy in Indiana"

Interurban Roads Behind Movement to Divert Traffic to Indianapolis as Home Trading Center

The freight and express service offered by the interurban lines centering at Indianapolis, Ind., has probably done more than any other single agency to build up the commercial and jobbing interests of the city, and has been the means of greatly extending the territory from which the city draws trade. This has not always been accomplished simply by making available freight or express service, but through co-operation of the railways with merchants, and in some cases the pioneer work has been carried on by the electric lines themselves.

This was forcibly brought out, interurban officials say, by the party of 150 merchants, bankers and business men which came to Indianapolis a couple of weeks ago under the personal direction of J. C. Schade, general manager of the Winona Interurban Railroad, operating 70 miles of the line running north and south from Goshen to Peru, and connecting with the Union Traction lines at the latter point. A commercial and industrial survey made several months ago by Mr. Schade, covering the towns on his line, developed that merchants were buying their goods from jobbers and wholesalers in Chicago, Toledo, Cleveland, etc., and other cities, and that salesmen from those centers were visiting the territory regularly. Five East and West steam lines also serve this district, which probably largely accounts for their activities. It was also found that as a result banks were carrying 90 per cent of their exchange balances in those cities.

Towns on the Winona Interurban lines are approximately the same distance from Chicago as from Indianapolis, with the advantage in favor of the latter from the jobbers' or wholesalers' standpoint, due to the fact that overnight delivery of shipments is made via electric lines from Indianapolis, while deliveries from Chicago and other points mentioned take from two to five days.

As a result of this survey and its developments, a compaign of education was started in the towns on the line through Chambers of Commerce and other civic bodies, having as its slogan, "Buy in Indiana." The logic of this was quickly realized when it was made plain that several million dollars went from the State annually to promote business in other States, which might be better kept at home, particularly as the Indianapolis market offered equal or better values and inducements. Bankers also agreed to co-operate by increasing their balances in Indianapolis banks, and the trade excursion to promote acquaintance and friendship was the result. One town sent thirty representatives, one from each industry.

Judge Comments on Fare Situation

In a statement made recently by Judge J. T. Ronald of the Superior Court in Seattle, Wash., the opinion was expressed that if any citizen legally protests, no measure reducing the fare on the Seattle Municipal Railway below the present 8½-cent schedule can be carried out even if voted by the people at the polls. Judge Ronald emphasized, however, that his comments were those of a private citizen and were not made in an official capacity. Recently, in deciding the suit of the fourteen taxpayers to restrain the city from invading the general fund to pay for the railway lines, Judge Ronald held that the general fund might be drawn upon for operation only, but that such action could not be taken at this time because the tax levy for 1922 had been made. The judge made these two points:

1. Inasmuch as the city of Seattle already is levying taxes at a rate higher than that authorized by charter, any increase in the tax rate, whether for railway or other purposes, could be enjoined by application of one taxpayer.
2. That the city's undisputed testimony in the fourteen taxpayers' suit was that any reduction from the 8½-cent fare would force an invasion of the general fund in order to maintain the railway system.

For these reasons Judge Ronald said the city is facing a grave situation. He declared there is no doubt, if a lower fare is voted by the people, the City Council would immediately put it into effect. This, according to the testimony of the city's witnesses, would mean a deficit which could not be met if any taxpayer appealed to the courts. In his recent decision in the suit of the fourteen taxpayers, Judge Ronald held that inasmuch as the general fund levy is now beyond the limit prescribed by charter, no funds could be transferred from it for the aid of the railway or any other purpose.

Continuance of Higher Fare Refused

An 8-cent cash fare with books of twenty-five tickets at 6 cents a ticket will go into effect on the lines of the City Light & Traction Company, Sedalia, Mo., on March 1. This order was handed down by the Public Service Commission on Jan. 31.

Since August, 1921, the rate of fare has been 10 cents cash with a 6-cent ticket fare. This ruling was authorized for six months. A few days before the expiration of the 10-cent fare the company filed an application with the commission for a continuance of these rates.

The opinion of the commission states that the 10-cent rate is too high and is keeping the company from securing the business it is entitled to. The new order is for a period of thirteen months, and states that adult cash fares shall be 8 cents; children's cash fares 4 cents; two adult fares to be sold on the cars for 15 cents; or a token returned for a second fare, by a passenger paying 15 cents.

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Transportation News Notes

Ticket Plan Will Cut Fares.—The Salem & Pennsgrove Traction Company, Pennsgrove, N. J., will soon put into effect a strip ticket plan which will mean a slight reduction in fare for regular riders.

Interurban Wants Fare Provision Waived.—At Bucyrus, Ohio, the Crawford County Commissioners have been ask by F. H. Wilson, receiver of the Cleveland Southwestern & Columbus Railway, to annul the franchise granted in 1897, so that the road may apply to the authorities for an increase in passenger rates, understood to be 3 cents a mile.

Traffic Court Soon to Be Established.—According to a recent statement of Traffic Commissioner Marshall of Pittsburgh, Pa., a traffic court will be established shortly in the city. Mr. Marshall made this statement at a meeting of the Safe Drivers' Club in commenting on conditions in the city. Prominent city officials were present at the meeting and indorsed the program for safe driving.

45,493,064 Passengers Carried.—The Memphis (Tenn.) Street Railway during the year 1921 carried 45,493,064 revenue passengers. This number is 4,579,505 less than the estimate made by the company. Revenue for the year amounted to $3,181,245, which is $307,643 less than the estimated amount. The company reports a deficit of $90,584 for the year. A total of 7,590,981 car-miles was traveled during this period.

Seeks Restoration of Five-Cent Fare.—Mayor Curley in his inaugural address said that legislation for the restoration of the 5-cent fare for street car rides within the city limits will be sought at once. The unit fare at present is 10 cents, with some short hauls on the 5-cent basis. The Legislature is asked by him to cease "undue unwarranted an unwelcome interference with Boston in the conduct of its own business."

Southern Pacific Electrification Unlikely.—Julius Kruttschnitt, chairman of the board of directors of the Southern Pacific, stated recently that electrification of the lines of the Southern Pacific down the peninsula from San Francisco could not be planned at the present time. The electric lines in the district of San Francisco Bay have not paid operating expenses, he said, and the company was not expecting to extend its electric transportation services.

Improvement in Service Noted.—Improvement in the electric railway service and a decrease in the number of accidents have resulted on the lines of the Dallas (Tex.) Railway as a result of the new system of grading trainmen, according to George I. Plummer, superintendent of traffic. Trainmen are graded on attention to duty, courtesy, signals and care of cars. Carelessness in operating doors was the greatest cause for complaints during 1921, Mr. Plummer says. During December, nineteen collisions with automobiles were reported.

Reduce Fares 10 and 25 Per Cent.—Fares on the city lines in New Castle and Sharon, Pa., of the Pennsylvania-Ohio Electric Company were ordered to be 10 cents cash or eight tickets for 50 cents. This means a ticket reduction for most riders in New Castle of 10 per cent and for those in Sharon of 25 per cent, since tickets are now sold on the cars. The rate in New Castle was formerly 7 cents cash with few tickets sold at six for 40 cents. In Sharon the rate was 10 cents cash, with tickets at 8⅓ cents.

Hearing on Injunction Postponed.—Hearing of the injunction suit against the city of Louisville, Ky., preventing it from interfering with the Louisville Railway in collecting a 7-cent fare, was to have taken place on Feb. 8, but on Feb. 7 was postponed a week due to illness of attorneys for both the city and company. The case is before the Circuit Court of Appeals, Cincinnati, having been turned back to that court by the United States Supreme Court. However, it is doubtful whether it will be heard before some time in March.

Installs "Pay-Within" Cars.—The Birmingham Railway, Light & Power Company, Birmingham, Ala., has installed ten steel "pay-within" cars on its North and South Highland lines. The company recently put on a number of safety cars on its other lines. Passengers were informed of the change in manner of alighting from and boarding cars by means of car cards and newspaper advertisements. A full-page display in the daily paper carried pictures of the cars and the new type of entrance and exit.

8-Cent Token Buys Ride in Danbury.—Though cash fares remain at 10 cents on lines of the Danbury & Bethel Street Railway, Danbury, Conn., twenty-five tokens will be sold for $2. These tokens will be good at any time and for one continuous passage. The company previously sold 8-cent tickets in groups of twenty-five, but these were good only between 6 a.m. and 6 p.m. and within the city limits of Danbury. The tokens will include privilege of transfer. Judge Ives, receiver for the company, said that to return now to the 5-cent fare would be folly for that railway.

Will Support 10-Cent Rate.—The citizens' trolley committee of Pittsfield, Mass., has informed the Berkshire Street Railway that it will support the company in a plan to establish a flat 10-cent fare in place of the present zone system with a 6-cent charge in each zone, running to 18 cents in some instances for rides between different points in the city. A condition named by the committee is that the proposed rate be given a sixty days' trial. The Pittsfield-Dalton line, as well as those within the city of Pittsfield, is included in the proposal which may be put before the Public Utilities Commission.

Tokens in Readiness.—Approximately 80,000 tokens have been received at the offices of the Connecticut Company at Hartford, Conn., in readiness for the coming three-for-a-quarter schedule of fares that will go into effect on March 1. For all the cities in the State where the Connecticut Company operates 500,000 of the tokens will be distributed for sale. The tokens are being tied in lots of a dollar and larger amounts. No announcement is made as yet when the sale of the tokens will start, but it is probable that they will be ready for the public about a week before the new fare schedule goes into effect.

To Sell Tickets on all Cars.—For the convenience of the traveling public, the New Jersey & Pennsylvania Traction Company, Trenton, N. J., has been recommended by the State Board of Public Utility Commissioners to supply conductors on its Trenton-Princeton division with tickets selling at the rate of four for 30 cents. The utility board on Sept. 28 last permitted an 8-cent fare, with four tickets for 30 cents. The company, however, sold the tickets only at the terminus on West Hanover Street. The board says these tickets are for the benefit of the riding public and must be sold on cars. The order will become effective on Feb. 21.

Eat While You Fly.—A typical newsboy in white cap and uniform, the type that is found walking through the coaches of a fast Pullman train crying his wares for sale, which include magazines, books, candy, cigarettes, cigars, sandwiches and waffles, has been placed on the Wabash Valley Flyer by the Indiana Service Corporation which operates the fast interurban electric service between Lima, Ohio, Fort Wayne and Indianapolis, Ind. This extra service feature has been added for the particular convenience of travelers who leave Lima at 3 o'clock in the afternoon and arrive in Fort Wayne at 5:10 o'clock en route to Indianapolis. The wait at Fort Wayne is only ten minutes, which hardly allows time for passengers to get out and secure supper.

33,572,961 Passengers in New Jersey in January.—Under the provision of an order of the United States District Court in proceedings to establish valuation and rate of fare charged the Public Service Railway, Newark, N. J., has filed with the court a statement showing that 33,572,961 passengers were carried by the railway during the month of January. While this is below the figure for December, as was to be expected because of the holiday travel, it exceeds by 1,730,644 the number of passengers carried in November. For the first time since the new fare went into effect, a larger number of passengers used tokens, sold at four for 30 cents, than paid the 8-cent cash fare.

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Personal Mention

Mr. Rainsford's New Work Includes All the Engineering Arts

As Chief Engineer of the Philadelphia Company He Supervises Many Subsidiaries

Casting its weather-eye about for a man who ably combines all the special qualities of a trained engineer and the general qualities of efficient business man and organizer, the Philadelphia Company saw Ralph Rainsford and thereupon chose him for chief engineer. He thus holds a very important executive position with the company, which controls practically all of the public utilities of Pittsburgh and its surrounding territory, including the Duquesne Light Company, Equitable Gas Company and Pittsburgh Railways, and the

RALPH RAINSFORD

subsidiaries such as the Harwick Coal & Coke Company, Cheswick & Harmar Railroad, Equitable Auto Company, Equitable Sales Company, and Equitable Real Estate Company.

Mr. Rainsford, who has just assumed his new duties as chief engineer of the Philadelphia Company, is frank to admit that this post requires that its incumbent know a great deal more than is possible for one human being to know. He turns the trick, however, by having in his department specialists in each of the arts of engineering represented in the diffierent companies of the Philadelphia organization, and by being himself the hub of this information.

It is this centralizing sort of thing which Mr. Rainsford did during the war, when as Captain in the Signal Corps, Aviation Section, he was district manager of inspection for all material produced in the Atlantic states for the air service, Signal Corps, and miscellaneous departments including foreign missions. Since no organization existed to cover this work, Mr. Rainsford built one up, and prepared for training, housing and equipping the force, which constantly increased in size.

His position with the Philadelphia Company, and his work in the army are the culmination of excellent training and experience coupled with his unusual ability for efficient organization. Mr. Rainsford was graduated from Harvard University, in both the academic and scientific schools, in the class of 1902, possessing at the end of this training, he said, "honors in graduation, two degrees, a scholarship, much athletic experience, $100 and a railway ticket to Colorado."

EMPLOYED BY BANKING GROUP

During two years in the western states he gained practical experience as a laborer and foreman, then came to the attention of John Hays Hammond, at that time general manager for the Guggenheim Exploration Company. For four years thereafter he worked for these interests, including the American Smelting & Refining Company. Later he represented a New York banking group of wide interests and was engineer and manager of the company's properties in the West for six years. At the request of the company he was transferred to the General Motors Company, in which the concern was interested. He later joined the J. G. White organization as engineer, and after his service in the army returned to this company.

Leake Carraway Dead

Leake Carraway, formerly local director of public relations for the Virginia Railway & Power Company at Norfolk, Va., died on Feb. 10. Mr. Carraway went to Norfolk in June, 1919, from Charlotte, N. C., where he had been employed as executive secretary of the Chamber of Commerce and later as director of publicity of the Southern Public Utilities Company. Mr. Carraway was born forty-nine years ago at Wadesboro, N. C. He entered newspaper work in 1900 at Little Rock, Ark., as a reporter on the staff of the *Arkansas Democrat* and seven years later was appointed managing editor. He was also managing editor of the *Arkansas Gazette* at Little Rock.

In 1911 and 1912 Mr. Carraway was executive secretary of the Charlotte, N. C., Chamber of Commerce, resigning that position to serve with the Southern Public Utilities Company. He was known to public utility men the country over, having served as chairman of publicity men of the American Electric Railway Association, as chairman of the publicity committee of the Southern Gas Association and as a member of the managing committee of the advertising section of the American Gas Association.

George L. Radcliffe

More Than Thirty Years Spent by Mr. Radcliffe in Service of Cleveland Railway

Funeral services for George L. Radcliffe, vice-president and general manager of the Cleveland (Ohio) Railway, who died on Feb. 9, were held on Feb. 11, from the Epworth Euclid Memorial Church in Cleveland.

Mr. Radcliffe, who was fifty-two years old at the time of his death, had been engaged in electric railway work for thirty-three years. He worked his way up from the post of conductor to second in command of one of the largest traction companies in the United States. He was widely known to electric railway men in all parts of the country, having in addition to his position in Cleveland, held important traction posts in Detroit, Mich., and Schenectady and Utica, N. Y.

Mr. Radcliffe was born in Cleveland, May 25, 1869. He went to work for the old Broadway & Newburgh Street Railway in 1889 as conductor, after having been graduated from the grammar and high schools in Cleveland. Shortly

GEORGE L. RADCLIFFE

afterward he became cashier at the Aetna Road station of the company and upon the formation of the Cleveland Electric Railway in 1893 he was appointed general superintendent. In 1899 he resigned this position to identify himself with the Detroit United Railway.

Upon the resumption of the control of the Cleveland Railway by the Stanley-Andrews interests in 1902, he returned to Cleveland as general superintendent and remained in that capacity until 1908, when he went to the Schenectady lines as superintendent. In 1910 at the beginning of the operation of the Cleveland Company under the Tayler service-at-cost franchise, he again became general superintendent of the Cleveland lines.

In January, 1913, Mr. Radcliffe became general manager of the Cleveland traction company and on Dec. 23, 1916, he was elected vice-president and a director in the Cleveland Railway. He was identified with the Cleveland Railway in the three capacities—as vice-president, general manager and director—at the time of his death.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Recommends the Purchase of Light-Weight Cars

In replying to recommendations of Peter Witt made with respect to changes in the operation of the Seattle (Wash.) Municipal Railways, D. W. Henderson, general superintendent of the line, said that his department would recommend the purchasing by the city as soon as possible of at least 200 light weight double truck cars which should be built so as to be operated by one or two men as conditions require. Mr. Henderson said that his department believed that if the City Council and those who have the power could get in touch with some of the manufacturers of the country, possibly these cars could be purchased by paying a very small initial payment to start with and the balance could be paid from the net saving which there would be in the operation of these light weight cars. He said further that there would be a considerable saving of power, and considerable saving in the maintenance of equipment for the first five years at least, also a great saving in the maintenance of the track. These suggestions of Mr. Henderson have not yet been acted upon by the city utilities committee of the Council, to which they were referred.

$163,399 Profit for Brill in 1921

For the year 1921 the combined output of the four plants of the J. G. Brill Company amounted in sales value to $7,647,898. The combined output of the company's plants for each of the past six years follows: 1916, $6,180,895; 1917, $7,706,099; 1918, $16,761,154; 1919, $14,210,622; 1920, $17,537,293; 1921, $7,647,898.

After deducting from earnings the sum of $370,453 for depreciation and the cost of all maintenance and repairs for the year, and after charging against earnings and reserves, set aside for this purpose, the sum of $325,915 to cover depreciation in inventory values, the result, combined for the year, of the operation of all the plants shows a profit of $163,399.

It is explained by the company that while it has been doing business in Canada for many years, it seemed desirable to extend its operations in that territory, and for this purpose a new company was formed known as Canadian Brill Company, Ltd., all the stock of which is owned by the American company, except the directors' qualifying shares. The new company has leased, with an option to purchase, a moderate size plant at Preston, Ont., which was put in operation on Sept. 1, 1921, and now has sufficient work to keep it running at its full capacity.

Early in the year the company, jointly with the General Electric Company and the Westinghouse Electric & Manufacturing Company, organized the Electric Railway Equipment Securities Corporation, with an authorized capital of $1,000,000, all the stock, except directors' qualifying shares, being owned by these companies. The object in organizing this company was to provide a convenient means for disposing of car trust notes that the company considered advisable to take in partial payment for such cars as it desired to sell under a deferred payment plan. The Electric Railway Equipment Securities Corporation purchases from the Brill Company, without recourse, car trust notes which that company receives for cars, including electrical apparatus, sold under this plan, and either holds them or disposes of them to bankers to be sold to the public. It is explained that this financing company has been operating most successfully.

With respect to the future the company says that the business depression during the year is reflected in the decreased combined output of its plants, and while the company enters the year with a comparatively small amount of work on hand, there has been great improvement since the first of the year in inquiries received and in the prospects for business which should be placed during the current year.

The Break in the Crude Rubber Market

One of the outstanding developments of the last two weeks has been the phenomenal break in the crude rubber market. The price of spot smoked sheets dropped from 21 cents a pound to less than 16 cents. This is only 6 cents above the record low price of 1920 and is the lowest price quoted since last summer. Those familiar with the trade attribute the break to the forced selling by the large London interests. Furthermore the imports increased considerably toward the end of the year.

On Feb. 2 plantation first latex crêpe was quoted at 15½ cents and smoked rib sheets at 15¾ cents.

New Trade Directory

A new directory of firms whose trade touches either the United States, South America or Germany is to be issued shortly as Guia Aleman Americana by the Caxton Translations Institute of 47 Victoria Street, London, S. W. 1, England, and whose agents in New York are the Ford Corporation of 97 Broadway.

The directory will be in three languages, English, Spanish and German, and will embody 45,000 names of firms which have business dealings in any of the three countries. The three-language arrangement is so that the book will be equally useful whether the user speaks Spanish, German or English, and the descriptions on each page and in each section will be given in the three languages. A cross-index is to be included to give ready reference to the trade names of all the goods included in the directory.

57,000,000 Francs for Swiss Electrification

Fifty-seven million francs have been credited in the Swiss budget of 1922 for electrification of the Federal railways, according to a report to the Department of Commerce from Consul Haynes at Berne. Electrification of the Bellinzona-Lugano-Chiasso, the Erstfeld-Lucerne, and the Goldau-Zug lines will probably shortly be completed. The Amsteg power station, of 80,000 horsepower, will be ready to furnish energy about April, 1922, and the Lucerne-Zug-Zurich line will probably be electrified by the end of the year. The St. Gothard and the Sion-Lausanne line are to be electrified, and will be opened in the summer of 1923. The current will be supplied by the 60,000 hp. Barberine station, which by that time will have been completed.

E. B. Merriam to Direct Switchboard Engineering

E. B. Merriam, formerly director of industrial relations for the General Electric Company, Schenectady, N. Y., has been appointed executive engineer of the switchboard department for this company. As executive engineer he will direct and co-ordinate the engineering activities of the switchboard departments at Schenectady, Philadelphia and Baltimore. Mr. Merriam entered the employ of the General Electric Company in 1900 and for fourteen years was connected with the testing and switchboard engineering departments. About 1917 he became interested in employment problems and was appointed employment manager and director of industrial relations. During the war he served on various personnel classification committees and was industrial representative in military camps for determining occupational rating during demobilization.

Metal, Coal and Material Prices

Metals—New York	Feb. 14, 1922
Copper, electrolytic, cents per lb.	13.187
Copper wire base, cents per lb.	14.625
Lead, cents per lb.	4.70
Zinc, cents per lb.	4.83
Tin Straits, cents per lb.	31.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.775
Somerset mine run, Boston, net tons	1.875
Pittsburgh, mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	6.00
Weatherproof wire base, N. Y., cents per lb.	15.75
Cement, Chicago net prices, without bags	1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	84.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	90.00

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Rolling Stock

Dayton (Ohio) Street Railway has placed an order for fifteen single-end standard safety cars with the National Safety Car & Equipment Company of St. Louis Mo. The cars will be built at the plant of the Cincinnati Car Company, and will be equipped with two General Electric 264 motors and safety air equipment.

Los Angeles (Cal.) Railway has recently developed a new type of car designed for service on the lines of heaviest traffic. Twenty-five of these steel cars have been built by the St. Louis Car Company and furnished with the electrical equipment of the Westinghouse Electric & Manufacturing Company. The new cars are 48 ft. long, weigh 38,000 lb. completely equipped, and will seat fifty-two passengers. Westinghouse type HL multiple-unit control permits the operation of two or more motor cars in a single train. Two Westinghouse type 526-L motors are provided for each car. These motors are rated at 50 hp. each and have capacity and speed to maintain fast schedules. In addition to the motor equipment for the new cars, 150 type 526-L motors have been purchased to be used in retiring motors of obsolete types that have been in service in Los Angeles for many years and are no longer capable of carrying their full share of the burden in transportation service.

Track and Roadway

Chicoutimi, Que.—Plans are drawn for an electric railroad for the San Tonio Railroad. The cost is estimated at $125,000.

Wichita Falls (Tex.) Electric Company, in line with its plan to increase its capital stock, will make extensions and install new equipment.

Dallas (Tex.) Railway has available between $125,000 and $150,000 for extensions during 1922. The program includes the construction of a line on Lindsley Avenue and one on Haskell Avenue.

The Brooklyn (N. Y.) Surface Lines are contemplating an expenditure of about $1,500,000 on reconstruction of tracks this year. This will include work on the tracks of the Nassau Electric, the Brooklyn, Queens County & Suburban, the Coney Island & Brooklyn, and the Brooklyn City Railroad Companies. Prices are also to be taken on a large amount of special trackwork renewals for the season.

Eastern Texas Electric Company, Beaumont, Tex., is considering the extension of the interurban line that it now operates between Beaumont and Port Arthur, Tex., to Port Neches, a new town being developed in the Neches River midway between the two cities. Col. A. E. Humphreys, Texas oil man, who made a fortune in the Mexia oil field, will build a large refinery at Port Neches, and it is believed that the proposed expension of the interurban line to serve that port will be made.

The Municipal Railway of San Francisco, Cal., has 2½ miles of new track extensions under way. The Taraval Street line has 0.88 mile and the Masonic Avenue line 1.57 miles of double track. The Duboce Avenue route, recommended by the city engineer, will have approximately 4½ miles of double track, of which 4,200 ft. will be in tunnel. Decision as to route to be followed in the proposed Sunset and Ocean View extensions has not yet been reached.

Power Houses, Shops and Buildings

International Railway, Buffalo, N. Y., has acquired property on the Terrace and is altering the structure to provide terminals for the Buffalo-Lockport, Buffalo-Olcott, Buffalo-Niagara Falls, Buffalo - Lancaster - Depew Interurban lines. For years the International company has used downtown streets for parking interurban cars, but the new city administration has ordered the discontinuance of this practice.

Portland Railway, Light & Power Company, Portland, Ore., will shortly develop a hydro-electric power station at Oak Grove, which when finished will have two storage reservoirs with a combined capacity of 92,000 acre-ft. The plant will ultimately be developed to 80,000 hp.; 27,000 hp. will be completed the summer of 1924. The construction of the road to the proposed power house will be finished this year.

Interstate Public Service Company has begun the construction of a high-tension transmission system from Reddington, Ind., to North Vernon. It will be connected with the line that extends from Louisville to Indianapolis. The North Vernon Electric Light Company will buy electric power from the Interstate company. Another system is being built from Mineral Springs to Elizabethtown, in Bartholomew county, and will supply electric energy for many farm homes.

Trade Notes

Damon-Chapman Company, Rochester, N. Y., has announced that D. Baldwin Sanneman has joined its staff as general sales manager with headquarters in New York. Mr. Sanneman has been connected with the Perey Manufacturing Company for the past twelve years, and also was connected with the United Railways of Baltimore at one time.

H. A. Brinkerhoff, who for twenty-five years has held important engineering positions with Westinghouse, Church, Kerr & Company, and the succeeding company of Dwight P. Robinson & Company, has resigned. He will organize, in conjunction with R. W. Stovel, the consulting engineering firm of Stovel & Brinkerhoff. They will specialize on design, construction and equipment of electric power stations, factories and railroad shops. The offices of the firm will be at 136 Liberty Street, New York, N. Y.

A. B. Cole, for many years connected with the Westinghouse Electric & Manufacturing Company's publicity department, is now associated with the Wynkoop-Hallenbeck-Crawford Company. He will head the department of transportation publicity of this large printing house. The department writes literature to develop traffic of railway and steamship companies. The experience of Mr. Cole in transportation, industrial and international publicity will be valuable in this connection. His headquarters will be in New York.

Bemis Car Truck Company, Springfield, Mass., has appointed the Economy Electric Devices Company as its district representative in the states of Ohio, Indiana, Kentucky, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas and Nebraska. The very complete line of Bemis specialties includes case-hardened pins and bushings, wearing plates for bolsters and journal boxes, heat-treated motor bolts and manganese steel brakeshoe heads and center bearing plates.

New Advertising Literature

Electric Service Supplies Company, Philadelphia, Pa., is distributing bulletin No. 183 on lightning arresters. This contains sixty-two pages of material describing "Keystone" expulsion type and "Garton-Daniels" lightning arresters for central station, line, transformer, railway and mine protection.

E. P. Seymour Portable Rail Grinder Company has issued a new catalog descriptive of the Midget rail grinder. This contains information regarding details of construction, uses, instructions for operating and a detailed list of the spare parts.

Dwight P. Robinson & Company, Inc., has issued a folder giving a list with brief comments on design, construction and equipping of shops and industrial plants recently done by them. Several electric railway shops and manufacturers of equipment are included.

Quigley Furnace Specialties Company, 26 Cortlandt Street, New York. has compiled a new bulletin entitled "Hytempite in the Power Plant." In this bulletin information with illustrations is presented regarding refractory linings and the use of "Hytempite" in power plant work, as well as its uses in connection with "Carbosand" for baffles, patching boiler settings, etc. Some information is included on the uses of "Insulbrix," giving comparative heat losses of uninsulated and insulated walls.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Prepare Moderately for the Coal Strike

TRUE to expectations and true to its kind of thinking, the coal miners' union has ignored the counsel of its better leaders and recommended a nation-wide strike on April 1, if its terms of employment are not met. There is to be a referendum of the membership on the question, and while it may be too much to expect that the referendum vote will be against a strike, yet the demands for a six-hour day and a five-day week are so thoroughly out of line with the whole trend of the times that such a vote would be only common sense. These demands are certain to bring general public disapproval, and this must be obvious to the unions. One must then conclude that it is all done as the initial proffer in the old game of horse trading. Hence, while it is only the part of business prudence to increase the normal coal stock, there is no occasion now for electric railways to get "panicky" about placing coal orders.

Should the miners actually go on strike the editors of this paper will feel that there is a motive more impelling than that shown in the demands set forth. The reputation of the coal operators is such that one is inclined to inquire into the other side of the story. The fault may not all be with the miners. Conditions as regards both capital and labor have been very unsatisfactory in this field for so long that a strike now would probably be followed by prompt government intervention. It is known that the Department of Commerce has been working in this field for some time, though so far without apparent success, endeavoring to bring a peaceful solution.

The prospect thus seems to be this: A strike is not imminent now. If it actually takes place, it will not be of dangerously long duration, so far as part normal production is concerned. Meantime, there are large quantities of coal in storage. Finally, a strike may precipitate a very rigid government regulation of the industry.

"Safety Always" Means Just That

THE committee on safety work of the Transportation & Traffic Association plans this year a somewhat unusual program, the purpose being to attract greater interest in safety methods. It is somewhat strange that there should be any need in this direction. Unfortunately it is often most difficult to convince a man that he should do the obvious thing, provided it is something which he can put off until tomorrow, than to do something far less important if he has to do it immediately. This is true not only as regards individuals and companies but the public as a whole. They also need to be jarred into the necessity for safety work. Because of this, many companies have not done as much as they might in promoting safety. To overcome this inertia, the committee proposes to furnish the companies with new ideas by which they can attract the attention of the public and secure its co-operation. The committee also proposes to bring out the best ideas in regard to safety programs. May success attend its efforts.

The New York Valuation Discussion Has Now Begun

IT IS yet too early to comment on or criticise intelligently and in detail the valuation figures contained in the report to the New York Transit Commission by its Bureau of Valuation. It must be remembered that that is all these figures really are—a report to the commission by its own valuation force. But since this report will presumably have greater weight than any other one thing in the commission's final determination of value, it is worth while knowing exactly what these figures are and what they signify.

The "net valuation" which Mr. Madden and Mr. Lindars recommend as the desirable and equitable figure is called "original cost less the expenditures necessary to place the property in first-class operating condition." It should be pointed out that, according to Mr. Madden's testimony, this figure is not based on "original cost" but on an appraised value, using prices and possibly conditions so far as they could be ascertained, which were supposed to apply at the time the properties were constructed. That is to say, underground conduit lines built in 1898 or elevated railway structures built in 1880 were appraised at the figures for material and labor applying in those years, though the extent to which the conditions which surrounded or accompanied the construction of these systems received consideration is not apparent. It will be recalled that extensive underground structures had to be moved when the slot system was installed in the nineties; "air rights" had to be paid for by the elevated structures; other obstacles not now discoverable had to be taken care of as the exigencies of the times demanded. These all called for large expenditures, legitimately included in "original cost" but not possible to locate in an appraisal based only on June, 1921, inventories.

This, however, is not the only basis Mr. Madden considered. He has set up three "reproduction costs": one on the basis of prices applying at the time different portions of the railway were built or rolling stock bought; one on the basis of 1910 to 1914 prices or the "pre-war" period, and one on the basis of 1921 prices. Of these three bases of valuation, namely, "original prices," pre-war and present prices, Mr. Madden commends the first as the proper basis. But the public in general should not be misled by having an appraised value called "original cost."

It should not be inferred from the adoption of this method that actual original cost was discarded as undesirable—it was rejected because the original cost could not be ascertained—the records were gone. Therefore an effort was made to set up original cost by estimate. Mr. Madden testified that he compared his estimates

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with the company cost records when these were available, but at most these records merely "checked" his estimates.

Two or three other things are apparent in the valuation report. The final figure, while much lower than the capitalization—even greatly lower than the total of securities in the hands of the public—is not very far from the present market value of these securities so far as that value may be roughly determined. It is also worth noting that the announcement of these valuations had little effect on the Wall Street market. Some financial writers claim this proves that the public had already appraised the properties and that this indicates the valuations to be not far afield. On the other hand, the figures of Mr. Madden based on a 1921 price basis—a "present value" basis—less the expenditure to restore to first-class operating conditions, would make a value of approximately $700,000,000, as compared to the $465,000,000 recommended. Also there are many decisions against basing the final conclusion as to value upon original cost alone when present value is much higher, and it may be seriously questioned whether the $465,000,000 can be sustained as equitable, even if it were the original cost.

It does seem that Mr. Madden has stayed on thoroughly sound ground when he takes as his measure of depreciation that money which would have to be expended to place the properties in first-class operating condition. While showing what the straight line depreciation would be, he recommends the basis of judging depreciation solely on the basis of deterioration of service and not on any theoretical basis. Presumably if the properties were in first-class operating condition there would be no depreciation—which is sound economics. But even in counting this depreciation, the question arises as to whether the companies do not have an account against the city for that deterioration in service condition which has occurred since they first sought an adjustment in fare to allow them properly to maintain their properties.

But all these points and many others will probably be brought out at the hearings which will commence on March 6. The figures are before the companies, the city, the public and the commission for their examination and discussion. In what is certainly the greatest valuation in the electric railway industry, Mr. Madden and Mr. Lindars have produced a report for which they deserve sincere commendation. Figures for physical construction costs are so supported and accompanied by data and statistics that any one can easily learn how such figures were obtained and can agree or disagree in as great detail as he desires. Discussion will probably be more upon methods, upon the basis of choosing figures and facts, however, than upon detail.

In addition, it should be remembered that the commission is still to find and announce a valuation based on prospective earning capacity based on the franchise rates of fare. There is as yet no indication of what this figure will be. While Chairman McAneny has announced that it probably will not modify things much, nevertheless when it is finally prepared and announced it may prove to be more of a factor than is now anticipated.

Finally, it must be remembered that the decision of a commission in valuation procedure is, after all, a matter of judgment in which the general social good must be considered along with cold engineering, financial, economic and legal facts. The Transit Commission, in its activities so far, seems actuated by a desire to see that equity and justice are assured to all and that, above everything, the public will finally obtain a satisfactory transportation service at a fair price. If this principle is followed throughout the proceedings, no more can be asked. As the law stands, the companies may accept or reject the figures which the commission allows. It is earnestly hoped, now the valuation discussion has started, that all interested will lend a hand to help decide fairly this most difficult of questions.

Mischievous Comment Spread Before Employees

AS A USUAL thing leaders in union movements know a great deal more about economics and economic conditions than they receive credit for knowing. It is for this reason principally that statements made in the *Motorman and Conductor* for February challenge attention. A great deal of nonsense has of course been written about the poor widow and orphan as the holders of corporation securities, but the statement can hardly be allowed to go unchallenged which the *Motorman and Conductor* makes that "the stocks and bonds of security holders may become worthless without in the least inconveniencing them in the way of gaining a necessary livelihood." In the loss of return on the investment of the security holder the paper mentioned sees only the loss of the security holder's "speculative interest and not his life-sustaining interest."

The stockholder in a business is of course a partner in it. In becoming a partner he assumes all the risk that goes with ownership. Often the holder of stock in an enterprise was prompted to make his purchase by the hope of profit through enhancement of the value of his purchase. This is the worst, perhaps, that may be said for the stockholder. Estates, individuals and private corporations such as life insurance societies are, however, the principal purchasers of bonds. They are prompted in making such purchases by other motives than gain. Their thought is first for the safety of their principal and second for the assurance of their income returns. They are creditors; they are money lenders. Many individuals are among the purchasers of such securities. They buy them against the inevitable rainy day. And the rainy day of such investor is the day when his earning power has vanished either through sickness or superannuation, and he is as a last resort thrown back for support upon the income from his accumulations. Such purchasers take for the cash they lend to the issuing corporation the promise of that corporation to pay back the principal at a fixed date and in the meantime to pay the interest on the loan. The loss of either principal or interest is no less harmful to them than would be the failure of some friend of Motorman Jones or Conductor Smith to pay back to him a loan of $500 or $1,000. Moreover, sight is also lost entirely by the *Motorman and Conductor* of the fact that anything that reacts unfavorably upon a corporation necessarily reacts unfavorably upon its employees.

All this is elementary to the point, undoubtedly, of becoming disheartening in its recital to most people. The statements in the *Motorman and Conductor*, however, appear to make the reiteration of the facts necessary. Railway companies would do well to make the facts plain to their help so as to correct the erroneous ideas which are fostered by articles similar to the one from which the examples have just been quoted.

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What Do We Know About Steam Railroad Electrification?

SO MANY claims as to the benefits to be derived from electrification are made by its proponents and so many counter claims on behalf of the steam locomotive are put forward by those who seem to oppose the application of electric power on steam roads that some clear thinking is needed if the transportation industry is not to be unduly confused by the discussion. This thinking needs to be done not only by those who make the claims pro and con, but also by those who at present sit by and listen, often with some amusement. The last named group comprises, in general, those who control the expenditure of funds for the railroads.

In a matter so important and far reaching as this there will necessarily be much difference of expert opinion. But opinion alone will not prove the case, and it is fortunate that there exists a mass of data which need no agreement to make them valid and from which conclusions may be drawn. However, progress will be hampered until these data are formulated, and much electrification work will be done under present conditions that could be done better if the experts would get their heads together by a union of minds rather than by locking horns. Meanwhile the best that can be done is to give all possible publicity to such facts as can be secured and to point out what seem to be the most promising lines of development.

Much has been made of the relation of fuel conservation to electrification, and it is at this point, probably, where the greatest difference of opinion lies. And it is with this point that the public is most concerned, because the public wants the fuel reserve to last as long as possible. In a general way it ought to be possible to estimate the saving in coal which electrification would bring about. The present estimates differ so widely as to suggest that the estimators are reasoning from different premises. All agree that some fuel would be saved by electrification, but all do not concede that the saving will justify the cost in most cases. What is needed here is for the railroads that have had experience with electrified lines to furnish data which all will accept and then for the roads having comparable steam-operation conditions to supply data which will also be accepted as comparable.

But even when the railroads have agreed as to the possible fuel savings resulting from electrification they cannot be expected to adopt this means of saving unless they see either a financial profit in the change or an assurance of more reliable operation. The public can, of course, bring pressure to bear upon them, but this would not be just or in the best interests of the public unless the economics of the problem were given due recognition. With the government in control of the railroads the situation would be different, but this would be an unfortunate remedy, one many times worse than the disease. Under present conditions it is difficult to see just how a possible fuel saving is going to influence the railroads much, except where power, and especially water power, is extremely cheap and coal or oil suitable for use on locomotives correspondingly dear.

But after all fuel conservation is not the principal virtue of electrification in this country, although it appears to be so abroad. The principal virtue, in the opinion of the ELECTRIC RAILWAY JOURNAL, is placing at the disposal of the railroads a means of doing certain things which can be done by no other means. Fuel conservation is one of those big, broad questions upon which it is difficult to focus attention except in emergency. But there are acute problems of great variety which have to be faced and solved from time to time and in the solution of which electrification promises assistance.

To illustrate: Take first the case of a new line which must cross a range of mountains. The preferable route may be over the range at a high elevation. Here the possibility of regenerating power, a fascinating one to all railroaders, has the effect of virtually reducing the elevation and making a more direct crossing possible. Thus the Milwaukee climbs over the mountains which the Northern Pacific in part avoids by means of detours.

Closely connected with the above is the matter of grade climbing. Where a road is confronted with a mountain barrier necessitating tunnels, it can by the use of electric power pierce the mountains at higher levels and thus reduce the necessary tunnel length. This fact has been utilized particularly abroad and is a consideration in the proposed "piercing of the Vosges."

Probably the most pressing problem met by roads with growing traffic in normal times is to take care of the traffic and provide for future growth with minimum cost. Here is where electrification offers most. The term "the neck of the bottle" has come to suggest that part of a railroad system where traffic is held back by track congestion. Electric power helps to get the traffic through the neck of the bottle. The Lackawanna will soon illustrate this on its main line near Scranton, and the Norfolk & Western has been illustrating it for several years. The Pennsylvania, also, must have electric help in crossing the Alleghenies in the state of Pennsylvania and is experimenting with the most powerful locomotive in the world for this purpose. This railroad was confronted at the Philadelphia terminal, some years ago, with an alternative of getting more tracks over the Schuylkill River into Broad Street Station, or getting more service out of existing tracks. The obvious plan was to electrify, and this was done with eminently satisfactory results.

Still another thing that is possible through electrification and not otherwise is the bringing of railroads into the congested sections of large cities. The example for this was set by the Orleans Railway in France in 1900, when the tracks leading to its Quai d'Orsay station in Paris were electrified, and this success led the Pennsylvania to adopt the same plan for New York City, with results of world-wide fame.

The same principle applies in all tunnel and subway operation. Very early in the development of heavy electric traction numerous tunnel propositions were put through. They attracted passing notice and played their parts in the progress of the art but were soon forgotten except by the experts. Thus in 1894 the Baltimore & Ohio tunnel in Baltimore was equipped, and a few years later the Sarnia tunnel of the Grand Trunk, the Cascade tunnel of the Great Northern, the Detroit River tunnel of the Michigan Central, the Hoosac tunnel of the Boston & Maine and the Park Avenue tunnel of the New York Central in New York City. Each of these taught the railroad industry a lesson, the cumulative effect of which is now seen.

A splendid presentation of the great body of information on electrification now available will be made at the great International Railway Congress to be held in Rome within a few weeks. The papers to be read should be studied carefully by all who have the future of transportation in this country at heart.

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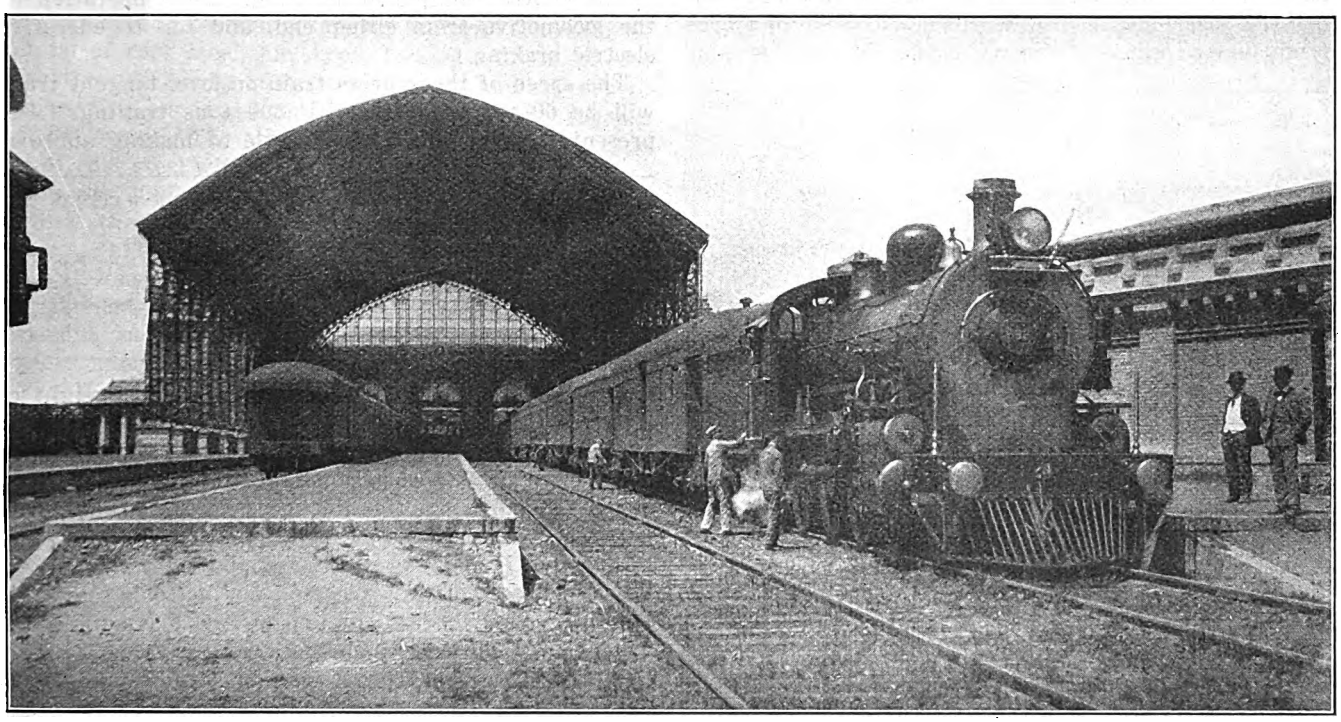
Passenger Locomotives for Chilean State Railways

Utilization of Experience with St. Paul and Paulista Locomotives and Interchangeability of Parts Were Features in Design of Passenger Locomotives for Chilean State Railways Electrification —Six Express-Type and Eleven Local-Type Locomotives Now Being Built



RAILWAY STATION AT MAPOCHO, SHOWING TYPE OF LOCOMOTIVE TO BE REPLACED BY ELECTRIC LOCOMOTIVE

THE passenger transportation requirements of the Santiago-Valparaiso-Los Andes section of the Chilean State Railways are most exacting in point of service to the traveling public. The necessity of maintaining unusually high-class service in this zone is due to the character of the passenger traffic being handled, not only between Santiago and Valparaiso but also in the local service from Valparaiso southward. In addition to being the largest cities of the nation, Santiago is the capital and Valparaiso the largest seaport, and therefore naturally a line connecting these two cities is required to provide first-class service. The schedules are rigidly maintained in both local and through service.

The general features of this electrification were covered in the issues of this paper for Dec. 3, 1921, page 991, and Jan. 28, 1922, page 151. The present article covers the passenger locomotives, but before they are taken up in detail some of the operating conditions which they must meet will be given.

Many of the Chilean railway executives have had training in the United States and as a result the present steam locomotives are maintained in line with the best standards in force in America today. In the past a number of the steam locomotives have been constructed in the Baron Shops at Valparaiso, while recently a number of engines have been reconstructed at these shops for passenger service.

Chile has in the past purchased most of her passenger cars in the United States, particularly those for the first-class service and for a large part of the second class service. The passenger cars are of United States standard design and compare with our medium-weight and light-weight cars. They are equipped with Westinghouse air-brake equipment and standard M. C. B. couplers. Each first-class car carries a 32-volt car-lighting outfit consisting of a generator belt-driven from the axle, a battery and a control panel.

The mild temperature conditions prevailing in this section of Chile make the use of steam-heating equipment for the cars unnecessary. This results in reduced weight and cost of the locomotives over what would otherwise have been necessary and in lower operation and maintenance costs as well.

Chair cars are carried by all express trains between Santiago and Valparaiso. Sleeping cars are not operated in this zone at present as the schedules are so arranged as to make this service unnecessary.

The through service between Santiago and Valparaiso is performed by fast express trains and omnibus, or way-passenger trains drawn by Baldwin and North British locomotives assisted by Borsig helpers on the maximum grade sections.

The express passenger trains normally carry six to ten cars in either direction or a trailing load of 200 to 300 short tons. Occasionally, these trains are made up of as many as sixteen cars for excursions, or by combining the regular trains with the trains for the accommodation of the Transandine traffic. The express passenger trains are made up for the accommodation of the first and second class service. They are the fastest trains, making only a few stops in the 116-mile run.

The omnibus trains make all stops between Valparaiso and Santiago. These trains are made up for the first,

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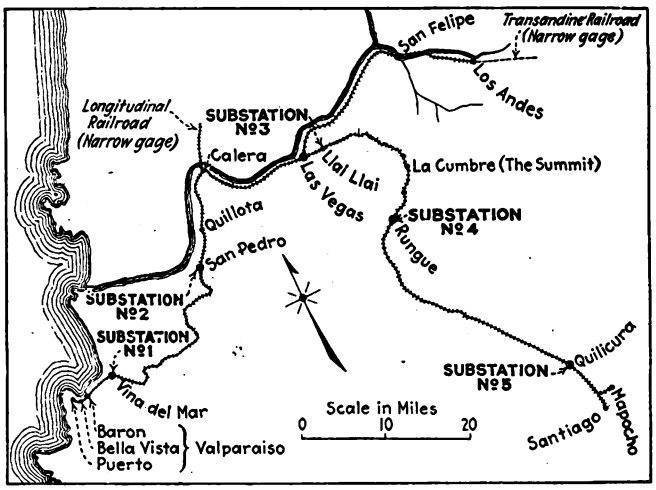
second and third class service and are the most heavily loaded trains. They usually carry from eight to ten, and frequently twelve cars per train. Helper engines are used on the heavy grade section between Llai Llai and La Cumbre, and occasionally on other sections of the line.

The transition from steam to electric motive power definitely eliminates all helper locomotives in connection with the passenger service, with the exception of trains of unusual weight. The heavy grades in the first zone



ELECTRIFICATION ZONE, CHILEAN STATE RAILWAYS

made it desirable to include the regenerative electric braking type of control on the passenger locomotives for the through service.

The local service in the first zone is between Puerto Station, Valparaiso, and intermediate points to Llai Llai, the latter point being 58 miles from Puerto. The most frequent service is between Puerto and El Salto, a run of 8 miles. Other trains run to Quilpue, Limache, Quillota, Calera and Llai Llai. A total of thirteen local trains will depart daily from Puerto under the electrification program and fifteen trains will arrive at this station. A number of the trains carry ten to twelve cars as far as Vina del Mar on the southbound run, dropping several at this point to be picked up on the return trip.

LOCOMOTIVES WILL HAVE REGENERATIVE BRAKING EQUIPMENT

The six Baldwin-Westinghouse electric locomotives which are being built for the express passenger service will be capable of hauling the 300-ton trailing load in either direction between Valparaiso and Santiago in less than the present schedule time with steam service. The present steam train makes a through run in three hours and forty minutes from Santiago to Valparaiso, while it is proposed to make the run with the electric locomotives in three hours and fifteen minutes in this direction or a reduction in running time of twenty-five minutes. In the opposite direction the steam service requires three hours and forty-five minutes, while the electric service will require three hours and twenty minutes or a similar reduction in running time. The electric locomotives are capable of making this run without the aid of helpers, whereas the steam locomotives require helpers on the maximum grade.

A photograph drawing of the express passenger locomotive as it will appear when completed is shown on page 313. An elevation drawing appears on page 312. These locomotives will have a rating of 2,250 hp. at a speed of 37 m.p.h. and a tractive effort of 23,400 lb. The locomotives will weigh 127 short tons, of which 105 short tons will be on the drivers. The wheel arrangement will be 2-6-0 + 0-6-2 consisting of two main trucks, each of which has three driving axles and a two-wheel guiding truck. The cab will be of the single-box type and the motors will be geared direct to the driving axles.

The control equipment is designed for operation of the locomotive from either end, and for regenerative electric braking.

The speed of the express train on level tangent track will be 60 to 62 m.p.h. with 300 tons trailing. The present steam engines are capable of making approxi-

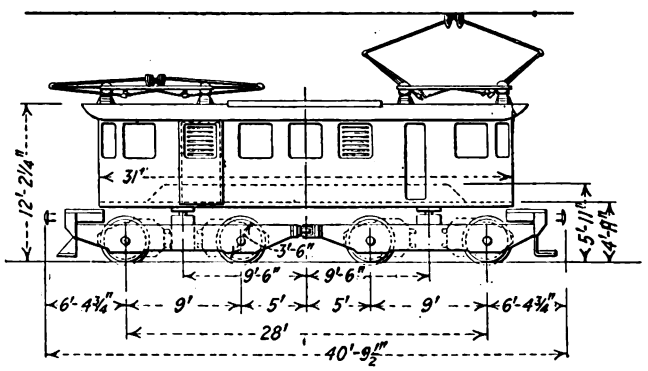
TABLE I—EXPRESS PASSENGER LOCOMOTIVE RATINGS

		Tractive Effort (Pounds)	Speed (M.p.h.)	Ventilation
For one hour	75° C. rise with full field.....	28,080	30.2	Natural
	with short field....	23,400	37.0	Natural
Continuous	65° C. rise with full field.....	20,700	33.8	Forced
	with short field....	16,080	43.5	Forced

mately 54 to 56 m.p.h., depending upon the weight of train. On the Tabon grade, which is 2.25 per cent, the average running speed with the electric locomotive will be 33.5 m.p.h. with a full tonnage train, while with the present steam locomotive the speed on this grade varies between 15 and 20 m.p.h., depending upon the trailing load. The time saving mentioned above for the express passenger locomotive is accomplished not only by higher running speed but by eliminating the delay in taking water, now necessary with the steam service.

The greatest saving in running time can be made with the omnibus trains. At the present time these trains make the through run from Valparaiso to Santiago in five hours and ten minutes, whereas with the electric service it is proposed to make the run in four hours and ten minutes, or a reduction in running time of one hour. The reduction in running time in the opposite direction will be approximately fifty minutes.

With 3,000 volts on the line the express passenger ratings will be as in Table I.



ELEVATION DRAWING OF LOCAL PASSENGER LOCOMOTIVES

The maximum tractive effort based on 25 per cent adhesion will be 52,500 lb. The maximum speed will be 62.6 m.p.h. The general dimensions and weights of the locomotive are shown in Table II.

The exceptionally low weight per driving axle, as shown in Table II, is considered to secure material advantage over the present steam locomotives as to track stresses.

One of the important mechanical features of these locomotives is that they will be equipped with M. C. B. couplers and with Continental spring buffers. These

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couplers will be provided with attachments for chain couplers adaptable for use with the Continental-type drawhooks as now used on the Chilean Railways freight cars. Eventually, however, all drawbar equipment on this system will be changed over to the M. C. B. standard.

The two trucks, each having three driving axles and one idler axle, will be connected at the inner ends by a drawbar held in tension by spring buffers. The frames will be of cast steel, bar type, located outside of the wheels, connected by cast steel bumpers and cross ties, and carried on semi-elliptic springs over the journal driving boxes. The wheels will be of the spoke type and of cast steel with rolled steel tires.

The cab underframe will be of rolled steel shapes running the full length of the cab and connected by cast-steel and rolled-steel cross members. The cab will be 38 ft. long, of the box type, arranged with an operating compartment in each end and an equipment compartment in the center for the control equipment, blowers, motor-generator set and air compressors.

The Westinghouse type 14-EL air brake equipment will be installed on all locomotives purchased on this contract. Straight air is available for handling the locomotives alone and the automatic feature for both locomotive and train. An advantage of this type is the possibility of application of locomotive brakes either independent of or in conjunction with the train brakes.

Electrical Equipment of the Six Locomotives

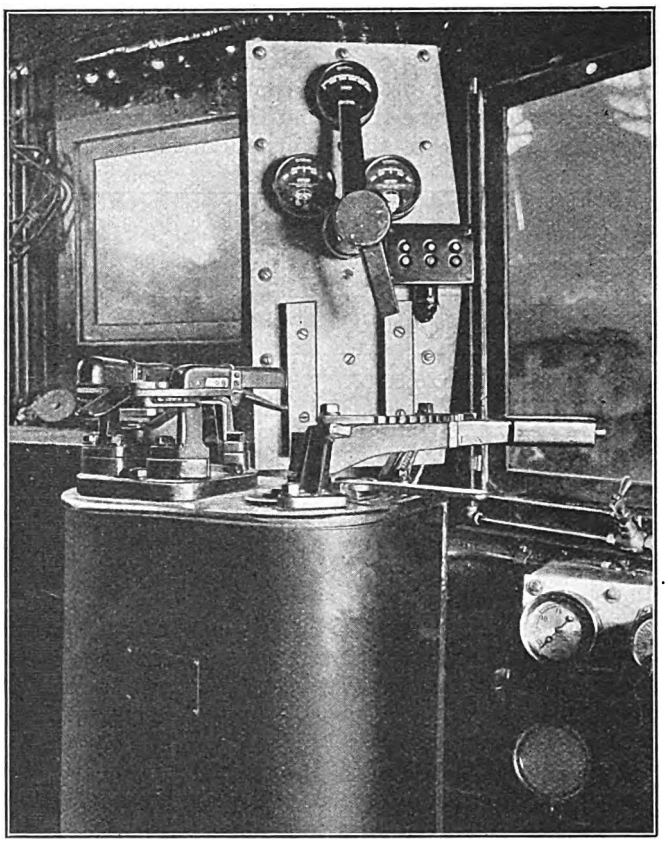
The express passenger locomotives will be equipped with six Westinghouse 375-hp. driving motors, with field control geared directly to the axles with Nuttall flexible spur gears. These motors are designed for operation two in series on 3,000 volts. This motor has a one-hour rating of 375 hp. at 210 amp. and 1,500 volts on short field.

The motors will be grouped in three speed combinations. On the lower speeds all six motors will be connected in series, giving one-third speed. For medium speeds, three motors will be connected in series with the two groups in parallel across the line, giving two-thirds speed. For full speed three groups, each with two motors in series, will operate at full line potential. There will be six running positions and the change from one motor combination to another will be made by the shunting method of transition which takes place with only a partial loss of tractive effort. This method also allows all motor fields to be connected next to ground, thus reducing their voltage stresses. At loads corresponding to the continuous ratings of the motor the running speeds for the several combinations are as follows: No. 1 with full field, 10 m.p.h.; No. 1 with short field, 13.4 m.p.h.; No. 2 with full field, 22 m.p.h.; No. 2 with short field, 28.2 m.p.h.; No. 3 with full field, 33.9 m.p.h.; No. 3 with short field, 43.5 m.p.h.

With any one set of motors cut out, 50 per cent of the locomotive capacity will be available for starting and 66 per cent for running. When the circuit to the main motor is opened, either through manipulation of the master controller or by operation of the overload relay, all of the main resistance will be inserted in the circuit before the final break of the line switches, thus very materially reducing the current to be interrupted and minimizing the consequent arcing at the contacts. This method of rupturing high voltage circuits has proved to be efficient and reliable and obviates the necessity for high-speed circuit breakers on the locomotives.

TABLE II—DIMENSIONS AND WEIGHTS OF EXPRESS PASSENGER LOCOMOTIVES

Classification	2-6-0 + 0-6-2
Length over buffers	57 ft. 4 in.
Length over cab	38 ft. 0 in.
Total wheelbase	48 ft. 4 in.
Rigid wheelbase	14 ft. 5 in.
Diameter of driving wheel	42 in.
Diameter of guiding wheel	30 in.
Weight of complete locomotive	253,600 lb.
Weight of mechanical parts	160,000 lb.
Weight of electrical parts	93,600 lb.
Weight per driving axle	35,000 lb.
Weight per guiding axle	21,800 lb.



CONTROL POSITION IN LOCOMOTIVE CAB, SHOWING MASTER CONTROLLER INSTALLED

The main motor armatures will be connected in the same combinations when regenerating as when motoring, the excitation for the motor fields during regeneration being supplied by a constant-voltage motor-generator set.

Equal distribution of the load between the motors is assured in this system of control because the same voltage is impressed on all fields, tending to give equal generated voltages. The stabilizing resistance is common to the main generated current and the exciting current and any tendency of one set of armatures to take a larger share of the current reduces the field current of that set and brings about the proper division of load. The stabilizing grids tend to equalize the resistance of the field circuits, which, with equal voltage, gives equal generated voltage. The range of speed in regenerative braking will be from 12½ to 50 m.p.h.

This method of regeneration permits utilizing to the fullest extent the entire weight on drivers. Heavier trains can be held on descending grades than would otherwise be possible and a much greater range of regenerative speeds is available to the operator.

There will be two master controllers. One in each end of the cab, and the same master controller will be

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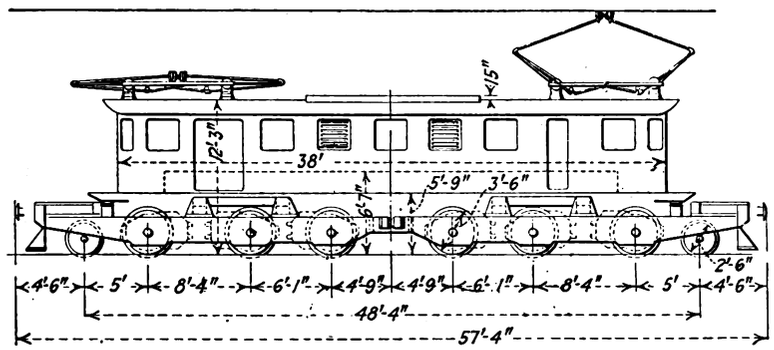
used for both motoring and regulating. This controller has four levers as follows: A reverse lever with forward and reverse position; a regenerative lever for adjusting regeneration; a motor combination lever having first, second and third positions, and a speed lever with sixteen resistance notches, one full field notch and one short field notch.

A total of fifty-one notches is available in the three combinations, so that the variation in tractive effort between notches is very small, thereby facilitating control. All levers of the master controller are interlocked.

Westinghouse type-HLF control establishes the main circuit connections by the use of individual unit switches



OUTLINE ELEVATION DRAWING OF EXPRESS PASSENGER LOCOMOTIVE FOR CHILEAN STATE RAILWAYS

operated by compressed air. The admission of air to and release from the switches is governed by electro-magnetic valves. Each switch will be a complete unit in itself and may be independently removed without disturbing adjacent switches.

For these locomotives it has been possible to construct a 3,000-volt unit switch of the same general design as that for standard low-voltage apparatus, using many stock details, but having ample insulation distances, and an improved form of magnetic blowout and arc box construction. Particular attention has been given to the use of uniform parts throughout all locomotives and to convenience for inspection.

Cam-operated switches will be used for certain combination switching and these will be operated by compressed air controlled by electro-magnetic valves. A number of switches will be mounted in a common frame within which are cams mounted on a single shaft. The shaft is connected through a rack-and-pinion to a double-end air engine. The proper application of air to the engine through electro-magnetic valves causes the cam shaft to be rotated, closing or opening the switches in proper sequence.

Each cam switch will be a complete unit in itself which can be removed from the group without disturbing the other switches. A switch is closed by the pressure of a cam on a hardened roller and opened by the action of a spring.

Motor-generator sets will supply low-voltage current for the control equipment, blowers and compressors. This is a two-bearing-type machine with a common frame for both motor and generator. The motor is a bipolar double-commutator machine and will operate direct from the 3,000-volt trolley. The normal rating of the set is 35 kw. at 95 volts, with 3,000 volts at the motor terminals.

A trolley disconnecting switch in one position connects the trolley to the main switch, and in the other position, with the pantograph down, locks it down and connects it to ground. The current collectors are spring-raised, air-lowered and mechanically locked in the lowered position and controlled throughout by compressed air. The double shoes are flexibly mounted and equipped with hard-drawn copper wearing strips, which can easily be replaced when necessary.

Two motor-driven blowers will furnish ventilating air for the main motors.

The meter equipment of these locomotives will include the following on each end: An ammeter indicating motoring or regenerating current per armature; an ammeter indicating field current motoring or regenerating per motor field; a voltmeter indicating line voltage; a duplex air gage indicating main and equalizing reservoir pressures, and a duplex air gage indicating locomotive cylinder and brake-pipe pressure.

ELEVEN ELECTRIC LOCOMOTIVES FOR LOCAL PASSENGER SERVICE

In their general appearance the eleven Baldwin-Westinghouse locomotives which will be furnished for local passenger service are somewhat similar to the express passenger locomotives. An elevation drawing is shown opposite. These locomotives will be capable of hauling a trailing load of 350 tons from Puerto to Vina del Mar and 260 tons from Vina del Mar to Llai Llai and return. Many of the local trains have ten and twelve cars on leaving Puerto, or a trailing weight of 275 to 350 tons. The margin in locomotive capacity over that required to haul 220 tons trailing, specified by the railroad, is very desirable and has been provided to meet the more severe service conditions which have developed. This locomotive will be capable of hauling a 300-ton trailing load from Las Vegas to Los Andes and return.

The local passenger locomotives will have a rating of 1,500 hp., corresponding to a tractive effort of 15,600 lb. at a speed of 37 m.p.h. The maximum tractive effort under starting conditions will be 40,000 lb. and the locomotive will be capable of operating at a maximum speed of 56 m.p.h. This locomotive will weigh 80 tons and the wheel arrangement will be 0-4-0 + 0-4-0, each truck having two driving axles. The cab will be of the single-box type and the motors will be geared direct to the driving axles.

TABLE III—LOCAL PASSENGER LOCOMOTIVE RATINGS

		Tractive Effort (Pounds)	Speed (M.p.h.)	Ventilation
For one hour	75° C. rise with full field.....	18,720	30.2	Natural
	short field....	15,600	37.0	Natural
Continuous	65° C. rise with full field.....	13,800	33.8	Forced
	short field....	10,720	43.5	Forced

The control equipment is designed for operation of the locomotive from either end. The grade conditions prevailing on the section of the line over which these locomotives will operate are not sufficiently severe to justify the use of regenerative electric braking, as the energy returned to the line would be small and the safety feature is not important.

On level, tangent track the local passenger locomotives will have a free running speed of 56 m.p.h. when hauling a 220-ton trailing load. On the section of line between San Pedro and Llai Llai the average running speed will be 45.3 m.p.h., southbound. The time thus saved will reduce the running time of the local trains

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between Puerto and El Salto by seven minutes northbound and three minutes southbound and between Puerto and Llai Llai by twenty-five minutes northbound and twenty-three minutes southbound.

With 3,000 volts on the line the locomotive ratings are as in Table III.

The maximum tractive effort based on 25 per cent adhesion will be 40,000 lb. and the maximum speed 56 m.p.h. The general dimensions and weights of the locomotive are shown in Table IV.

TABLE IV—DIMENSIONS AND WEIGHTS OF LOCAL PASSENGER LOCOMOTIVES

Classification	0-4-0 + 0-4-0
Length over buffers	40 ft. 9½ in.
Length over cab	31 ft. 0 in.
Total wheelbase	28 ft. 0 in.
Rigid wheelbase	9 ft. 0 in.
Diameter of driving wheel	42 in.
Weight of complete locomotive	160,000 lb.
Weight of mechanical parts	96,000 lb.
Weight of electrical equipment	64,000 lb.
Weight per driving axle	40,000 lb.

The two trucks, each having two driving axles, will be connected at the inner ends by an articulated coupling in the form of a Mallet hinge. The frames and wheels will be of the same type and construction as on the express passenger locomotives. The cab will be 31 ft. long and in all other respects similar to the express passenger locomotive cab. The couplers and brake equipment will also be the same.

ELECTRICAL EQUIPMENT OF THE "LOCALS"

The local passenger locomotives will be equipped with four Westinghouse 375-hp. driving motors, duplicates of those used on the express passenger locomotives and geared directly to the axle with Nuttall flexible spur gears. These motors, like those on the express passenger locomotives, are designed for operation two in series on 3,000 volts and have an hour rating of 375 hp. at 210 amp. and 1,500 volts on short field.

The control of these locomotives is arranged to obtain two separate combinations by connecting the motors in series and in parallel and additional speed variations are obtained by varying the fields of the motors. At loads corresponding to the continuous ratings of the motors the running speeds for the several combinations will be as follows: No. 1 with full field, 16.2 m.p.h.; No. 1 with short field, 21.1 m.p.h.; No. 2 with full field, 33.9 m.p.h.; No. 2 with short field, 43.5 m.p.h.

The changes from one motor combination to another will be made by the shunting method of transition as in the case of the control on the express passenger locomotives. There will be two master controllers, one in each end of the cab, each controller having two levers, namely, speed lever and reverse lever. Inasmuch as the local passenger locomotives are not arranged for regenerative control, the master controllers differ in that all speed variations are secured by the continuous movement of a single handle. A total of twenty-three notches is available in the two combinations so that the variation in tractive effort between notches is very small, thereby producing minimum stresses on the drawbar equipment. Both levers of the master controller will be thoroughly interlocked.

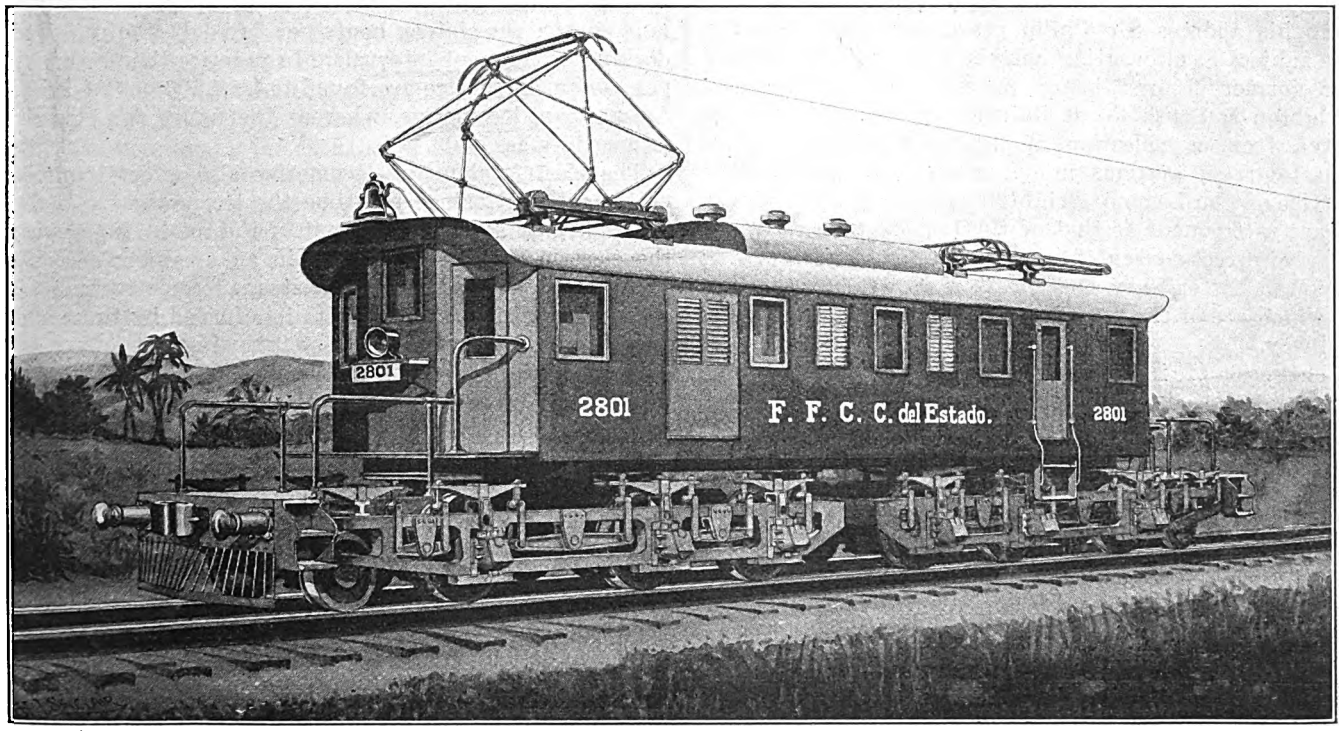
The high-voltage-switch and cam-switch units will be duplicates of those already described for the express locomotives.

The motor-generator set will be a double-armature machine, each armature consisting of a motor and a generator. The motors will be connected in series and will operate from 3,000 volts. The generators will be connected in parallel and will divide the load equally. The normal rating of the set will be 22.5 kw. at 95 volts with 3,000 volts at the motor terminals. This will supply current for the blower and compressor motor and for the control circuits.

The trolley disconnecting switch and the current collectors will be the same as those used on the express passenger locomotives and already described.

One motor-driven blower will furnish ventilating air for the main motors.

The meter equipment will be similar to that on the



EXPRESS PASSENGER LOCOMOTIVE FOR CHILEAN STATE RAILWAYS

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express passenger locomotives, without the ammeter indicating field current.

The following parts are interchangeable between express passenger and local passenger locomotives: Air-brake equipment, blowers, buffers, cab doors, windows and hardware, cam-operated switches, couplers, current collectors, draft gear, driving axles, driving boxes, driving brasses, driving tires, driving wheels, high-voltage switches, lightning arresters, low-voltage switches, miscellaneous control parts, motors, motor suspension, wearing gibs and shoes, wheel hub liners. This interchangeability of parts between locomotives will permit carrying small stocks of renewal parts, will facilitate maintenance of locomotives and keep down maintenance costs.

Electrification a Question of Financial Soundness

Economic Efficiency Determines the Practicability of Electrification and Choice of System—Figures Are Given for Steam and Electric Working on Several English Railways

THE sole criterion of the practicability of electrification is its financial soundness, was the point made by Sir Philip Dawson in an address recently delivered before a section of the Institution of Electrical Engineers of London, according to an abstract of his paper in the *Electrical Times*. The selection of a suitable system should be made from the broadest standpoint, due regard being paid to the conditions of service. For example, although a low-tension direct-current system requires many more substations than does an alternating-current system, Sir Philip said that this extra expenditure is justifiable where the trafic is of sufficient volume to keep each substation operating at a good load factor. At the request of the English Ministry of Transport some interesting data dealing with relative costs and weights were collected by careful investigation of actual working over a considerable period.

In his address Sir Philip presented comparisons on the subject of alternating current versus direct current, the former figures being provided by the London, Brighton & South Coast Railway, while the latter are taken from a collection of figures from the various direct-current systems in operation in England. The service on the London, Brighton & South Coast Railway is not as frequent as that of the London tube railways, but the direct-current figures include railways such as the Manchester-Bury and the L. & N. W., the services of which are of the same nature as that of the Brighton Railway.

The cost of installing a low-tension direct-current system today, including cables, substations, bonding, signaling, etc., is about £10,000 per mile of single track. In the extension of the Brighton Railway (alternating current) the corresponding outlay is only about £6,000. The cost of operating per car-mile for direct current varies from 4.5d. to 11.2d., the alternating current cost being 9.7d., with the same price assumed per high-tension unit. The same figures for operating costs per ton-mile are from 0.14d. to 0.297d. and 0.224d. respectively. These figures show that alternating current strikes the happy medium in operating cost, while the initial cost is substantially lower.

It is often stated that alternating-current equipment is much heavier than direct-current machinery developing the same power. The following figures show that this is not the case:

Railway	Weight of Electrical Equipment Per Cent of Total Weight	No. of Cars per Train (Average)
Liverpool & Southport	20	4.24
Manchester-Bury	27.3	3.91
L. & N. W.	18	5.2
L. & S. W.	19	4.5
Metropolitan	23	4.6
District	17.3	4.87
L., B. & S. C. R.	21	4.3

The London, Brighton & South Coast Railway has prepared from its records a comparison of the cost of working a system under steam and electric power. The figures are taken from experience, and are all agreed to by each department.

The cost of running, inclusive of maintenance of rolling stock, staffing, etc., per train-mile is as follows:

	Steam d.	Electric d.
Local passenger	50.51	27.58
Local goods	108.083	64.084
Through passenger	41.769	26.741
Through goods	66.054	52.028

In the above comparison the average coaches per train were 6.6 in the case of steam and 4.4 for electric trains. This does not invalidate the comparison, however, since it is not economical to run steam trains with less than six or seven coaches, whereas the fewer coaches making up an electric train the cheaper it is to run.

Perhaps the chief advantage of electric traction is the greater traffic capacity of the line. This is fully demonstrated by the following figures. The average suburban train speeds are 9.31 m.p.h. for steam and 21.8 in the case of electric trains. The seating capacities being 462 and 308 respectively, the seat-miles-per-hour figures are 4,300 and 6,714, thus showing a considerably greater carrying capacity with electric trains.

Again, an electric locomotive is advantageous from the maintenance point of view. A steam locomotive is in service for sixteen hours per day only and requires docking at frequent intervals. In practice the net hours per annum in service are found to be 4,800 out of 8,760 for a steam locomotive, whereas the figure for electric locomotives is 7,700.

The electric shunting locomotive also effects considerable economy, since the time the locomotive requires power is only about 28 per cent of the total. Moreover, the electric locomotive can attain an average speed of 5 m.p.h., as against 2.7 for a steam locomotive.

Confirmation of these results is afforded by those obtained on the St. Gothard line, showing the effect of electrification in speeding up the service. The maximum gradient to be surmounted is 2.5 per cent. The times taken for the journey are as follows:

	Southward Journey Steam, Minutes	Southward Journey Electric, Minutes	Northward Journey Steam, Minutes	Northward Journey Electric, Minutes
Through passenger	55	34	80	50
Stopping passenger	70	45	122	76
Through freight	90	50	130	80

It will be seen from these data that, for the class of service considered, electrification has very material advantages, and that, apart from the increase in carrying capacity of the line, the running cost, if the scheme is properly organized, is considerably lower than with steam working.

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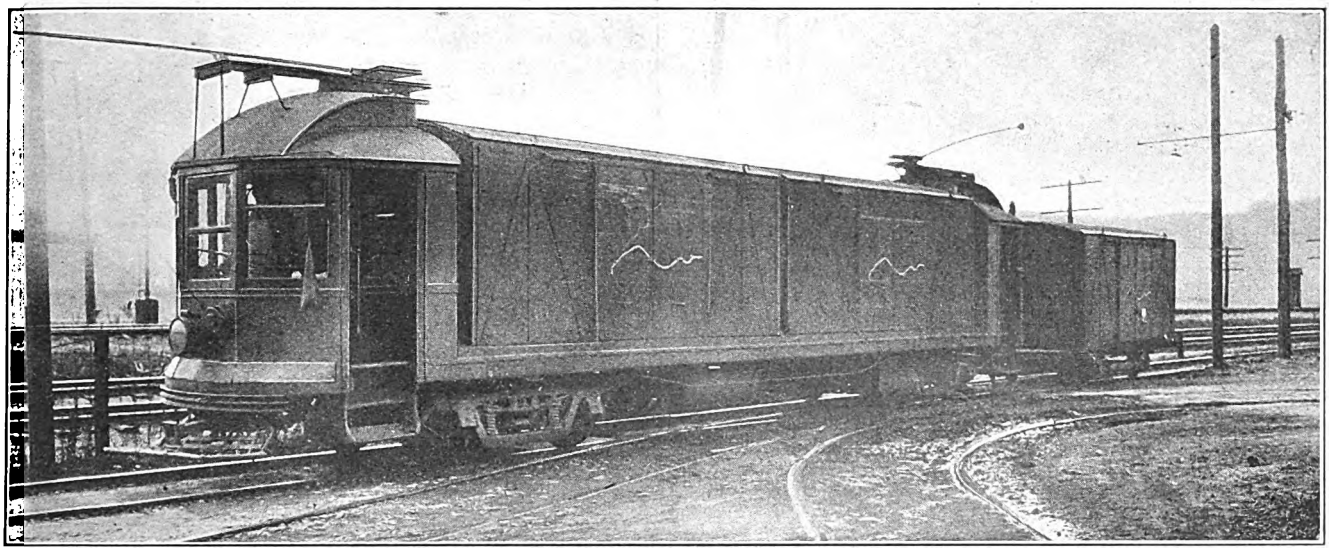


TROLLEY CAR WITH TWO CONTAINERS AND TRAILER WITH ONE CONTAINER ARRIVING AT ANDERSON'S FERRY FREIGHT STATION, WHERE CONTAINERS WILL BE TAKEN BY MOTOR TRUCK TO CINCINNATI

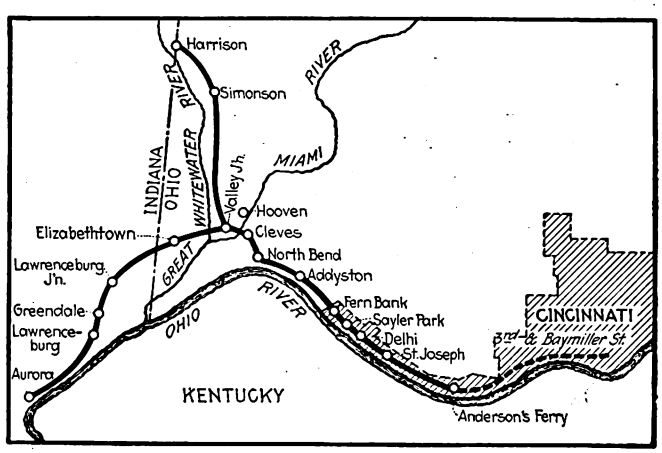
Containers Carry Freight in Cincinnati

An Interurban Electric Railway Without Tracks Downtown Gives Through Freight Service by Containers Which Are Carried on Motor Trucks Within the City and on Electric Cars for the Interurban Run

THE latest company in Cincinnati to establish a freight container system is the Cincinnati, Lawrenceburg & Aurora Street Railroad. The equipment includes a small, inexpensive off-track freight station downtown in Cincinnati, an automobile transfer system between this station and the company's track terminus some distance from the center of the city, and a set of containers and motor trucks. The motor truck equipment and service is furnished by the Cincinnati Motor Terminals Company, utilizing the same system employed by that company in the interchange of less-than-carload freight between the twenty-eight main stations and sub-stations of all the railroads entering Cincinnati. Until the introduction of this system, the Cincinnati, Lawrenceburg & Aurora had handled no freight, being handicapped by the fact that it is of standard gage and its lines terminate at an outlying point known as Anderson's Ferry, where passengers transfer to the broad-gage lines of the Cincinnati Street Railway to reach the center of the city. However, the plan is being considered to extend the company's tracks to the new Dixie Passenger Terminal at Fourth and Walnut Streets, Cincinnati. Some particulars of this freight container system were published in the issue of this paper for Nov. 26, 1921, but additional information now available will be given.

The off-track downtown freight station is at Third and Baymiller Streets, in the central originating zone of Cincinnati. This freight station is equipped with a simple superstructure, carrying an electric hoist for handling the demountable containers. Here freight is received from and delivered to shippers. It is conveyed between this station and the Anderson's Ferry rail transfer station in containers carried by truck. At the transfer station the containers are mechanically interchanged between the motor truck and an electric flat car by an electric hoist also carried on a superstructure. The electric flat car has a capacity for carrying two containers, each of 5 tons capacity, and hauls a trailer carrying one container.

From Anderson's Ferry, as shown in the accompanying map, sixteen rail destinations are reached in a territory previously served largely by long-distance motor trucking and by steam-line l.c.l. and partial river transportation. With the new service, freight received at the Cincinnati downtown station at noon is delivered



MAP OF CINCINNATI, LAWRENCEBURG & AURORA STREET RAILWAY

at the end of the line, 30 miles distant, at 3 p.m. at rates to shippers identical with interstate steam-line freight rates and, of course, in much shorter time.

Freight received from shippers' trucks and drays at the off-track downtown station platform is run into containers by hand truck through end doors and is stowed in line station order to facilitate quick side-door unloading of the individual consignments at the various rail destinations. Lading and way bills are made out at the receiving station for each consignment, and an abstract of the shipments in each container is made out from way bills. The truck driver of the terminals

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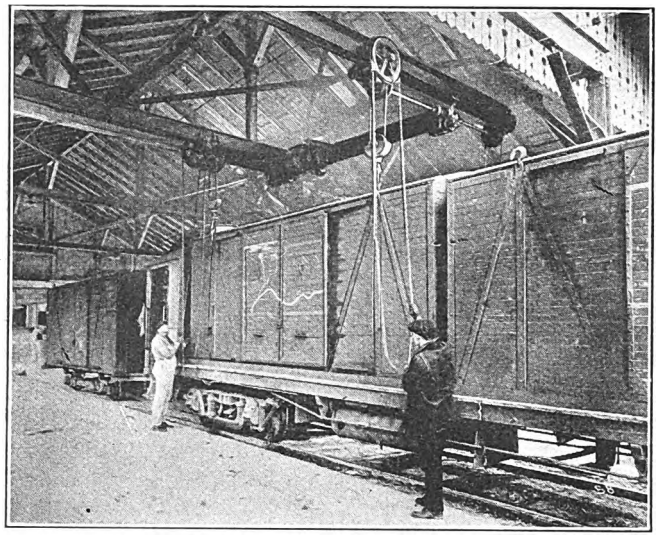
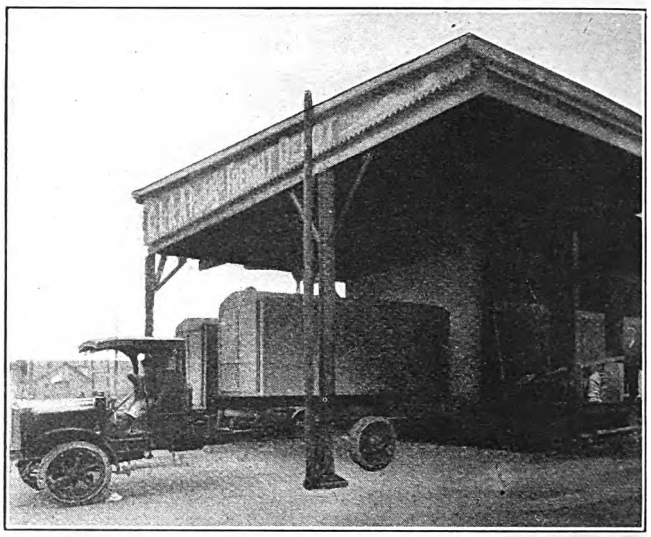


THE CONTAINERS ARE LIFTED EASILY BY TWO MEN THROUGH THE USE OF OVERHEAD ELECTRIC TRAVELING CRANES



THE CONTAINERS LEAVE THE DOWNTOWN TERMINAL AT 12 O'CLOCK SHARP AND ARE HOISTED BY CRANE ONTO THE MOTOR TRUCK

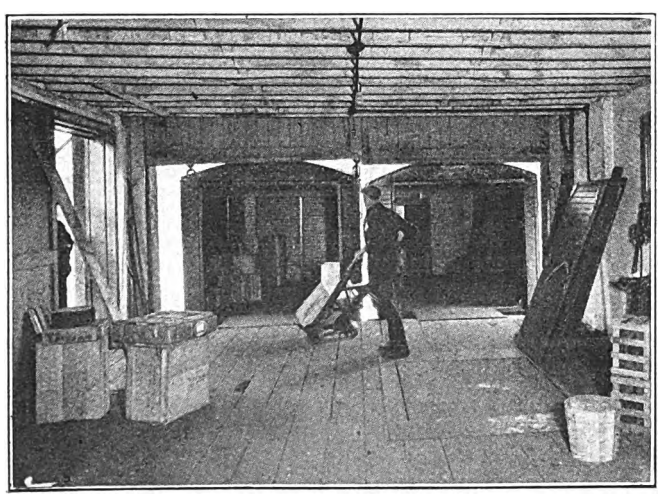
company receipts for the container load, as represented by the abstract, of which he takes two copies, together with the corresponding way bills, to the rail transfer station. He retains one receipted copy of the abstract when his load is delivered at this outside station. All freight carried in containers by the terminals company is under the railroad's seal.

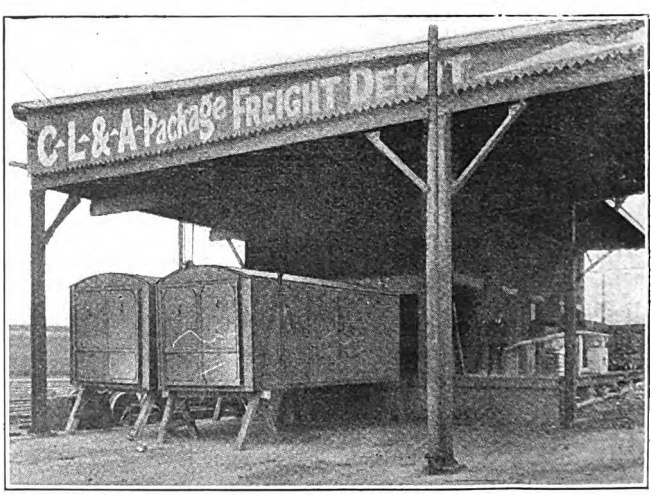
While the service is growing, it was started such a short time ago that at present the freight each way needs usually but two of the three containers provided. The usual routine followed with these containers is as follows: Two truck chassis arrive at the downtown station at 11:55 a.m. on regular schedule and pick up the two containers which have been loaded there, one with outgoing freight for the main line and one with outgoing freight for the Harrison branch. After these containers are loaded on the motor trucks they leave the downtown station at 12 o'clock noon. At 12:40 these trucks arrive at the transfer station, where the demountable containers are exchanged for incoming return-load containers which have arrived on the flat car and trailer. The distance between the Third and Baymiller Streets station and the Anderson's Ferry station is 6.1 miles through 1½ miles of city traffic and over a curving route, reaching an elevation of about 175 ft.

Before the trucks arrive at the rail transfer, the two-man crew of the container train has already mechanically unloaded the incoming containers from the flat car and placed them on wooden horses, awaiting the arrival of the trucks. When they come, the train crew loads the outbound containers from the truck to flat car or trailer and then transfers the return containers from the horses to the trucks. Five minutes per container is allowed for these two mechanical interchange movements, and the trucks are due back at the downtown station with their return load at 1:30 p.m. The chassis are then released for use at the Cincinnati steam line freight interchange service at 1:35. The containers returned to the downtown station are set on horses under the superstructure roof adjacent to the inside station platform. The return load freight is hand-trucked from the containers to the station platform, awaiting consignees' call. Space is provided for three bodies or containers, so that one is always available for outbound loading by hand truck from shippers' trucks or drays.

TRAIN OPERATION IS BY TWO MEN

The container train is operated by a crew consisting of motorman and conductor. This two-man crew handles the containers by hoist at the rail-motor-truck-transfer station at Anderson's Ferry and unloads the freight from the containers at the various line destina-





DURING THE MORNING THESE CONTAINERS ARE LOADED WITH FREIGHT AT THE DOWNTOWN FREIGHT STATION OF THE C., L & A. RAILROAD. LATER TO BE TAKEN 6 MILES BY MOTOR TRUCK AND TRANSFERRED TO THE ELECTRIC CAR

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tions. The crew also makes store-door deliveries and collections of light consignments to and from shippers adjacent to rails. If, as at present is usually the case, there is one container of freight for Aurora and one for Harrison, the second container on the motor flat car starts from Anderson's Ferry as an empty, but is used to receive volume commodities at local way points. Thus one container functions on the main division for outbound unloading and the other container for inbound reloading.

At Valley Junction the trailer is dropped off for haul over the Harrison branch by a passenger car, and the self-driven container car proceeds to Aurora. Both Harrison and Aurora, Ind., at the end of the line, are reached before 3 p.m. for delivery of freight received at the Cincinnati downtown station before 12 noon. On the return trip, the crew loads freight from way station platforms into the side doors of the containers, without the necessity of considering station order, since all consignments are segregated upon receipt at the station in the Cincinnati downtown business district.

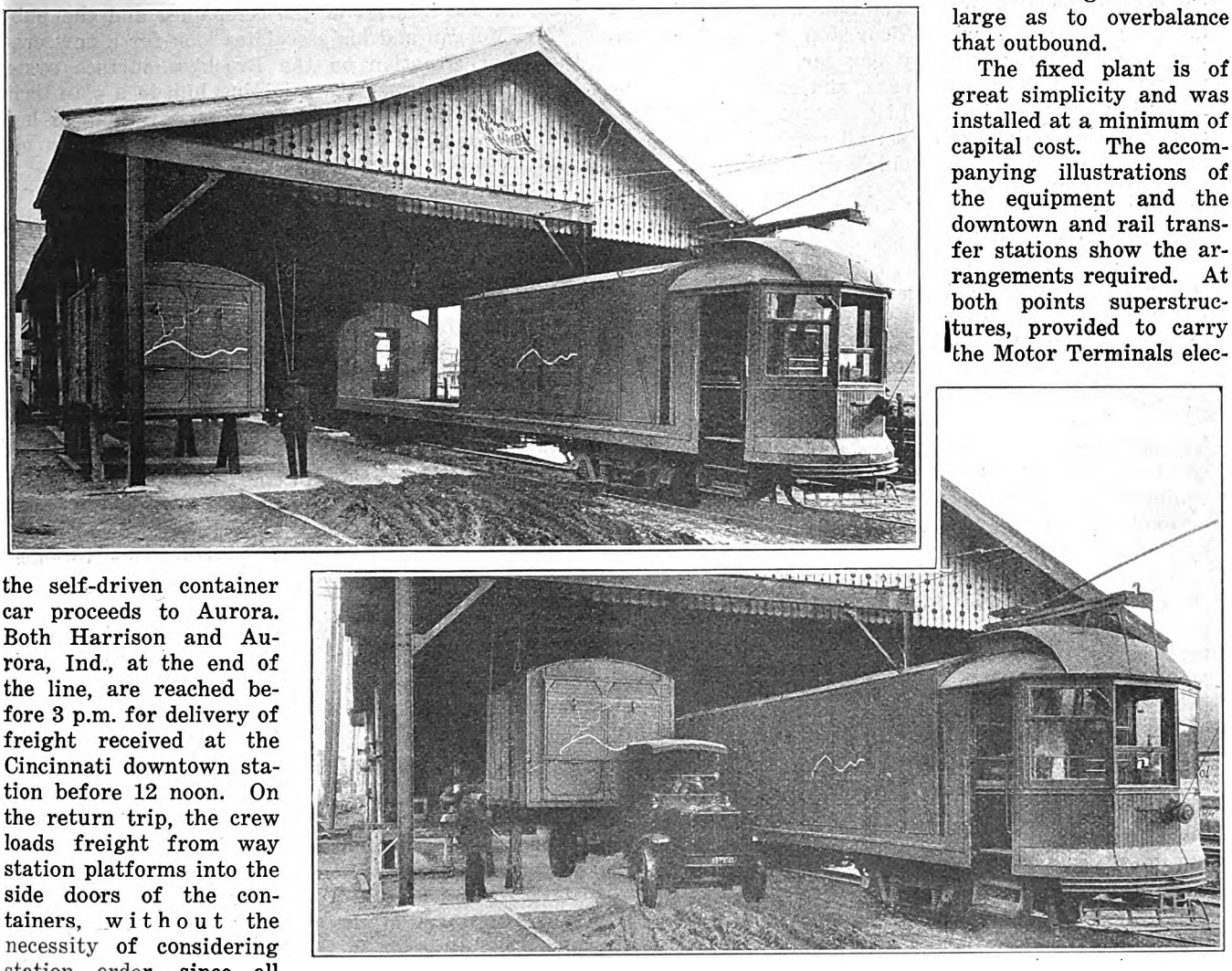
In addition to the regular run of business, retail dealers along the line are using the service to secure emergency shipments from Cincinnati wholesalers and jobbers to cover shortages for special customers' calls. The procedure is as follows:

The dealer telephones his requirements to the nearest line way station, from which it is relayed by the railroad's private wire to the Cincinnati station. The agent here transmits the call to the wholesaler, who delivers the consignment to the downtown station. Thus a shipment requested by a retailer at the end of the line before 11 a.m. will reach him before 3 p.m. the same day. This special service is now in daily use.

Since the inauguration of the service on Aug. 17, 1921, both outbound and inbound business has increased rapidly. By Jan. 10, 1922, a sustained daily average of 9,000 lb. outbound had been reached, in addition to fluctuating inbound agricultural commodity movements of from 1,000 lb. to 12,000 lb. Records for recent typical days are given in the accompanying table. It is expected that by spring or midsummer the amount of inbound freight will be so large as to overbalance that outbound.

	Inbound	Outbound	Total
Jan. 24	9,030 lb.	4,592 lb.	13,622 lb.
Jan 25	13,100 lb.	8,759 lb.	21,859 lb.
Feb. 1	1,700 lb.	11,569 lb.	13,269 lb.

The fixed plant is of great simplicity and was installed at a minimum of capital cost. The accompanying illustrations of the equipment and the downtown and rail transfer stations show the arrangements required. At both points superstructures, provided to carry the Motor Terminals electric hoists, are of standard I-beams and channel sections with 10-in. channels, serving both as beams and rails for hoists.



THESE VIEWS ILLUSTRATE HOW A CONTAINER IS LIFTED OFF THE ELECTRIC CAR AND SET ON HORSES AND HOW IT IS LATER LIFTED FROM THE HORSES ONTO THE MOTOR TRUCK

The outside platform at the downtown station has an area of 382½ sq.ft. and the inside platform of 748½ sq.ft., exclusive of the small office at the rear. This floor area is extended to 1,028½ sq.ft. by the addition of 280 sq.ft. provided by floor area of two bodies. It is estimated by the Cincinnati Motor Terminals Company that this fixed plant is capable of passing 160 tons of freight per eight-hour shift, so that considerable expansion of the business is possible with present facilities.

A similar superstructure was built at the rail transfer station except that channel trolley rails extend over the loading track. It was necessary only to raise the

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roof of the old passenger shed slightly, and it was possible to do this without any interference to the structure or service.

ROLLING STOCK

The mobile equipment consists of two 5-ton truck chassis employed only one hour and thirty-five minutes a day, six bodies or unit containers and a flat car and trailer. The truck and containers are of the same standard as those employed in Cincinnati for steam-line l.c.l. interchange service, except that the bodies are provided with sliding side doors. For this purpose angles are extended back from the doors at the top and bottom on the side of the container, and the door is divided at the center with a door stop arrangement similar to that in the ordinary box car. This alteration was made at minimum expense, and required only the flattening of the rivets which secure the steel side straps of the containers to permit perfectly free movement of the doors. The containers measure 17 ft. 6 in. long, 8 ft. wide and 7 ft. 3½ in. high, inside dimensions.

The electrically driven container flat car has a controller and trolley at both ends. An old passenger car that would otherwise have been scrapped was remodeled for this purpose, at a total cost of approximately $500, by removing the body and cutting the side sills in the middle and splicing them to extend the length about 3 ft. to provide platform length for two containers. Steel angles 3 in. x 3 in. are secured to the floor of the car, laterally and longitudinally, to hold the containers securely. The car is 59½ ft. over all in length and is equipped with four motors. The trail car consists of a simple steel frame 20 ft. long, to carry one container on a single truck.

It has been pointed out by B. F. Fitch, president of the Motor Terminals Company, that the next logical extension of the service would be the establishment of farmers' off-track stations near or on the line. Such platform stations would serve as receiving and assembly points of farm products and also as delivery points for unit-load consignments of shipments destined to rural districts. If away from the line the containers could be hauled to the nearest rail stations by motor trucks. It is emphasized that such practice would tend directly to improve highway maintenance conditions by removing in so far as possible long-distance trucking from the highways, as the loaded unit-containers would be hauled by rail the maximum possible distance.

The rates charged to shippers for the freight service described average about 45 cents per 100 lb., according to distance and commodity classifications, and are identical with steam-line rates—for a service that has proved faster than express. The motor truck service, containers and hoists used are leased to the Cincinnati, Lawrenceburg & Aurora Railroad by the Cincinnati Motor Terminals Company.

Trolley Bus Pictures Reversed

IN TWO views of trolley buses on page 233 of the issue of Feb. 11 the captions became transposed in the printing office. Actually the view on the left showed the trolley bus built by the St. Louis Car Company and equipped with Westinghouse motors and foot control. That on the right illustrated the Packard automobile chassis with Kuhlman body and the same type of motors and control.

Manager Talks to Men

Brooklyn City Officials Address Employees at Series of Meetings on Means of Securing Better Operating Efficiency

CLINTON E. MORGAN, general manager Brooklyn City Railroad, at a series of day and night mass meetings, is addressing the 7,000 surface line workers in an effort to humanize the electric railway industry there. The men of both the Brooklyn City and the Brooklyn Rapid Transit organizations are being assembled at the various carhouses and Mr. Morgan is urging close co-operation between management and labor in the interest of the companies and the public.

Mr. Morgan and his associates look for a new era in the labor situation on the Brooklyn surface system. Heads of departments are joining him in a plan to link the executive offices more closely with the power house and the carhouse. Dozens of speeches have been made and the response has been immediate and emphatic.

The Brooklyn surface lines are operated as a unit under H. Hobart Porter as vice-president. Concrete advantages in improved morale are being reflected in fewer accidents and quicker service. One of the biggest things to be achieved is the cutting down of the number of accidents, which, it was revealed, are using up 5 per cent of the surface line receipts. Fewer complaints are being received than formerly was the case, and they are outweighed by the number of commendatory letters and messages—a practically unprecedented condition in the Brooklyn railways.

William Siebert, superintendent of surface transportation and a veteran of many years in Brooklyn traction service, is aiding Mr. Morgan. Others who are taking part in the campaign are the division superintendents and the executive staffs of the Brooklyn City and the Brooklyn Rapid Transit.

The meetings are being held at the various depots, though often there is a joint assemblage from two depots at one meeting.

DEVELOPMENT OF PERSONAL RESPONSIBILITY SOUGHT

Personal responsibility is being stressed by Mr. Morgan and his associates. He is continually urging the men on the cars to take an active individual interest in the daily task of providing adequate surface transportation. The methods now being applied by Mr. Morgan in Brooklyn are similar to ones which proved very successful in their application to lines operated under his direction in the Middle West, particularly in Michigan and Indiana. He is confident of the outcome of their use in Brooklyn.

Mr. Morgan declared that this was not a sporadic effort designed to relieve the temporary condition, but a matter of fixed policy. He saw no reason why the army of Brooklyn surface workers could not be welded into an organization 100 per cent effective in the interests of the vast community which it serves. He also looks upon his work as one of a progressive series of elements which will eventually make for a solution of the vexatious traction difficulties of New York. Mr. Morgan said:

> The situation when I came to Brooklyn a little more than two years ago was a good deal like a wake. Our railroad property was almost dead. It was as a corpse laid out and we did not know whether to put a sheet on it and bury it or try to bring it to life again. Some of the limbs of this tree became decayed and Receiver Garrison had to clip them off because the trunk could not carry

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the load. Fortunately, the sun is going to shine behind this cloud before very long. Through co-operation we will all take hold of the wheel, whether it has a little mud on it or not, and hang on until we roll the whole thing over.

The job of the whole surface line organization, Mr. Morgan emphasizes, is to sell transportation, which he characterizes as "the business of moving a person or a commodity between two points in the shortest possible time with safety and comfort." Every man in the organization, he added, is a salesman. Courtesy and control of the temper are things which, he said, the management would insist upon. Comments on the need for good service follow:

We must give service, rain or shine, twenty-four hours a day and 365 days in the year, because that is what the millions of the riding public have a right to expect of us. We are the servants of the public. We are classed exceptionally as a public utility and it is up to us to render the service because this public is paying for it.

Training Men Receives Greater Attention

Greater care is being taken to break in new men on the Brooklyn surface system. In the old days, it was said, the training was not such as to promote efficiency or co-operation. Now, great pains are being taken to teach the newcomer every essential of the operation of a car. Avoidance of delays is being urged by Mr. Morgan on the motormen. Mr. Morgan's message to his men is:

Motormen can do a whole lot to improve the service. Watch the people on the street and try to stop for them so that there will be less delay. Do not try to hit all the mud holes, but when you make a stop do not run up against the rock of Gibraltar. Let us make decent stops. Do not annoy passengers. They don't like to have the backs of their necks snapped off.

Dealing with taxes, Mr. Morgan cited figures to show the difficulty encountered by the electric railway, because of their relative inability to pass the increase on to the consumer. Taxes on the electric railways, he said, are almost 18 per cent of the gross receipts. Paving takes 4½ to 5 per cent more. In explaining this matter to the men Mr. Morgan said:

You pay the franchise tax; you pay $20 a year for every car you run in addition to other taxes, and when the state legislative investigators got into this thing they found that big industrial plants pay only about 4½ per cent of their gross earnings and some of them made real money during the war; yet the electric railway pays from 15 to 18 per cent and further must pay an income tax on gross earnings no matter whether you have spent it or not.

Every day in the year except Sunday the Brooklyn surface lines carry more than 1,000,000 passengers. Stressing the need of vigilance, Mr. Morgan quoted a report of Superintendent Siebert which said that on a foggy day recently, when the rails were bad, only eleven wagons were struck by cars. During the next day, although it was clear, forty wagons were hit. The reason for this, Mr. Morgan explained, was the state of mind of the motorman. Records show that in lower Fulton Street, in lower Broadway and at the Brooklyn and Williamsburg Bridges, points of heavy traffic congestion, there are very few accidents. This is because the men know they must be careful.

Both Mr. Morgan and Mr. Siebert are cautioning the men against the influence of old and discredited aphorisms which have long been a part of the surface worker's stock of tradition. "Nobody is a motorman until he hits a wagon or a car," was pointed out as a trite saying that is full of danger. Both Mr. Morgan and Mr. Siebert reminded the men that it costs money to hit the wagons. Five per cent of the receipts of the Brooklyn surface lines are paid out for accidents, they told the men, and added that if the company had to pay out from its gross receipts only 2 or 2½ per cent through accidents, "would there not be a chance for you to get some of it?"

Joining Railway Lines in French Vosges Region

Conditions Following the Peace Treaty Render Desirable the Connecting of Alsace-Lorraine with the French Territory to the West—Only a Meager Connection Is Available Now

BEFORE the war strategic conditions interfered with the junction of the railway lines in the Vosges Mountains on the French and Alsatian borders. A recent issue of *Le Génie Civil* explains that outside of the main lines connecting Paris, Nancy and Strasbourg to the north of the mountains, and Paris, Belfort, Mulhouse and Bale, to the south, there was no direct connection between the short lines of the eastern system which stopped at Fraize, Gérardmer, Cornimont, Dussang, on the one hand, and those of the Alsace-Lorraine system which stopped at Saales, Sainte-Marie-aux-Mines, Lapoutroie, Metzeral, Lautend Krut and Sewen. A convenient arrangement for tourists, but one without commercial importance, was, however, established through the Schlucht Pass by two tramways, respectively, from Gérardmer to Schlucht and from Schlucht to Munster, which met at the frontier. Soon after the war the desirability of making several junctions between these railway lines was recognized, and schemes were evolved which have been called, rather inaccurately, "piercing the Vosges." This could only be done literally by means of great tunnels comparable with those of the Alps. The easiest of these junctions, that from Sainte-Die to the Saales-Schirmeck-Strasbourg lines, which descend the valley of the Bruche, was quickly decided upon. This work is now reported to be well along.

RAILWAY LINES IN VOSGES REGION, ALSACE-LORRAINE BORDER

Key: Heavy dotted line, tramways connecting across border, Gérardmer to Schlucht and Schlucht to Munster.
Double dash line, lines authorized by the law of March, 1920.
Light dotted line, projected lines.

There are many other plans under consideration. A mass meeting to consider some of them was held at Colmar in September, 1921. This "Colmar Congress" supported the simultaneous construction of two lines, Saint-Die-Sainte-Marie and Cornimont-Metzeral, to cost about 35,000,000 francs. The plan is to utilize the fact that electrification, which permits the use of steeper grades than steam operation, will provide for the crossing of the Vosges at high altitude. This will reduce the necessity for constructing long tunnels and consequently will be much less expensive.

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Electric Railway Publicity

Devoted to How to Tell the Story

Does Publicity Produce Results?

By E. F. Kelley
Secretary Kentucky Association of Public Utilities and Editor of the *News Service Bulletin*

THE question "Does Publicity Produce Results?" has been passed back and forth a good many times in the past few years, following the inauguration of various state committees on public utility information. A local operator of public utilities walked into my office a few days ago and observing that the *News Service Bulletin* of the Kentucky Committee on Public Utility Information was in course of preparation remarked:

Do you really think that sort of publicity produces results? Does it really get your story where you want it to go? Do you really labor under the delusion that the busy editor of any fair sized newspaper is going to take the time to read that over, to say nothing of taking valuable space in his news columns to publish any portion of it?

My only answer to the gentleman was to pass across the desk the following from the Louisville *Evening Times* of Jan. 19, 1922, which appeared in the editorial columns under the caption, "Public Utilities":

Several interesting thoughts are carried by the news bulletin of the Kentucky Committee on Public Utility Information. On the subject of publicity for the affairs of corporations serving the people, James P. Barnes, president of the Louisville Railway, speaks clearly and with emphasis. He would have the customers taken into the confidence of the merchants of service.

The old spirit of the public-be-damned has gone flickering as the discovery has become general among business men that the people are able to take a considerate interest in the welfare of business agencies supplying them with transportation or light or fuel. The unreasonableness sometimes displayed by the public in dealing with corporations was largely due to misunderstanding. It was supposed that the profits were immense and that nothing but niggardliness prevented infinite improvement in accommodation.

Public ownership of public utilities is advocated in a quotation from Roger W. Babson, the statistician, but it is customer ownership through purchase and not government ownership by vote that he favors. The modern tendency in big business is to distribute holdings to as great an extent as possible. The man who buys transportation will be much more amenable to reason if he has a dividend interest. It was said of old that the possession of a dollar made a capitalist and the ownership of a share of stock would convert a socialist. This is exaggeration, perhaps, but the point is evident enough.

If a man has a share in an enterprise he can be fairer in his judgment concerning outlay. He will take the trouble to inform himself as to income and expense and will not insist upon impossibilities.

I had a bully time with him and he left the office sold on the thought that "publicity most assuredly does produce results."

It has long been a feeling among certain utility operators, and perhaps justly so, that the only time the name of their company could be brought before the public in the local press was when a serious accident had occurred or there is something to criticise and condemn. There is a certain news value to a great many features of public utility operation that the newspapers appreciate and are anxious to pass on to their readers, but which we in our everyday routine consider commonplace and uninteresting—yea, oftentimes a nuisance. This fact was quite forcibly brought to my mind several years ago, while in conversation with some newspaper men.

On this occasion I was a member of a party of newspaper men seated around the dinner table. I was then with a road at Schenectady. Conversation began to lag and while sparring for time I remarked that I had learned of a rather unusual trait in one of our motormen that day, one whom I never believed had a single thought for any one but himself.

I then told the story of a motorman who while operating an interurban car between two stations observed a woman struggling and battling her way across a field in the face of a raging blizzard. As the car approached, the woman dropped to the ground from sheer exhaustion. The motorman ran into the field, picked the woman up and brought her to the next town and into the hospital. The woman's life was no doubt saved by quick thinking on the part of the motorman.

The newspaper men exclaimed in a chorus, "Why didn't you tell me about that when I was talking with you yesterday? That's the great trouble with you fellows, the only way we can get any information out of you is to tell you we've got the story and you might just as well tell us all there is to it." That was in 1915, and since that time they have always had "all there was to it" from our office. Of course, it was given with certain reservations from publicity, but they received "all there was to it." The request for reservation has always been honored and the confidence reposed in giving "all there was to it" never violated.

Make your newspaper correspondent your confident. Tell him "all there is to it" and tell it yourself; don't delegate the office boy to do it for you. Personal contact with the head of the company instills a certain confidence and gives more weight to the story than passing it to the newspaper man through a subordinate.

I believe you will agree with me when I say that the majority of the American people are on the right side of any question after they have an opportunity to study the question and have been properly informed. Your best medium for placing the facts before your people rests in your local press. Use it. You don't necessarily need a high-priced news writer, with the cleverness to conceal advertising features in his story. The news writers are just as wise as your company news writer. They will publish your story if it has a news value, but if you want to put across advertising, you will have to deal with the advertising manager, not the editorial room. Perhaps that is why it seems impossible to get the local paper to publish anything except accidents, criticism or condemnation.

Our committee on public utility information feels satisfied in the light of the editorial quoted above, and because of the comment from other newspapers throughout the State of Kentucky, that all newspapers are willing to co-operate with public utilities in placing their problems before the public, if their story is furnished

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in a brief, frank and a concise manner, and again, minus propaganda.

The *News Service Bulletin* now has a circulation of more than 900 copies. It is issued on the first and fifteenth of each month. Two hundred and fifty of these bulletins go to Kentucky newspapers, the balance of the circulation going to railway, telephone, light, heat and power companies and public officers, from the Governor and his staff down to the Aldermen and Councilmen of each community. Even the members of the State House of Representatives and the State Senate are on the mailing list.

Our committee firmly believes that considerable progress will be made in smoothing the misunderstandings at present existing between public utility operators and their respective communities if the thought is kept foremost in every utility operator's mind that utility problems have a real news value and that the editors are anxious and willing to receive the utility operator's story.

The old spirit of "the newspapers-be-damned" flickered out along with the spirit of "the public-be-damned" and the wise utility operator of today no longer slams the door in the face of the newspaper man and sends word out by the office boy that "he ain't in" but lays down the "welcome" doormat, extends the glad hand and proceeds to "tell him the whole story."

Encouraging the Sale of Metal Tokens in Dallas

TO ENCOURAGE the use of metal tokens in payment of fare on the lines of the Dallas (Tex.) Railway conductors on the lines of that company are now giving two metal tokens in change to every patron who tenders a coin larger than a dime in payment for fare on boarding a car, unless the patron makes special request for all change in return for his coin. Few patrons ask full change, but accept the two tokens, using one to pay the present fare and saving the other for a return trip or for use on some future occasion. The conductors on the various lines are given credit for the number of metal tokens they sell or the number registered by their fare boxes, and a campaign is on to see which conductor makes the best record in the use of metal tokens.

FORM OF ADVERTISEMENT USED IN METAL TOKEN PUBLICITY

The use of these tokens by the riders of the street cars serves to speed up traffic, as the token, or piece, represents 6 cents, and can be handled with much more dispatch. If a patron tenders a large coin and waits for change the line of passengers boarding the car is held up and traffic delayed.

The Dallas Railway is employing its publicity forces to encourage the use of metal tokens.

"No Accident Week" Successful

A "NO ACCIDENT WEEK" conducted in Los Angeles, Cal., by the local chapter of the National Safety Council, Dec. 4 to 10, 1921, proved successful in reducing injuries and in educating the public to the need of safety first. "No Accident Week" produced 334

CAR PLACARDED WITH "NO ACCIDENT WEEK" SIGN

general street car accidents, an increase of fifty-one over the previous week, which was attributable to the steadily increasing traffic preceding Christmas. Despite the increase in total of general accidents, there was a marked reduction in the number of injury accidents. A total of 104 persons were injured to some extent in electric railway accidents between Nov. 27 and Dec. 3, but during the campaign there were only eighty-one listed. There were no serious accidents in "No Accident Week" and there were only three in the week prior to "No Accident Week."

Future of Electric Railways Well Assured, Milwaukee Railway Says

"FEAR NOT" is the advice from the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., in answer to a remark credited to a city official that "the street railways are a lot of junk" and by the prediction also credited to him that the motor bus will put the street car out of business.

To prove that the official's statement was not 100 per cent accurate and to calm the fears of the subscribers to the 8 per cent preferred stock of the company an interesting advertisement entitled "Street Car Service Is Indispensable" has been appearing in the Milwaukee papers. In championing the railway the "ad" says that next to the city water system the railway is the most vital of all public services to the life of the community. It carries more than 200,000,000 yearly and has a physical value of more than $23,000,000. Despite the fact that the company has not been permitted to earn a fair return it has earned enough money to meet all of its obligations and to pay a small dividend to its common shareholders, who have been required by state regulation to take much less than a fair return during the past year upon their investment.

In summing up the usefulness of the railway the company announces that, in view of its twenty-six year record of leadership, it will make use of all betterments that are developed. Further, that it will pay 8 per cent on every dollar invested, and it invites the public to buy some shares of the $1,200,000 remaining of the $3,000,000 stock offering.

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Railway Helps Clean City

After Blizzard Baltimore Company Hauls Accumulations of Ashes in Dump Cars at the Request of the City Authorities

BALTIMORE, MD., was visited on Jan. 28 and 29, 1922, with the heaviest single snowfall in the records of the local weather bureau—26½ in. falling within a period of approximately thirty-five hours. Under such trying conditions, aggravated by stalled vehicles, especially automobiles, the street railway lines of the United Railways & Electric Company were badly blocked the night of the 28th, but due to strenuous efforts that night and extending through the twenty-four hours of Sunday, the 29th, practically all the important routes were operating when people started to work Monday morning.

For a week beginning Monday, Jan. 30, the efforts of the street cleaning department were devoted to clearing the important thoroughfares of piles of snow, and this resulted in an ever-increasing accumulation of ashes and garbage. Finally, this situation began seriously to clog the alleys and sidewalks in many parts of the city. In order to make a quick and effective start on the cleaning up problem, the city authorities asked the United Railways to help to move the ashes by operating service cars at night. Notices and advertisements were run in the daily papers announcing this service and asking householders to put their receptacles full of ashes at the curb along the car routes.

Through the co-operation of the transportation and maintenance of way departments, nine 15-yd. capacity differential dump trucks and six other open-top service cars were operated nightly for about ten days from 1 to 5 a.m., making two round trips and carrying approximately 150 cu.yd. per night to the dump. This co-operative effort has enabled the regular city forces to devote their efforts to localities other than those adjacent to the car lines and has been of material assistance to the street cleaning department.

Heavy Electric Traction Abroad*

In Papers Prepared for Ninth Congress of International Railway Association Engineers of Railroad Electrifications in Europe Summarize the Situation for Their Several Countries

THE forthcoming International Congress, to be held in Rome, Italy, in April, will be the occasion of a complete review of heavy electric traction. Competent authorities in all countries having considerable electrified track will present reports, most of which if not all will be made public by the International Railway Association in advance of the congress. Abstracts of some of the papers have already appeared in this journal.† Abstracts of other papers follow.

ELECTRIFICATION IN THE SCANDINAVIAN COUNTRIES

The chief of the electrical department of the Swedish State Railways, M. I. Öfverholm, will report for Sweden and Norway. He states that these countries and Denmark have not the necessary quantity of home produced coal, but that Sweden and Norway have ample water power. The desire has long existed in Sweden to make the railways independent of foreign coal, and a royal commission to study the question of electrification was appointed in 1899. After many preliminary studies and experiments the first proposal was for the use of electric motive power on the ore-carrying road connecting Kiruna, in the mining region of Sweden, with the Norwegian port of Narvik. This road runs for 81 miles through Sweden. The electrification from Kiruna to Riksgränsen was commenced in 1910 and finished in 1915, with power supply from a hydraulic plant at Porjus. It was extended in 1917.

In 1917 the Riksdag, the Swedish Parliament, decided upon the electrification of the Kiruna-Svarton line and authorized the expenditure for the Kiruna-Gällivare and Gällivare-Nattavaara lines. The work was carried out by the personnel of the State Railways, and electrical operation was begun on the Kiruna-Gällivare line in March, 1920, and on the Gällivare-Ripats line in February, 1921. The Riksdag in 1920 granted money for the Nattavarra-Svartön line, and the Norwegian Storting has decided upon the electrification of the Riksgränsen-Svartön line. Both of these will be in operation this year.

All of this electrification is on the single-phase system, with 16,000 volts on the contact wire, and with the transmission at 80,000 volts.

For electric traction there are now twenty-two locomotives on the Riksgränsen-Gallivare line, and twelve more due, as well as two motor cars. In 1922 eleven locomotives will be delivered. Thus by the end of this year there will be forty-five locomotives and two motor cars on this line, of which four locomotives will be for express trains, one for passenger trains, twenty-eight for ore trains and twelve for freight trains and switching.

Investigations looking toward further electrifications have been made, but an unexpected fall in the price of coal and the difficulty of raising money have caused a postponement of actual work.

What has been said relates to the State Railways. In addition there are several company-owned electrifications in operation. At present work on the Klarälv railways which connect Karlstad with Munkfors, Hagfors and Filipstad is already complete or nearly so.

In Norway the Thamshavn-Lökken railway, carrying copper in the Trondjem district, has been electrified since 1908. This line has 4 per cent grades. The Rjukanbanan was electrified in 1911-1912. The Norwegian State Railways are now electrifying the Kristiania-Drammen line, and as mentioned above the road connecting Narvik and Riksgränsen will be completed at once. By the end of 1922 the whole railway from Narvik across the Scandinavian peninsula down to Lulea and Svarton will be in electric operation. Single phase is standard in Norway, 6,000 volts being used on the contact wire on the Thamshavn line and 10,000 on the Rjukan line. The line connecting with the Swedish one will have the same voltage as the latter—16,000.

A heavy suburban business is expected on the Kristiania-Drammenbanan, as well as freight and express. Twenty-four locomotives of the B + B type and 1 — B + B — 1 type have been ordered. The Norwegian State is buying up water powers and conducting studies looking toward systematic electrification of the railways.

ITALY HAS BEEN SUCCESSFUL WITH THREE-PHASE

According to Alfredo Donati, chief of the special electrification service of the Italian State Railway System, who will report for his country, the first trials of electric traction were made in Italy from 1899 to 1901. In 1901, in fact, electrical working of the Milan-Varese line, 37.3 miles, was inaugurated, with direct current, third-rail distribution. In the same year the Valtellina lines (Lecco-Colico-Sondrio and Colico-Chiavenna), 66 miles long, were electrified with low-frequency, three-phase current.

For the Valtellina lines 15 cycles were selected in the interest of transmission efficiency and mechanical simplicity in the locomotive drive, although not with-

*See Bulletin of the International Railway Association as follows: Report on electric traction, Sweden, Norway, Denmark, by M. I. Ofverholm, November, 1921, page 1934; Italy, by Alfredo Donati, December, 1921, page 2175; France, by M. Sabouret, January, 1922, page 107.

†See as follows: Report on America by George Gibbs, issue for Jan. 28, 1922, page 147.

Report on Holland and Great Britain by J. J. W. Van Loenen Martinet, issue for Dec. 3, 1921, page 988.

Report on Switzerland by Dr. E. Huber, issue for Dec. 3, 1921, page 988.

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out some difference of opinion. A voltage of 3,000 on the contact wires was selected, then considered high.

For the nine years following the successful inauguration of the above-mentioned service no considerable increase in electrification was made but the results were watched with interest and the effect was the adoption of the three phase as standard. Since 1910 much has been accomplished on lines carrying heavy traffic. Between 1910 and 1914 the two Giovi lines were electrified. These connect the port of Genoa with the interior across the Apennines and hold the record for traffic on the Italian railway system. They contain grades up to 3.5 per cent. In the same period were electrified also the Savona-Ceva line, crossing the same range; and the Mont Cenis line with its tunnel, the most important line of communication with France. During the past four years on these lines the traffic has been four times as dense as the mean for the Italian railway system.

During the few years past much activity has been manifest also on the lines near Turin. Thus by the end of 1919 it was possible to commence electrical working of the Turin-Bussoleno line and of the Bussoleno-Susa section (33 miles, of which 28 is double-track).

This provides connection with the already electrified Fréjus line (Bussoleno to Modane) and the Turin-Pinerolo line, in anticipation of connecting the whole of the electrified system of Piedmont with that of Liguria, and with the electrical installation of the Turin-Ronco line, which is due to be completed at about the present date. In 1922 the electrification of the Voghera-Alessandria, Tortona-Novi and Tortona-Arquata lines will be complete, giving access from the Giovi lines to the Milan-Chiasso line and thence to Switzerland.

The above has applied to the State Railways, but there are in Italy also company-owned lines operated electrically, amounting to mileages of 125 of standard gage and 310 of narrow gage. It should be said also that simultaneously with the development of the railways has been carried out a comprehensive system of power generation and distribution, of which the details cannot be given here.

The new program for the extension of electric traction which has been drawn up by the Railway Administration and the government anticipates the electrification of about 2,800 miles of railway. This is expected to effect a coal saving of 1,250,000 tons annually and to involve a consumption of electrical energy of 600,000,000 kw.-hr. A generator capacity of 180,000 kw. will be required. Already in hand are the following lines: Genoa-Pisa, Bologna - Pistoia - Florence, Bologna-Faenza-Florence, Pinerolo-Torre-Pellice, Bricherasio-Barge, Rome-Tivoli and Rome-Carano-Nettuno. The two lines last mentioned will form the nucleus of future electrification on the Italian peninsula.

In his report Mr. Donati states that the complication of the appearance of the overhead contact wires with the three phase is more apparent than real. The insulation between wire and wire, and between each wire and the rails in the type of suspension adopted by the State Railways is tested to 30,000 volts. There has never been any difficulty in maintaining the insulation, even on the Savona-Genoa line on the coast, where there was much difficulty in maintaining the insulation of the transmission line due to the salt carried by the wind. The main difficulty with the insulators is a mechanical one, due to the vibration caused by the passage of the contact device at high speed. The cross suspension of the contact line has been found preferable to longitudinal suspension.

The great simplicity of the three-phase induction motor, together with its great power, enables the three-phase locomotive to be made simpler and lighter than those of other types.

The Italian electric locomotives are not permitted to have a weight greater than 15 tons per axle, which is the limit of load on most of the bridges. The normal tractive effort may not exceed 10 tons on account of the draft gear of the cars. It has been found possible to build locomotives to fit these conditions capable of developing 2,000 kw. at 46.5 m.p.h. and with a total weight of 75 tons.

What Electrification Has Accomplished in Italy

The principal end which it was proposed to attain in the first electrifications from the technical standpoint was the economical increase in the capacity of the lines. This has been completely attained. For example, the traffic which on the two Giovi lines before electrification was about 306,000,000 ton-miles per annum, had within a few years thereafter increased to 734,000,000 ton-miles. The corresponding figures on the Bussoleno-Modane line were 67,000,000 and 245,000,000 ton-miles, with a maximum in 1918 of 314,000,000 ton-miles. The traffic increased three to one on the Savona-Ceva line.

The constant-speed characteristics of the three-phase locomotive are credited with much of the possibility of carrying such heavy traffic. On account of the limitations of weight per axle and tractive effort per locomotive, it has been necessary to use two or even three locomotives per train, the former being the more common. With two locomotives, one is placed at each end of the train.

A comparison of the costs chargeable to electric traction and to steam traction is given in the accompanying table for the financial year 1917-1918, for which the complete accounts are available. To make the results comparable among themselves they have been reduced to the basis of 1,000 virtual ton-kilometers hauled. As they are for comparison among themselves they have been reproduced here in their original form.

TABLE OF COMPARATIVE DATA FOR STEAM AND ELECTRICAL OPERATION ON ITALIAN STATE RAILWAYS

Figures given in lire per 1,000 virtual ton-kilometers

	Steam Traction	Electric Traction	Electric Traction on Lines of Ligurian Group and Fréjus Line
Coal supplied to the locomotives (at 248.46 lire per ton)	13.15	....	....
Electric energy for traction	.....	1.60	1.51
Locomotive staff, lubrication and various shed expenses, water supply, etc.	1.61	1.12	1.04
Maintenance of locomotives	1.22	0.80	0.62
Amortization and interest on cost of locomotives	0.64	0.77	0.62
Maintenance of electric installation	.....	1.00	0.78
Amortization and interest on cost of electric installation	.....	1.42	1.13
General expenditure on staff, provident fund, bonuses, etc.	0.42	0.45	0.37
Totals	17.04	7.17	6.07

The automatic substation is finding a place in the electrification work of the Italian State Railways. All stations having synchronous motors are designed to work automatically, with a view to reducing the expense of the staff. Some of the transformer substations have recently been changed to automatic substations, as for example that at Varazza on the Genoa-Savona line.

On the Rome-Tivoli and Rome-Carano-Nettuno electrifications the frequency of the local power supply, 45 cycles, has been adopted in place of the 15 to 17 cycles used elsewhere. On the Benevento-Foggia line the high-voltage direct-current system will be tried, but difficulty is expected on account of the weight of the locomotives.

As far as system is concerned, however, Mr. Donati expresses his belief in the technical acceptability of all, the matter of system, he thinks, having been given too much emphasis. Any other detail of the working may have a greater economic importance. The provision of a single electrical system over the entire railway system is of greater economic importance than the question of the actual system selected.

In fact, he states in concluding the report, this unified system leads to the much more complete utilization of the electrical energy, of the plant and of the staff than when adjacent sections are worked by different systems.

Large Electrification Immediately Ahead in France

At the Congress the situation in France will be reported upon by M. Sabouret, chief engineer of the tech-

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nical department of the Orleans Railway. He opens his statement by saying that in 1920 the French government made regulations regarding the application of electric traction to railways of "general interest." Three companies, the Paris-Lyons-Mediterranean, the Midi, and the Paris-Orleans have proposed to electrify within approximately twenty years a total length of line of 5,000 miles. These companies have for a long time used electric traction on isolated sections of line, including an important network of lines in an undulating country, or arteries having considerable traffic in mountainous regions, these regions being rich in water power.

After full investigation the Minister of Public Works has decided that the electrification of railways of general interest in France shall be subject to the following general regulations:

1. The primary distribution shall be by three-phase current, 50 cycles, according to the condition laid down for the great distribution companies, so that all the regional groups may have interchangeable electrical energy and may help each other mutually;
2. The traction current shall be continuous: its pressure is fixed normally at 1,500 volts (exceptionally at 3,000);
3. Every locomotive at 1,500 volts will be fitted with two current collectors, one being a third-rail collector, and the other for the overhead line; and must be able to run and collect current on any line electrified at the same voltage.

Heavy Traction Inaugurated in France in 1900

Impressed by the success of the Baltimore & Ohio tunnel electrification in Baltimore, the Orleans Company intrusted to the General Electric Company, the builders of the locomotives for that installation, the electrification of the Quai d'Orsay station in Paris. Electric service was inaugurated in June, 1900. Locomotives weighing 50 tons and of 1,000-hp. capacity were employed. The satisfactory working of this first large underground electric station induced the directors of the Pennsylvania Railroad, in the following year, to abandon the project of an aerial crossing of the Hudson River in favor of a tunnel and a large underground station in the heart of New York.

Between this time and 1910, the Orleans Company, the Ouest Company, the Paris-Lyons-Mediterranean Company, the Midi Company and the State Railways carried out a number of electrification projects also.

The second period of French electrification was divided into three parts by the war. Up to the war period the several companies continued their electrification development. Most of this was in the line of experiment, but much progress was made by the Midi in the Pyrenees, the State Railways and the Orleans Company in suburban electrification, etc.

The war turned attention from this work to that of developing sources of power, but the possibilities of using vast supplies of water power intensified the interest in electrification of railways, after the signing of the armistice permitted this. The large railway companies outlined programs calling for the total mileage mentioned earlier.

Immediately after the armistice the Minister of Public Works appointed a committee to consider and report on the whole matter. This committee, in turn, appointed two commissions, one technical the other administrative, to secure data and formulate recommendations. One of these visited the United States and other countries in 1919, and the main committee was able to report in May, 1920. As a result the regulations mentioned earlier were promulgated. The reasons for these regulations are given in full in the committee's report, and are abstracted by M. Sabouret. They have been summarized in earlier issues of the ELECTRIC RAILWAY JOURNAL.

French Electrification and the Distribution of Energy

M. Sabouret points out in his report that the use by the three companies mentioned earlier of a primary three-phase, 50-cycle distribution, offers so many advantages that they would adopt it even if the traction current were alternating and of 16 or 25 cycles frequency. Their hydro-electric stations will be far separated and surrounded by other stations. By merging their distribution in the general distribution the companies will contribute to the country-wide diffusion of energy. They will find a better investment and favorable conditions for supplementary purchases or exchanges of current.

The Midi Company has already four stations in the Pyrenees, and will eventually have 250,000 kw. available. It will partially equalize the load on the plants by means of water storage. It will probably construct stations in the Cevennes to feed the northern part of its system, and will perhaps participate with the other two companies in the development of the Truyère works as explained below.

The Paris-Lyons-Mediterranean will find its principal sources of energy on the upper and middle Rhone. The intention is to harness several high falls in the Alps and the Cevennes which can give a regular supply, and also possibly participate in the Truyère work.

In 1920 the Orleans Company obtained concessions for seven hydro-electric power stations in the Haute-Dordogne and its tributaries, in the center of its system, 250 miles from Paris and 170 miles from Toulouse. Their capacity will exceed 150,000 kw. The company has also taken an important part in the concession of dams on the Creuse, 205 miles from Paris, which will be able normally to produce 150,000 kw. unequally distributed over the year. Their working will be linked up with a steam station in course of construction at Cennevilliers, near Paris. Finally, the company will find, to the south of the Massif Central, other hydro-electric works, in construction or projected, in which it will be able to participate, in particular those of the Truyère.

The Truyère, the principal tributary of the Lot, receives the waters of a watershed of 927 sq.miles in the southeast angle formed by the Cevennes and the Monts d'Auvergne. The average power obtainable exceeds 200,000 hp., the supply being almost regular. The flow of the watercourses of the Central Plateau is complementary to those of the Alps and the Pyrenees; the Truyère will feed the Rhone and Garonne basins during the winter, and the central region during the summer.

This large program of the organization of hydro-electric energy shows clearly the obligation of the three companies to associate themselves in a work of unification required in the national interest and to promote the linking up of the three great producing districts.

In the case of the Orleans Company, for example, its participation in the combination scheme will have the effect of enabling the water power of Central France to be transmitted first into the middle Loire district and then to Paris and the neighborhood. It will also give the whole group of water power stations, in dry years, the valuable assistance of a large steam-power station.

M. Sabouret explains that most of the electrification in France was effected under conditions which render impossible the estimation of the economic result. On the line between St. Georges De Commiers and La Mure there was shown a saving in working costs of 30 per cent.

In reality it is by other than economic considerations that the companies will be guided in their choice of the first lines to be electrified. They will begin with those where increase in capacity is most urgently needed. These will supply data which will serve as a guide in the extension of the process to lines whose electrification is not demanded by any exigencies of working.

Correction in Data on Welding Flanges

IN THE issue of Feb. 4 of this paper, page 196, appeared an abstract of the paper presented by E. B. Gunn at the Central Electric Railway Association, Indianapolis, Ind., entitled "Three Years Experience in Welding Worn Flanges." A typographical error in the table analyzing the expense of welding wheels has since been found. The table should read:

150 lb. welding metal at 8 cents per pound	$12.00
30 hours welding operator labor at 60 cents	18.00
150 kw.-hr. at 2½ cents	3.75
10 hours machinist labor at 60 cents	6.00
	$39.75

The error which was made was that the figure "1" in the first line was dropped to the second line, thus materially distorting the impression as to the amount of welding metal and the amount of labor.

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A.I.E.E. Holds Midwinter Convention

THE tenth midwinter convention of the American Institute of Electrical Engineers was held in the Engineering Societies Building, New York, N. Y., Feb. 15-17. Papers and discussions given on lightning arrester practice, on the dielectric strength of oils, the flashing of rotary converters and the heating of railway motors were of interest to the electric railway engineers. An abstract of the paper on factors which determine railway motor temperatures by G. E. Luke, Westinghouse Electric & Manufacturing Company, was given in last week's issue of the ELECTRIC RAILWAY JOURNAL.

In the discussion of this paper C. J. Fechheimer illustrated the similarity between the time temperature curve equations and the equations of the building up of current in circuits containing an inductance or capacitance. F. W. Peters said that the percentage of failures due purely to overheating was small. Many failures that seemed to be due to overload often were caused by defects in the motors themselves, such as the breaking down of insulation due to a loose coil or to the accumulation of moisture.

In a paper on the causes of flashing of synchronous converters E. B. Shand, Westinghouse Electric & Manufacturing Company, said that heavy load surges in synchronous converters produce unbalanced armature reactions and abnormal voltage conditions on the commutator, thus constituting one of the chief causes of flashing, according to extensive studies made by the author. To increase the momentary overload capacity the following main lines of progress were suggested:

1. The improvement of synchronous characteristics of the converter installation to obtain high stability and the reduction of the moment of inertia of the rotating masses of the converter.

2. The reduction of the effectiveness of the unbalanced reactions in producing high voltages in the commutating zone. (High-reluctance commutating poles are an instance of this.)

3. The prevention of the complete propagation or culmination of the arc by the insulation of conducting parts around the commutator by means of flash-guards and other devices.

4. The limitation, by external means, of the maximum severity of the surges thrown on the machine (in which might be included the high-speed circuit breaker.)

These principles have been utilized in devising suitable means of improving the characteristics of commercial types of 60-cycle railway synchronous converters, with the result that they have proved themselves much superior to their predecessors.

A paper in defense of standard practice in lightning arresters was given by E. E. F. Creighton of the General Electric Company. He said that in a recent investigation conducted by the protective devices committee criticisms were received of current lightning arrester practice as applied to transmission lines. For the most part practice in lightning arresters is standardized. In fundamental principles there have been no changes for many years, though improvements in details, especially of construction, are still being made. In answer to criticisms made by a few prominent engineers, it is maintained as fundamental that a high discharge rate for an arrester is an absolute essential. The burden of proof falls on those engineers who use arresters of low discharge rate. These arresters cannot discharge the dangerous lightning surges on overhead lines since the current in a traveling wave is about 2 amp. for every thousand volts of lightning potential. Since there are lightning arresters of low discharge rate in apparently satisfactory use, an explanation for this anomaly is found in the use of insulators of low arc-over voltage. Either the lightning potential is relieved locally at the insulator or the resultant traveling wave is of too low voltage when it reaches the transformer greatly to endanger the insulation. However, such poor line insulation is not a solution of the problem of continuity of service. Why not save the cost of the useless lighting arrester?

How many arresters should be used to protect a six-feeder system? It depends on the conditions of insulation in circuit breakers and the importance of continuity of service. According to the conditions discussed in the paper, from one arrester to seven arresters with auxiliaries are needed.

The use of no arresters was discussed in this paper from three standpoints—(1) if it is contended that lightning is not of sufficient voltage to cause damage; (2) if it is considered a better investment to put lightning-arrester money into spare transformers; (3) if it is considered good practice to insulate a transformer so highly as to give it immunity from lightning. The conclusion reached was that each of these suppositions is faulty and dangerous.

A new method of inspection of aluminum arresters was proposed, based on the fact that the power factor of the cells varies considerably according to their condition. There are promises of effecting economies in overhauling aluminum arresters and of lengthening their life. Experiences with a 33-kv. arrester in service thirteen years without overhauling were given. The plates are still in good condition. The usual damaging deposits of decomposed oil on the aluminum film were prevented by using an initial rush of charging current great enough to throw them off. The electrolyte is partly exhausted in strength and needs changing. However, the discharge rate is still high.

In the discussion a new valve type of arrester was described by Dr. Joseph Slepian.

Union Internationale Will Change Name

THE Union Internationale de Tramways et de Chemins de fer d'Intérêt Local has called a meeting to be held in Brussels on Feb. 18 to adopt a new constitution and by-laws, according to the plan already announced, the purpose being to reorganize so as to confine the members of the association to the Entente and allied nations and neutral countries. At the same time the plan is to include the words "transports publics automobiles" in the name of the association so that its complete name, when rendered in English, will be the International Street and Interurban Railway and Bus Association.

Other changes in the constitution on which a vote was to be taken on Feb. 18, in addition to excluding companies in the Central Powers, are as follows:

The executive committee is to consist of not less than ten nor more than twenty members (instead of not less than seven nor more than fifteen) and three vice-presidents instead of two.

The official language of the association will be French instead of both French and German, and the proceedings will be printed only in French. There is a slight change made in the annual dues, which are based on the gross receipts and are payable in Belgian francs. The dues for individual members proposed are 40 francs instead of 20 francs a year.

Accident Prevention on Electric Railways

THE following bibliography in regard to accident prevention on electric railways has recently been compiled by Miss Mary B. Day, librarian National Safety Council of Chicago:

INDEXES

Industrial Arts Index, published by the H. W. Wilson Company, New York. See references to magazine articles under the subjects "Electric Railroads—Accidents" and "Street Railroads—Accidents." These indexes index such publications as ELECTRIC RAILWAY JOURNAL, *Electrical Review*, etc.

National Safety Council, Proceedings, 1912 date. See references under subjects, "Electric Railway Section" and "Electric Railways." Each year an analytical index by subject and author is got out for the Proceedings. In 1918 a cumulative index covering the seven preceding years was compiled. This cumulative index appeared in the 1918 Proceedings.

National Safety Council News. Six months' index appears in January and July issues. See references under "Electric Railways" and "Street Railways."

BULLETINS

National Safety Council, Electric Railway Bulletins suitable for posting on company bulletin boards. Some two hundred have been issued up to date. They come out each month and are included in National Safety Council service.

COMPANY BULLETINS

Brooklyn Rapid Transit, Instruction Branch, Surface Transportation Department, Bulletin board bulletins.

East St. Louis and Suburban Railway, Bulletin board bulletins.

Columbus Railway Power & Light Company, Safety school bulletins. Bulletin board bulletins.

Puget Sound Traction, Light & Power Company, Bulletin board bulletins.

MISCELLANEOUS PUBLICATIONS

American Electric Railway Association, Accidents and safety work. An outline of the safety organization and activities of a large number of companies, together with

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statistics showing the number, kind and cost of accidents, 1921. (Typewritten.)

American Electric Railway Association, Legal requirements covering the carrying of jacks on cars, 1920. (Typewritten.)

Andrews, H. L., Safety Cars, 1919. (Presented at eleventh annual convention of the Wisconsin Electrical Association.) (Pamphlet.)

Brooklyn Rapid Transit Company, Joint Efficiency Campaign leaflets:

Air brake efficiency, 1917. Baseball and safety, 1917. Blind accidents, look out for them, 1917. Eyes, 1917. Fire lessons, 1917. Fire losses, 1917. Good housekeeping, 1917. Motors and brakes, 1917. Our motormen and your drivers, 1916. Questions, 1917. Save power, 1917. When accidents happen, 1917.

Brooklyn Rapid Transit Company, Bulletins, numbers 1-5. Pamphlets 1914:

Safety organization system, 1914. Brooklyn's safety crusade, 1914. If you must hurry, 1916.

Beaver Valley Traction Company, Father, mother, teacher. (Pamphlet.)

Beaver Valley Traction Company, Employees' service code, n.d. (Pamphlet.)

Cordell, Henry, Safety rules for men in the mechanical department. (In Safety bulletin of the Bureau of Safety, December, 1920, pages 14-15.

DeBlois, L. A., Safety in the one-man car, 1921. (Typewritten sheets.)

East St. Louis and Suburban Company, Safety first bulletin, 1915. (Pamphlet.)

Handlon, J. H., How to avoid accidents, 1911. (Pamphlet.)

Handlon, J. H., For humanity's sake, 1918. (Pamphlet.) Issued by United Railroads of San Francisco, Cal.

Hill, O. R., Observations on braking. In Safety Bulletin of the Bureau of Safety, March, 1920, pages 13-14.

Johnson, F. W., The prevention of accidents, 1910. McGraw-Hill Book Company, New York. (Pamphlet.)

Milwaukee Electric Railway & Light Company, Primer of precaution published in the interests of "Safety First." 1916. (Pamphlet.)

Milwaukee Electric Railway & Light Company, Some aspects of one-man safety car operation, with special reference to the Milwaukee situation, 1921. (Typewritten.)

Memphis Street Railway Company, Smooth operation leads to safety, 1916. (Pamphlet.)

McDougall, R. E., Electric Railway hazards. In Safety bulletin of the Bureau of Safety. November, 1920, pages 14-15.

Quebec Railway, Light & Power Company, Prevention of accidents, 1916. (Pamphlet.)

Quebec Railway, Light & Power Company, Slipping rails, 1916. Accident reports, 1917.

San Francisco-Oakland Terminal Railways, How to get a good coasting record, 1917. (No. 20.) (Pamphlet.)

Union Pacific System, Common standard specifications number 1,022. Electric light, power supply and trolley lines crossing railroad tracks and rights of way, 1920.

United States Bureau of Standards, Data on electric railway track leakage, 1916. (Technologic paper No. 75.) (Pamphlet.)

United States Bureau of Standards, National electrical safety code, 1921. (Third edition No. 3.) (Pamphlet.)

Winnipeg Electric Railway, Circulars:

Car service efficiency, 1916. (Circular No. 13.) Economy and prevention, 1914. (Circular No. 5.) Gongs, 1915. (Circular No. 8.) Old timers' association—Safety First, 1914. (Circular No. 3.) Safety first, slipping rails and railway crossings, 1917. (Circular No. 15.)

TRADE CIRCULARS ISSUED BY MANUFACTURERS

The National Safety Council Library has on file an up-to-date file of trade circulars of manufacturers who sell or manufacture various safety devices in use by electric railways. Lists will be furnished upon request.

American Association News

Committee on Safety Work

THE first meeting of the committee on safety work of the Transportation & Traffic Association was held in Pittsburgh on Jan. 25. Those present were E. D. Reed, D. E. Parsons, Claude L. Van Auken, G. T. Seely and W. H. Boyce. The discussion was active and many helpful ideas were brought out.

It was decided that the task of this committee would be to secure the active co-operation of all utility managers and department heads by, in the somewhat overworked words of the day, "selling the idea of safety to them." To do this it was decided that the form of the report should not be along lines similar to the reports of other committees. Instead, the committee decided that its report should have a cartoon cover and be illustrated with cartoons or photographs, that the appeal or sales talk of the committee be made the body of the report, and that the appendixes contain a partial bibliography, statistics as to what had been accomplished on other properties, outlines of various methods of putting safety campaigns into effect, etc. It was also deemed advisable that the committee get in touch with the heads of the four other associations and request that the committee be permitted to furnish a three to five minute talk on safety at each meeting held by these other associations, and also attempt to secure the right from these other associations to run safety slogans on each page of each pamphlet that it puts out. The argument for this privilege would be, not that the safety committee work is any more important than that of any other committee, but entirely from a humanitarian standpoint—the conserving of life and limb.

The committee decided to attempt to have the advertising section of the American Electric Railway Association send out a pictorial broadside containing a small amount of wording, to depict in this way to the various managements some of the methods found successful to other companies. It was suggested that on the broadside a card be attached, addressed to the person who opens the mail, calling attention to the fact that he may be the means of causing a life or lives to be lost if he does not send this pamphlet on to the person addressed or to the highest officer of the company.

It was decided that the committee, with the approval of the proper officers of the association, should hold a safety exhibit of newspaper, car card, bulletin board, dash board, and pamphlet advertising at the midyear meeting and that it should attempt to get the National Safety Council to furnish a part of this exhibit properly mounted. A similar but larger exhibit will be made at the annual meeting, if the plans of the committee are followed out. The committee will also ask the presidents of other companies that have continuously conducted safety work for several years past to give a brief outline of their experience with safety—an expression in just a few words as to the concrete results that continuous safety work had accomplished for those properties in the prevention of accidents, increasing morale and efficiency, and the saving of dollars and cents on their property; then show other operators throughout the country, through magazine articles, what the managements of properties that have been engaged in continuous safety work think of such work.

The committee will ask the editors of the technical papers to publish a different one of these articles each month between now and convention time. The chairman of the committee agreed to secure the data necessary for the publishing of an article concerning the different safety methods and plans used on various properties throughout the country.

The committee realizes that one really serious question that confronts it is how to get companies who had tried haphazard, unorganized safety methods from which they, of course, did not receive the proper results, to make another effort but try properly planned, organized and continuous safety work. The committee was of the opinion that although the campaign methods of safety work are better than nothing, the only true value that can be received from safety work is the sort of safety work that is done continuously. The committee believes that every railway company should be doing safety work continuously on a well defined program. The point was also brought out that while the money spent on accidents and taxes is not productive to the benefit of a street railway company, there might be some argument in favor of the taxes, but absolutely none in favor of accident cost.

Mr. Parsons of the safety committee is to prepare, probably as an appendix, a set of questions and answers for "unconverted" managers, such as this one, which would probably be the first to be asked: "If all the men in the operating department obeyed all the rules in the book, would there be any need for safety work?"

Decisions in connection with the association were as follows: Secure a three-minute speaker for each meeting at the convention, provided this privilege is accorded; see if *Aera* will give a cover, before the convention, devoted to safety; publish in *Aera*, in the name of the safety committee, an open letter to railway managers, asking each what he is doing for safety.

One problem of the committee is to show how collisions with autos can be decreased by continuous safety work. It intends to prove that accident prevention does not cost a great deal of money compared to the claim department cost and for the benefit derived.

The committee believes in, approves of, recommends and will support the National Safety Council, yet out of more than 900 railways but 110 were supporting this council last year.

It was decided that at the next meeting of the safety committee, which will be held at the Hotel Claypool, Indianapolis, Feb. 27, 1922, or prior to that time, some members of the committee should meet with some members of the National Safety Council to secure their ideas on selling the idea of safety.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Purchase Outlook Improved

Better Spirit Appears to Prevail at Detroit Since Purchase Negotiations Have Been Resumed

Negotiations between the Detroit (Mich.) United Railway and the Street Railway Commission of the city of Detroit arranged for following the recent meeting of stockholders of the company have apparently brought the two parties near a settlement although a price satisfactory to both parties has not been reached.

CITY OFFERS $19,500,000 FOR LINES

It was announced following the meeting on Feb. 17 that the city had offered the company $19,500,000 for its entire city system. This corresponds closely with the offer made by Mayor Couzens, of $16,500,000 plus the difference between the assessed value of the company's real-estate in 1919 and the actual value of the real estate at the present time.

In attempting to compare the city's first offer with the counter proposal made by the representatives of the Detroit United Railway, difficulty was experienced due to the fact that two different bases were used in the two offers. Negotiations were adjourned to permit the division of the property into classes such as tracks, real estate etc. and place a price on each classification. The city's offer of $19,500,000 quickly followed.

The company's representatives met the city's offer with a counter proposal naming $20,000,000 as a price on the company's city system exclusive of its real estate and carhouse in Highland Park. This property, the city claims, is necessary for the completion of the city-owned system.

The stockholders were represented by A. Avila Gingras, who made a plea to the commission to revise its offer to bring the figure named to agree more closely with the company's figures. The company's offer to sell at $20,000,000 if the carhouse and shops in Highland Park were not included, the city refused to consider as it regards these as essential to the operation of the municipal railway under the present plan of expansion.

MAYOR NOT AT CONFERENCES

Mayor Couzens was not present at the conferences held late in the week. The city was represented by G. O. Ellis and H. H. Esselstyn, members of the Street Railway Commission; Clarence E. Wilcox, corporation counsel; Joseph S. Goodwin, general manager of the municipal system, and Ross Schram, assistant general manager.

The company was represented by A. Avila Gingras and J. C. Butterworth, directors; J. C. Hutchins, chairman of the board; E. J. Burdick, the general manager, and Elliott G. Stevenson, counsel.

The company's proposal to revise its offer to permit the city to purchase that part of the property in Highland Park east of the Second Avenue so as to give the city the carhouse but permit the company to retain the shops and acreage is being considered by the commission in an attempt to reconcile it with the $19,500,000 price. The commission's recommendatons are to be reported to the Mayor and when an agreement is reached between the Mayor and the commission in regard to the revision of the offer further negotiation will be carried on with the company's officials.

The mandamus action to require the city to enforce the provisions of the ouster ordinance to compel the Detroit United Railway, to remove its tracks from Fort Street and Woodward Avenue has been dismissed by Judge Marschner because of the failure of the plaintiff to obtain service on the Mayor, members of the Council and other city officials named. Attorneys for the plaintiff announced that a new action is to be filed naming all the city officials connected with the administration of city ordinances.

Illinois Central Getting Ready for Electrification

Announcement has been made that President C. H. Markham of the Illinois Central Railroad, will present a proposition to the stockholders on April 19, involving authorization of an issue of $50,000,000 preferred stock to be sold at various times as needed in the work of electrifying the lines in Chicago and constructing new freight and passenger facilities. As has been discussed in these columns before, the Illinois Central entered into a contract ordinance passed by city of Chicago on July 21, 1919, whereby it agreed to begin electrification of the lines within the city within five years and to complete this work within five years more.

Since the contract ordinance was entered into, the company has been doing a great deal of work leading up to the decision as to the system of electrification which will be used and bearing on the many correlated problems involved in the very extensive improvement of the whole lake shore area occupied by the railroad. No decision has been reached as yet as to the system of electrification, but it is expected that an announcement will be forthcoming in the near future. The financial plan, as proposed, will be such as to enable the directors to take advantage of market conditions in disposing of the preferred stock.

Service-at-Cost Amendment Explained

Full explanation of the provisions of the bill introduced jointly in the Legislature of New York has been made by Senator Homer E. A. Dick and Assemblyman Simon L. Adler, Rochester, which bears on the service-at-cost street railway contract of that city.

The measure in question is still in committee, but is expected to be favorably reported soon. The bill amends the public-service-commission and transit-commission laws by adding three subdivisions thereto, being added to section 49 and chapter 48 of the consolidated laws.

Subdivision 9 defines a service-at-cost contract. Subdivision 10 authorizes municipal corporations and street surface railroad corporations to enter into such contracts. Subdivision 11 provides for the approval of such contracts by the Public Service Commission. The proposed bill applies only to municipal corporations having a population of less than 1,000,000.

In explaining the provisions of the new measure the sponsors of it said:

> In general, it may be said that the public, the railroad company, the municipal corporation and the Public Service Commission are all benefited by this bill. Where in any community the citizens as represented by the municipal corporation may enter into an agreement with the railroad company, and where the railroad corporation so desires, there seems to be no valid reasons for not permitting such harmonious co-operation. The Public Service Commission is relieved thereby from the possibility of continual rate cases with respect to any surface railroad corporation entering into such an agreement for the life of the contract. A considerable sum is saved to the street railroad company and to the municipal corporation by doing away with litigation and the tremendous expense of experts.
>
> It is to be specifically noted that a safeguard is continued by providing that before the contract shall be effective it shall be approved by the Public Service Commission.

Pacific Electric States Its Case

To explain its position in the present controversy over rate increases granted by the California State Railroad Commission, the Pacific Electric Railway, Los Angeles, has issued a ten-page pamphlet, called "Should the Users of a Public Utility Pay the Cost of Service?" The history of the rate case is reviewed, the valuation statistics discussed, and the final rate adjustments restated. All of the topics have been discussed in the reports of the commission and may be found in preceeding issues of the ELECTRIC RAILWAY JOURNAL. After reminding the reader that stockholders have never received a dividend, the pamphlet concludes:

> Finally, this company desires to serve well the public convenience. It asks only a fair return on its property. It wants all rates established on a just and reasonable basis. It asks your co-operation in solving the present problem.

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Montreal Contract Is Exacting

Explanation of Service-at-Cost Agreement Made by President of Commission

The service-at-cost contract between the Montreal (Que.) Tramways and the city of Montreal, recently the subject of an address by J. F. Saint-Cyr, president of the Montreal Tramways Commission, divides the authority among the representatives of the city, the company and the commission. This last body was appointed the latter part of April, 1918, following the acceptance of the contract by city and company on Jan. 9, 1918. The revenue is to be dispensed in the following order: operating expenses and taxes, maintenance and revenues, return on capital invested, city rentals, and contingent reserve fund.

City rentals are an additional requirement to the city taxes. In the United States a commission of inquiry in 1919 held one of the essentials of a service-at-cost contract to be that the companies be free from taxes and imposts. The Montreal contract, however, held that the company should pay what corresponds to the rental formerly paid to the city. It further stated that this should be collected, not from the general taxpayer, but from the traveling public. Mr. Saint-Cyr explained that the nature of this tax must thus be "construed as an indirect tax levied on passengers on the city's account."

The surplus is divided so that 20 per cent goes to the company, 30 per cent to the city, and 50 per cent to the fares reduction fund.

Operation under the contract for the period from February, 1918, to June 30, 1919, resulted in a deficit of $1,364,111. Mr. Saint-Cyr explained that this was due to a lowered fare rate enacted in October, more than three months after the beginning of the fiscal year. The reduced fare was the result of an appeal by the city to the rate set by the Public Utilities Commission. When the commission again raised the fares, the means provided in the contract for overcoming a deficit, the city again forced a reduction.

That year's deficit amounted to $364,700. Though there was no appeal the third year, the company had to do certain street repairing at the request of the city, resulting in a deficit for 1920-21 of $239,022. Thus the 1921-22 period was started with an accumulated burden of $1,967,934.

Mr. Saint-Cyr accompanied his address with a tabled analysis of the company's finances. Snow removal, a cost borne by no other company, according to Mr. Saint-Cyr, cost the city $217,152. For 1921, the company's figures are as follows:

Gross receipts	$11,773,004
Expenditure	
Operating expenses and taxes	6 375,283
Maintenance and renewal fund	2,529,055
Fixed charges	3,107,689
	$12,012,027
Deficit	$239,022

The valuation of the company is stated in the contract as $36,286,295. The company receives a 6 per cent return on its capital value, but pays 4½ per cent and 5 per cent on its bonds and thereby is able to pay a 10 per cent dividend on the par value of the capital stock. No dividends were paid the first year of the contract, but they were subsequently resumed.

The average fare in Montreal is 6.10 cents, the single fare zone measuring 68 square miles. The Montreal Tramways Company succeeded, in 1911, the Montreal Street Railway, which in turn had taken over the Montreal City Passenger Railway. The Montreal Tramways Company also absorbed the Montreal Park & Island Railway and the Montreal Terminal Railway.

Bus Operators Oppose Regulatory Measure

A new ordinance for regulating the operation of motor buses in Anderson, Ind., was introduced in the City Council recently and, after a first reading, there was a short debate among members of the Council. Further action on the ordinance was deferred until the next meeting of the Council body.

The measure introduced at Anderson is similar to an ordinance recently passed by the City Conucil at Muncie. It proposes that motor buses be prohibited from operating along streets traversed by city street cars. It also regulates the capacity of motor buses and provides for a license fee of $25 to $35 a year, according to the size of the vehicle. The ordinance also would require bus owners to furnish an indemnity bond or liability insurance.

The bus operators assert the measure is class legislation, and said they would take the matter into court, if the ordinance is passed. The Council indicated that the measure would be adopted at the next meeting. The bus operators contended that the ordinance is favorable to the Union Traction Company.

Ohio Line Fights Buses

The Maumee Valley Railways & Light Company, Toledo, Ohio, has started a war on the buses which operate between Toledo and the up-river towns of Maumee and Perrysburg. Officials of the railway, which has been operating under a receiver for a year, have informed both municipalities that it is a question of whether bus transportation or electric cars shall stay. If the buses are not barred from competing on the present basis the railway will withdraw its cars.

The railway officials say that the Perrysburg side of the valley line is losing $600 a day at present rates. The bus owners declared to members of the Perrysburg Council that they have only entered the business because of the demands from citizens for service. They claim to be able to save the average suburban workingman about $4 a month on his transportation to and from the city.

Bus Order Upheld

Toledo Vehicles Must Respect Order Barring Them from Downtown District

Buses in Toledo, Ohio, must continue to obey the order of Safety Director Gilson Light barring them from downtown streets, for the Court of Appeals has reversed the decision of Common Pleas Court by a vote of two to one.

The bus owners immediately announced that they would appeal the case to the Supreme Court, but city attorneys have pointed out that there is no way of appeal left open. The ordinance has been held constitutional by the Supreme Court already.

Buses Barred Downtown

The bus operators had contended that the order barring them from downtown streets deprived them of property without due process of law; that the order was unreasonable, and that the safety director had no power under the ordinance to issue the order. The majority opinion declared:

> The evidence offered on behalf of the city proves beyond all question that the restricted area is highly congested and that the operation of buses adds very materially to the congestion.
>
> If the order of the safety director was made wholly or in part with the view of furthering the safety of pedestrians in crossing the streets, it certainly is commendable.

The conclusion reached on the power of the director to exclude buses was as follows:

> It appears from the language above quoted (section of the ordinance) that the director of public safety has full power to establish routes and to exclude bus service from certain streets or parts of streets in the interest of public welfare, and that the regulation and control of buses operated for hire is imposed upon that official and that the ordinance gives to the director the power to require licensees to comply with the regulations established.

They also held that the order violated no constitutional right of the bus operators agreeing that a bus license did not confer a property right to them in the street.

Judge Chittenden did not concur with Judges Richards and Kinkade on the point of power granted to the director by the ordinance. He contended that the ordinance provided for appeal in the case of refusal of license and that if the section gave the director arbitrary power to define the routes it was a virtual annulment of appeal.

Fewer Buses in Service

Street Railway Commissioner Wilfred E. Cann, who has been checking regularly the operations of buses, declared that the number in operation had dropped from about ninety to seventy since the order has been in effect.

January operations of the cars of the Community Traction Company will net about $6,500 after all fixed charges and apportionments to funds have been met.

Commissioner Cann is now preparing his annual report to be presented to Council when that body is organized to receive it. The deliberations of the Council have been held up by a fight in that body.

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Industrial Class Plan For Subway

Peak Traffic Would Be Distributed Over Two-Hour Period Under Proposed System

Distribution of the peak traffic on New York city subway lines over a two-hour period may result in the use of a method whereby each class of workers begins and quits work at the same time. Daniel L. Turner, consulting engineer of the Traction Commission, hopes that with this method employers will not fear the proposed system, for one employer would compete on equal terms with another.

TENDENCY OF TRAFFIC ALWAYS CHANGING

Changes in the tendency of travel are most acute, of course, in the morning and in the late afternoon, according to Mr. Turner, or from 7:30 to 9:30 and from 5 to 7. Mr. Turner, in discussing his plan, said:

In the morning 9.7 per cent and at night 10.2 per cent of the total twenty-four-hour two-direction traffic is carried in one direction. This means that during the homeward rush hour at night, or during the most intensive hourly traffic period, more than 10 per cent of the total twenty-four-hour traffic is carried during less than 2 per cent of the total twenty-four-hour traveling period.

In the past, traffic on the street railway, subway and elevated lines in New York City has nearly doubled every fifteen years. The average daily traffic of all lines is now nearly 6,500,000. The total traffic carried during the year 1920 on all lines was approximately 2,365,000,000—approximately double the number of passengers carried on all of the steam railroads in the country. This was an increase over 1919 of nearly 285,000,000 passengers. Reduced to months, it means that during the average month of 1920, 23,000,000 more passengers were carried than during the average month of 1919; or, reduced to days, it means that during the average day in 1920, 750,000 more passengers were carried than during the average day in 1919.

4,200 ADDITIONAL PASSENGERS A DAY

Expressed in another manner, it means that on every day during 1920, nearly 4,200 more passengers were carried than on the preceding day. Or it means that the increase in traffic each day over the preceding day was equivalent to the capacity of nearly four 10-car subway express trains.

New facilities cannot be made available in less than five years. It is therefore of the utmost importance that the capacity of the existing facilities be utilized to the maximum extent possible. In my judgment there is no other single thing that can be done which will be as efficacious in enabling the existing facilities to do their maximum work as the spreading of the traffic peak.

Utilizing the existing facilities during the entire two-hour period to the same extent as they are utilizied during the maximum fifteen-minute period would enable the existing city-owned lines to carry 60 per cent. more passengers than they now carry. A transit line will develop during the twenty-four hours of the day an amount of traffic proportional to its traffic capacity at the peak of the traffic period. This would mean in the case of the Interborough alone, that it could carry 3,200,000 passengers instead of 2,000,000 passengers a day. But what this would really mean in the case of all city-owned lines can best be shown by measuring the increase in capacity with the cost of new facilities which would be necessary to provide for it with the present degree of use.

Contracts 1, 2, 3 and 4, covering all of the city-owned rapid transit lines in operation, have cost the city and companies together to produce to date approximately $454,000,000. Sixty per cent. of this is $272,000,000. A large portion of these facilities were constructed under pre-war prices. To reproduce them now would probably cost at least $500,000,000. Therefore, spreading the traffic peak evenly over the two hours morning and night would in this sense increase the capacity of the existing facilities as much as new facilities costing perhaps from $200,000,000 to $300,000,000 could represent.

Real estate will increase in value in the outlying districts under the new system, according to representatives of realty companies.

3,600,944 Fewer Passengers in Atlanta in 1921

A total of 93,210,072 passengers were carried by the Georgia Railway & Power Company, Atlanta, Ga., during 1921, whereas during the previous year 96,811,016 rode on the cars. Accidents of every sort were registered, and numbered 5,977, a decrease of 770 over the preceding year. Only one person was killed while riding on the cars of the company.

Other statistics given at the company offices included taxes which amounted to $916,764 as against $776,633 for 1920; number of employees on Dec. 31, 1921, 3,088; improvement of electrical service, $298,613; track and paving work, $258,079, and $358,741 for improvements in Atlanta and Decatur.

More Frequent and Cheaper Service Promised

Both cheaper and better service are promised the patrons of the Southern Cambria Railway, Johnstown, Pa., after March 1, according to a recent statement of George Palm, general manager of the company. Books containing 100 zone tickets will be reduced $1, that is from $7.50 to $6.50. There will also be smaller books for sale containing fifty-two tickets at a cost of $3.50. Special rates between Johnstown and South Fork and between Nant-y-glo and Ebensburg will be offered to workmen. Students' tickets will be lowered at the rate of 1 cent per zone.

There will be more frequent service provided for passengers. To facilitate freight handling and for the benefit of local shippers there will be a later freight service in the morning and afternoon.

746 Employees Enabled to Buy Homes

The United Railways Savings & Loan Association, St. Louis, Mo., has made application to the Secretary of State of Missouri to increase the capital stock from $4,000,000 to $5,000,000. The association, a separate corporation not affected by the receivership covering the United Railways, St. Louis, is composed of 5,000 employees of that company and members of their families. It has assets in cash and real estate mortgages totaling about $1,500,000.

The association was started six years ago with 125 charter members and capital stock of $1,000,000. Its growth has been steady, and the monthly receipts at present average more than $100,000. Through the association 746 employees have been enabled to build or buy homes, and others are building or buying at the rate of from ten to fifteen every month.

Six per cent interest is paid on savings deposits, and depositors are permitted to draw out their savings at any time without loss of principal. There are comparatively few withdrawals. Those who get building loans find that the net cost is less than 4 per cent. United Railways management furnished the association with offices rent free and contributes $200 a month toward overhead expenses.

Commission Activities to Relieve Traffic Congestion

Chief Engineer, H. Z. Osborne, Jr. of the Los Angeles, Cal., Board of Public Utilities declares in his report to the Board of the activities to date of the Greater Los Angeles Traffic Commission that Los Angeles must have subways under the central or congested section of the city. This commission is making a thorough study of the traffic problems of the city, and will recommend a step-by-step program to relieve the congestion in the city streets for the present and for the next fifteen years. The organization of this Commission was authorized by the Board of Public Utilities and the City Council as a means of bringing together in one body all the civic organizations and citizens interested in obtaining relief for the city's traffic problems.

Mr. Osborne states that one of the first steps he believes must be taken is to remove from the streets of Los Angeles the cars of the Pacific Electric Railway and to place them in subways so that these lines can furnish rapid transit to Hollywood, the beaches, the San Gabriel Valley cities, towns and other suburbs which they serve. He further states that with subways under the central portion of Los Angeles for much of the street railway traffic, Hollywood, Vineyard Station, Watts, Covina Junction and similar suburban points of the Pacific Electric Lines will become distributing stations where main-line suburban trains from the subways can distribute their passengers to all suburbs.

The Traffic Commission is also restudying the parking conditions in the downtown streets as they are so regulated by ordinance, and it is possible, considering the relation that the parking regulations downtown bear to the traffic congestion it will be recommended that even more drastic regulations be enforced than now exist, so that automobiles, street cars and pedestrians can move more rapidly in the downtown section.

City Will Appeal

According to an order of a district court sitting in the city of Helena, Mont., the Helena Light & Railway Company can abandon its Kenwood line which is being operated at a loss. The judge accordingly threw out the city's claim that according to its franchise the line cannot be abandoned. The city will appeal to the Supreme Court from the order authorizing the tearing up of tracks on this line.

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Spartanburg Votes Against Amendments

By a vote of 639 to 320 the voters of Spartanburg, S. C., on Feb. 14 registered their protest at the polls to granting amendments to the franchise of the South Carolina Light, Power & Railway Company. The proposed amendments to the franchise were as follows:

1. The rate of fare therein provided shall be 7 cents.
2. The railway extensions provided for to Clifton Mill No. 3 and Whitney Mill is repealed.
3. Existing contract to repair the city as set forth in Section 5 of the said franchise shall continue, but the City Council is authorized to enter into such arrangements in connection therewith as it deems most advantageous to the city's interests.
4. That the maximum rate for gas shall not exceed the present rate of $2 per 1,000 cu.ft.

Many were prevented from voting because they had not paid their poll tax. Disappointment over the outcome of the election was expressed by G. B. Tripp, receiver of the property.

News Notes

Will Consider Electrification.—A request from interested municipalities for the electrification of the Galt-Elmira branch of the Grand Trunk Railway, which is now a part of the Canadian National Railway System, has been received by the dominion government at Ottawa.

Franchise Granted. — A twenty-year franchise was recently granted to the Chicago & Joliet Electric Railway, Joliet, Ill., by the Township Highway Commission. Officials of the road have announced improvements and changes in route. Ingalls Park will now have direct service.

Cost Up to Township.—The Mercer County (N. J.) Board of Chosen Freeholders has decided that the cost of relocating the tracks of the Trenton & Mercer County Traction Corporation Trenton, N. J., on the White Horse-Yardville road is up to the Hamilton Township Committee. The township committee granted the traction company the franchise for the paving of the tracks on one side of the road several years ago, but the township wants them removed to the middle so the road can be paved. The cost of relocating the tracks will cost about $45,000.

Want State Agency to Study Situation.—Creation of an authorized state agency to study the rapid transit problem in New Jersey is the goal now aimed for by the North Jersey Rapid Transit Committee. It has appointed a sub-committee to draw up a bill providing for the state agency, and will present it to the Legislature, probably on Feb. 23. The North Jersey Rapid Transit Committee came into existence Dec. 15 at a conference in Paterson, and has for its object increasing the speed, convenience and comfort of passenger service between New York and communities in northern New Jersey.

Columbia Men Strike.—Following the discharge of twenty-one employees of the Columbia Railway, Gas & Electric Company, Columbia, S. C., on Feb. 14 a strike was voted upon by the railway employees. On Feb. 16 no cars were running on the company's lines. F. H. Knox, president of the company, stated that he was preparing a statement explaining the company's position but that no plans had been made for the resumption of service. It is said that the company has been operating at a loss for some time and that officials intimated that relief would have to be forthcoming.

May Thwart Commission's Plans.—Legislation is to be introduced at the present session of the Legislature, Premier E. S. Drury has announced, which will curb the powers of the Hydro-Electric Power Commission of Ontario, of which Sir Adam Beck is the head. This is the outcome of the controversy between Beck and Drury regarding the advisability of establishing a system of municipally-owned hydro-electric radials in western Ontario, a government commission having reported against the project. The new legislation will make it impossible for the Hydro-Electric Commission to undertake the construction, acquisition or operation of radial lines.

Portland Improvements Planned.—The Portland Railway, Light & Power Company, Portland, Ore., is planning a number of improvements to follow its recent issue of stock. These include track and roadway changes to the amount of $250,000, installation of added tie-line capacity between sub-stations, establishment of the outdoor type sub-stations as distribution centers; placement of new switching appliances on high tension lines; construction of new lines and enlargement of the capacity of power station. Approximately 1,800 employees of the company have subscribed for a total of $300,000 of the 7 per cent stock. The stock issue has been mentioned previously in the ELECTRIC RAILWAY JOURNAL.

Separate Commission Proposed for District of Columbia.—Senator Dela, chairman of the District of Columbia Committee, has introduced a bill creating a separate Public Utilities Commission for the National Capital. The present District Commissioners now act as a utilities commission. The new commission would be appointed by the President, two civil commissioners from among residents of the District who had lived there at least five years and one engineer commissioner from among the army engineer corps above the rank of captain. The first commissioners would serve two, four and six years, but subsequent commissioners six years. Their salaries would be $5,000 a year.

Decision Deferred.—The decision of the board of arbitration on wages and working conditions on the Springfield Street Railway and Worcester Consolidated Street Railway systems has been deferred. It was stated that a report might be made during the week beginning Feb. 26. The illness of Bentley W. Warren, representing the companies, hindered progress for a time. Testimony in the case was completed a short time ago, but numerous conferences have been found necessary before a decision could be made. The carmen are represented on the board by James H. Vahey, and the neutral member is James J. Storrow. The decision is understood to be binding on both sides.

Won't Oust Railway. — Prosecuting Attorney Walter H. Ruff, of Stark County failed in the Supreme Court to oust the Northern Ohio Traction & Light Company, Akron, Ohio, from its franchise granting it the right to to operate between Canton and Massillon. The company, maintaining a single track between the two cities sought from the county commissioners in 1919 a franchise for double track, agreeing to pay $75,000 in three installments, the last to be paid July, 1922. None of this money having been paid and no work on the project started by the company, the prosecuting attorney sought to oust the company. The Supreme Court refused to grant the ouster.

No Metric System Referendum.—No referendum on the adoption of the metric system in the United States will be taken at the present time, according to a resolution passed by the National Council of the Chamber of Commerce. The resolution against a referendum was passed at the meeting held in Washington recently. Edmund D. Fisher, chairman of the Chamber of Commerce committee on metric system explained that the committee is nearly equally divided on the question of the metric system itself, but is unanimous that it should go to referendum. George B. Chandler of the Connecticut Chamber of Commerce called attention to the fact that of all those who supported the metric system there was only one representative of industry. This statement noticeably influenced the Chamber of Commerce.

O'Shaughnessy Plan Recommended.—The plan of M. M. O'Shaughnessy, city engineer of San Francisco, Cal., for the extension of the San Francisco municipal railway lines into the Sunset district at a cost of $2,467,000, was recommended to the Board of Supervisors recently by its public utilities committee. The plan includes the construction of a tunnel under Buena Vista Park at a cost of $1,900,000. The board has already voted $500,000 for track extensions. Since last October, when the O'Shaughnessy plan was presented, the public utilities committee of the Board of Supervisors has been holding hearings on the proposed extension. Residents of the Sunset district have opposed the plan. The details of Mr. O'Shaughnessy's proposal were outlined in the ELECTRIC RAILWAY JOURNAL for Oct. 18, 1921, page 662.

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Financial and Corporate

$1,314,853 Increase in Balance of North American Company

The North American Company, New York, N. Y., in its annual report for the twelve months ended Dec. 31, 1921, shows a surplus available for dividends amounting to $6,711,142, compared with $5,396,289 in 1920. This is sufficient to pay a year's dividends on the outstanding preferred stock and to leave a balance equal to $19.35 a share on the outstanding common stock, against $15.11 in 1920 figured on the same basis.

Details of the year's operations last year compared with 1920 are shown as follows:

	1921	1920
Gross earnings	$38,853,190	$39,611,162
Operating expenses and taxes	26,791,256	30,110,350
Net income	$12,061,934	$9,500,812
Other income	307,196	208,673
Total income	$12,369,130	$9,709,485
Interest charges	4,603,114	3,459,305
Pfd. divs. sub. cos.,	684,565	525,906
Minority interest in Wisconsin group	370,309	327,986
Total deductions	$5,657,988	$3,313,197
Balance for depreciation divs., etc.	$6,711,142	$5,396,288

The report points out that of the total gross earnings for the year 25.19 per cent was derived from railway, 58.39 per cent from electric and heating, 5.68 per cent from gas and 10.74 per cent from coal operations. Of the total of $12,061,934 of net income 15.39 per cent was derived from railway, 75.20 per cent from electric and heating, 5.31 per cent from gas and 4.10 per cent from coal operations.

Investment in property and plant of subsidiary companies on Dec. 31, 1921, was $129,218,529, an increase for the year of $9,714,095.

Mention is made in the report of the increase in the capital stock during the year and the creation of a new issue of preferred shares, the par value of the old stock being reduced from $100 to $50 a share for both the preferred and common stocks. An offer was made in December to common stockholders to subscribe to additional stock amounting to $10,422,400 par value.

Plea to Have Boston "L" Bonds Made Legal for Savings Banks

Application has been made to the Massachusetts Legislature by James F. Jackson, chairman of the board of trustees of the Boston (Mass.) Elevated Railway to have the company's bonds declared legal for savings banks investments in Massachusetts. Under the present law the bonds do not come within the classification under the law which requires dividend payments of at least 5 per cent per annum over five consecutive years.

Chairman Jackson told the committee his company requires a large amount of money for new car shops and needed $3,000,000 to build and equip the buildings. It could save $350,000 of that sum by building now, he said, and if the necessary legislation could be secured, by making its bonds legal for savings banks it would tend to ease money conditions and he believed that the banks would invest in the bonds.

United Gas & Electric Reports Net Gain of $536,845

The United Gas & Electric Corporation, New York, N. Y., for the twelve months ended Dec. 31, 1921, earned the equivalent of $8.28 a share on its $9,284,000 first preferred stock, without taking into account the large earning accruing from its oil properties, which on Oct. 31 last showed a net after charges and depreciation amounting to $1,354,832.

While the gross earnings of the company's subsidiaries increased from $11,445,925 in 1920 to $11,898,645, a gain of $452,720, its net after taxes increased from $3,252,387 to $3,789,233, or $536,845. Earnings of the properties in December, 1921, were very satisfactory.

Reorganization Plan Approved by Commission

Another Step Taken at Pittsburgh Toward Rehabilitation of Traction Service There Under an Agreement With City Covering Operation for a Period of Ten Years

The Public Service Commission of Pennsylvania approved the agreement between the city of Pittsburgh and the Philadelphia Company for the reorganization of the Pittsburgh Railways. It is expected that other municipalities and boroughs surrounding Pittsburgh will now enter into a similar agreement. The city's agreement covers the operation of the railway system for a period of ten years.

The commission's decision stipulates that the "program must be effectuated" by Sept. 1, 1922. It also extends from March 1, 1922, to June 1, 1922, the time within which other municipalities joining in the agreement may select their representative on the traction conference board.

The agreement approved provides that the Philadelphia Company must proceed at once to reorganize the railways company or form a new company to take over the old company and convert all present mortgages into a single mortgage on the entire property of the company.

It is provided that the agreement shall not become binding until $5,000,000 is borrowed in the Pittsburgh district to be spent for "betterments, improvements and rehabilitation of the street railway system, subject to the approval of traction conference board."

Within the next thirty days the Philadelphia Company and the Pittsburgh Railways must take the steps necessary to have the receivers of the railways discharged at an early date and the property of the company returned to the re-organized or the new company.

A. W. Thompson, president of the Philadelphia Company, in a statement which he issued, said in part:

> All municipalities interested in the traction problem should, we believe, go along with Pittsburgh and immediately take steps to execute similar agreements with the company so that they may co-operate in the advantages of the plan.
>
> The new organization must raise $5,000,000 in the Pittsburgh district before this plan becomes operative.
>
> Whether or not it can raise the money depends entirely upon the citizens of the Pittsburgh district. If they will lend their support to the raising of this new money in the same way that they have supported the negotiations of the city, which resulted in a contract for the reorganization, the financing of this large sum of money is assured.
>
> As soon as the $5,000,000 is raised, the new organization will be in a position to purchase much needed new cars and immediately make improvements in the service.

The agreements provide that the company shall be allowed an annual net return of $3,750,000 on the public service commission's $62,500,000 valuation, of the company's property. This is at the rate of 6 per cent. In addition, the company is to be allowed the amount of money necessary to cover all operating expenses.

As to fares, the agreement says that if, at the end of any quarter, there is a surplus of "such amount as, in the opinion of the majority of the traction conference board would justify a reduction in the car fare," the city or any other municipality in the agreement shall have the right to apply to the Public Service Commission for a reduction in fare sufficient to eliminate the surplus, without objection on the part of the company. It is also provided that if it becomes necessary to increase fares at any time to meet requirements the company can make application for the increase without objection by the city or any other municipality in the agreement.

Persons holding claims or judgments against the company for personal injuries or death, sustained prior to the appointment of the receivers, the agreement provides during the next thirty days must agree in writing to accept payment, without interest, in annual instalments spread over a period of ten years, the first payment to be made within two years.

The new company agrees to assume claims arising during the régime of the receivers which may be ordered paid by the federal court having charge of the accounts of the receivers.

In lieu of the past system of the city and the company dividing the cost of repaving the streets carrying railway

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tracks the company agrees to pay a lump sum of $200,000 to the city yearly.

The company is to pay the city $100,000 annually in lieu of present agreements to pay various bridge tolls, street cleaning expenses and certain license taxes.

It is provided that the traction conference board shall consist of four members, two to be appointed by the Mayor with the consent of Council; one by the joint action of municipalities signing identical agreements with the company and one to be appointed by the company. The agreement says that in the event of other municipalities failing to select their representative by March 1, 1922, three members of the board shall be selected by the city of Pittsburgh. This provision is changed by the finding of the commission extending the time limit for other municipalities to June 1.

The salaries of the members and all expenses of the board are not to exceed $50,000 a year, the money to be paid by the company.

The details regarding the powers of the traction conference board have been published in detail previously. Briefly, the board is to supervise and control the expenditures of the company and in the event of either the city or the company not being satisfied with its decision, there is a provision for arbitration.

Another Step Taken Toward Spokane Consolidation

Advices from Spokane, Wash., indicate that an impediment has been removed that has blocked the negotiations for the consolidation of the railway lines of the Washington Water Power Company and the Traction system, and that the negotiations are immediately to be resumed. To effect consolidation it was found necessary for the Washington Water Power Company to take its car lines out from under its general mortgage and this required negotiations with financial interests in New York.

Efforts will be made to complete the details of consolidation so the matter may be submitted to the people at a special election on May 2 next. This will require preparing amendments to the city charter to modify the present franchise requirements, the circulation of a petition calling the election and the publication of the necessary election notices.

$254,339 Increase in Balance Available for Dividends in Louisville

The total revenue of the Louisville (Ky.) Railway was $4,469,502 in the year, as compared to $4,146,507 in 1920, and that of the Louisville Interurban $96,762 in 1921 compared with $126,930 in 1920.

The gross income of the two companies was $929,541, compared to $678,250. the year before. This is figured by deducting from the income the expenses of operations and taxes. Over $638,000 of the gross income was used to pay interest on notes and bonds, leaving the balance available for dividends $290,592. as compared with $36,253 the previous year. These and other facts were presented to the stockholders at the annual meeting on Feb. 15.

COMPARATIVE INCOME STATEMENT

	1921	1920
Revenue from transportation	$4,275,434	$3,962,206
Other operating revenues	194,067	184,300
Total operating revenues	$4,469,502	$4,146,507
Operating expenses	3,273,722	3,229,187
Net revenue from operations	$1,195,779	$ 917,319
Taxes	363,000	366,000
Operating income	$ 832,779	$ 555,319
Non-operating income:		
Louisville & Interurban Railroad net income	$ 87,884	$ 124,255
Other non-operating income	8,877	2,675
Total non-operating income	$ 96,762	$ 126,930
Gross income	$ 929,541	$ 678,250
Deductions from gross income:		
Interest on bonds and notes	$ 633,079	$ 632,790
Amortization of discount on notes	5,103	9,207
Miscellaneous debits	765	.....
Total deductions	$ 638,948	$ 641,997
Balance available for dividends on stock	$ 290,592	$ 36,253

Another feature of the report which pleased the stockholders was the record of accident prevention. The cost of accident settlements fell from 6.4 per cent of the gross income in 1920 to 3½ per cent last year.

Mr. Barnes reviewed the litigation and said that the appraisal of the properties of the company by engineering experts valued it at more than $29,000,000. He told of the work of the Co-operative Welfare Association, the agreement of the employees to accept a reduction in wages and the election of D. L. Kehl, of the way department, to the board of directors.

The results of the operation for the year are shown in the accompaning income statement.

Application Made to Prevent Sale of American Cities Company Collateral

Application for an injunction was filed on Feb. 16 in the Civil District Court of Orleans parish by William J. Behen, Joseph Blum, J. C. LeBourgeois and Duralde Claiborne, representing, it is presumed, the committee of preferred shareholders of the American Cities Company opposed to the reorganization plan for that company. The action was brought against J. K. Newman, Lynn Dinkins and Archibald C. Kains, individually, and Messrs. Newman and Dinkins as members of the board of directors of the American Cities Company. It is sought to restrain the committee jointly with the Whitney Central Trust & Savings Bank, New Orleans, as trustee, from proceeding with the sale of certain securities in New York on Feb. 23. These securities it is alleged had been pledged as security for the eight-year 6 per cent collateral trust bonds issued by the American Cities Company in 1911.

The bonds issued by the American Cities Company in 1911 aggregated $10,000,000 and the collateral pledged for the issue consisted of securities of utilities companies in New Orleans and other southern cities. It had been alleged by the bondholders that the American Cities Company had defaulted not only in interest but on the principal, and the securities were ordered to be sold. The sale of the securities, it is alleged, would bring not much more than $12,000,000.

It is further alleged that a plan had been worked out in conjunction with representatives of the bondholders to effect the reorganization, which, if consummated, "would cause the plantiffs herein, as well as all the other holders of the common and preferred stock, to lose their entire investment, amounting to more than $30,000,000."

Conspectus of Indexes for February, 1922

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	Feb. 1922 **7.16**	Jan. 1922 **7.20**	Feb. 1921 **7.20**	May 1921 **7.24**	**4.84**
Street Railway Materials*	Jan. 1922 **157**	Dec. 1921 **159**	Jan. 1921 **202**	Sept. 1920 **247**	**100**
Street Railway Wages*	Feb. 1922 **214**	Jan. 1922 **215**	Feb. 1921 **232**	Sept. 1920 **232**	**100**
Steel Unfilled orders (Million tons)	Jan. 31 1922 **4.24**	Dec. 31 1921 **4.27**	Jan. 31 1921 **7.57**	Apr. 30 1917 **12.18**	**5.91**
U.S. Bank Clearings Outside N. Y. City (Billions)	Jan. 1922 **11.58**	Dec. 1921 **12.99**	Jan. 1921 **12.92**	March 1920 **18.54**	Av. Mo. 1913 **6.12**
Business Failures Number	Jan. 1922 **2,705**	Dec. 1921 **2,380**	Jan. 1921 **1,998**	Jan. 1922 **2,705**	1913 **1,213**
Liabilities (millions)	**115.3**	**76.34**	**74.95**	**115.3**	**24.64**

	Latest	Month Ago	Year Ago	Peak	1913
U.S. Bur. Lab. Stat. Wholesale Commodities	Jan. 1922 **148**	Dec. 1921 **149**	Jan. 1921 **177**	May 1920 **272**	**100**
Bradstreet's Wholesale Commodities	Feb. 1 1922 **11.42**	Jan. 1 1922 **11.37**	Feb. 1 1921 **12.37**	Feb. 1 1920 **20.87**	**9.21**
Dun's Wholesale Commodities	Feb. 1 1922 **165.0**	Jan. 1 1922 **164.4**	Feb. 1 1921 **185.8**	May 1 1920 **263.3**	**120.9**
Annalist Wholesale food	Feb. 18 1922 **173.2**	Jan. 21 1922 **164.3**	Feb. 19 1921 **185.1**	June 12 1920 **329.2**	**140**
U.S. Bur. Lab. Stat. Retail food	Jan. 1922 **142**	Dec. 1921 **150**	Jan. 1921 **172**	June 1920 **219**	**100**
Nat. Ind. Conf. Bd. Cost of living	Feb. 1 1922 **157.7**	Jan. 1 1922 **161.4**	Feb. 1 1921 **176.3**	July 1 1920 **204.5**	(1914) **100**

*Computed by Mr. Richey.

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The Opening Gun in New York Railway Valuation

Transit Commission Valuation Bureau Recommends Net Valuation of $465,680,154, Which Is About 60 per Cent of the Par Value of Outstanding Securities, Less than 60 per Cent of the Book Value and Less than Half of the Total Capitalization—Valuation Hearings to Commence March 6

THE valuation of the New York City traction lines recommended to the Transit Commission by its Bureau of Valuation, announced on Monday of this week, brought forth reactions which varied all the way from the reported statement of a traction official, "Thank God, there are still courts," to that of the city's corporation counsel, John P. O'Brien, who said it is "grossly excessive by many millions of dollars." The figure recommended by John H. Madden, valuation engineer, and Fred W. Lindars, chief accountant, is $465,680,154 as the net valuation to be placed on the properties of the forty transit companies proposed for inclusion in the commission's plan of reorganization. This figure does not include non-operating property, which the Bureau of Valuation considers to be worth something over $20,000,000.

This value is to be compared with a total capitalization of $1,123,885,592; with a book value, representing the companies' own valuation, of $791,450,841; with a par value of the securities held by the public of $765,094,365 (the difference between this and the capitalization represents various company holdings which the commission's Bureau of Valuation has excluded from consideration); and with a market value of the securities held by the public of $426,060,095 as of Feb. 1, 1922, but with the following securities on which market quotations could not be secured —$25.236,429 held by the public and $158,481,099 held by the companies, par value in both cases.

The figure recommended by the bureau is only one of four presented. This one is based on what the bureau calls "original costs," but which is really an appraised value based on prices at the time of installation. From the total value thus obtained the bureau has subtracted something over $55,000,000, which is the estimated expenditure necessary to place the property in first-class operating condition, and thus obtains the $465,680,154 which it recommends as the net valuation. The other three figures presented are:

1. Original cost (appraised value as above described), less straight line depreciation... $425,360,145
2. Appraised value, 1910-1914 prices, less depreciation..... 437,724,313
3. Appraised value, 1921 prices less depreciation 571,048,271

Accompanying tables show details of the bureau's valuation upon which it bases its recommendation as to net valuation; also, the details of the various bases of valuation as applied to the different companies and also a summary statement of the securities outstanding against the various companies with their market value. These tables tell most of the story as to the conclusions which the Bureau of Valuation reaches. They are gathered together from the first volume of the report of the Bureau of Valuation, which volume in itself resembles, as one person has stated, a book of wallpaper samples in its size. Table after table, unending masses of data and statistics, are presented by the bureau to indicate not only its conclusions but also the prices and statistics upon which these conclusions are based.

There is still to be prepared a fifth set of figures showing the estimated future earning capacity of each of the railroads, upon the basis of the 5-cent fare and present conditions of management. The transit act requires that due regard shall be given to such an estimate in fixing the figures at which the properties will be taken over. The commission has expressed the opinion, however, that this set of figures will not materially change the aggregate allowance.

The Significance of the Valuation Figures

The figures here presented are, of course, the report of the Bureau of Valuation to the Transit Commission on the value of the physical property. This report has been handed to all of the several companies affected, to the various groups of security holders, to the city officials and to others interested, and a series of hearings will be held, commencing March 6, for the presentation of other facts and arguments, after which the commission will make its decision as to the valuation of the properties. This decision, Chairman McAneny announced, will be included as a part of the general and final recommendations of the Transit Commission as to a rehabilitation plan in New York City and not before.

Whatever valuation is finally adopted, however, will be the amount which will be allowed to the companies in new securities of a general holding or owning and operating company, in which all of the lines will be gathered together.

If the recommendation of the Bureau of Valuation is accepted, it will mean that the companies will be allowed in the new securities only the amount of money which the Bureau of Valuation estimates has been expended in actual construction of the properties. The exact plan, Chairman McAneny announced on Monday, is as follows:

It will be proposed to the companies that they vest title to their several properties in the city; that the consideration of these transfers shall be the issuance to them in return of an equivalent of value in the securities of the new controlling company that is to be brought into existence under the plan, and that the further consideration shall be that the several individual companies that are to be brought within a unified system and grouped in the manner the commission has proposed shall receive back new leases, under which they will continue to operate privately, but under the terms, financial and otherwise, fixed by the plan and under the general direction of the proposed Board of Control. It is not proposed, in short, that the acquisition of the properties by the city shall be upon the basis of payment in cash. The new securities, properly guaranteed, will provide the sole basis of exchange, and the valuations have been required to be made in order to determine the amount of such securities that will go to each company. Each company in turn accepting the plan will be required to take care of its own old securities of whatever value, whatever extent, in its own way, and through a reallotment to the old holders of the new bonds.

Commissioner McAneny then proceeded to say that the report of the bureau presented at the hearing had been made public as soon as received by the commission with a view toward acquainting all who are interested with its contents and to afford to each as much time as possible for a preliminary study of its recommendations before fixing the date for a general public hearing.

Most of the hearing on Monday was taken up with an examination of Valuation Engineer John H. Madden by Judge Shearn, counsel to the commission. Mr. Shearn desired to establish by the testimony of Mr. Madden the manner in which the valuation estimates had been prepared. In addition to the volume of tables and statistics already mentioned, Mr. Madden presented three other volumes:

1. A report of the cost of the Manhattan Railroad extension, and additional track authorized by the certificate granted to the Interborough Rapid Transit Company for elevated extension and certificate granted to the Manhattan Railway Company for additional tracks dated March 19, 1913.

2. The determination of the chief engineer under the contract dated March 19, 1913, between the city and the Interborough company of the cost paid or accrued to March 31, 1921, of Contract No. 3, together with the report of the cost of operation to the same date.

3. The determination of the chief engineer under the contract dated March 19, 1913, between the city and the New York Municipal Railway Corporation, known as Contract No. 4, of the cost paid or accrued to March 31, 1921, together with the report of the cost of operation to the same date.

Mr. Madden testified that his "original cost" figure was really an appraised value, using prices as of date of installation in so far as obtainable, but checked against company records when they were available. In this connection he said that he had been given free access to all company records available.

He further indicated that he had used the "yard-stick" method of valuation in that typical sections of structures had been selected and applied to the stretches to which these typical sections pertained.

Franchise, going value and value of all leases were not considered in arriving at the final figure.

Mr. Madden also gave his argument as to why he thought the original cost

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RAPID TRANSIT AND SURFACE RAILROADS—NEW YORK CITY

SUMMARY COLLECTED FROM TABLES IN REPORT OF BUREAU OF VALUATION TO THE TRANSIT COMMISSION SHOWING CAPITALIZATION RECOGNIZED BY THE BUREAU (COMPANY HOLDINGS OF SECURITIES BEING ELIMINATED), BOOK VALUES OF PHYSICAL PROPERTY, AND VALUES ASSIGNED BY THE BUREAU IN ITS RECOMMENDATIONS.

Name of System or Company	Capital Stock, Funded Indebtedness, etc., as at June 30, 1921(a)	Gross Book Values of Fixed Capital Assets, Including Materials and Supplies, June 30, 1921	Appraised Value Based on Prices as of Date of Construction Including Both Operating and Non-operating Property	Appraised Value Based on Prices as of Date of Construction, Operating Property Only	Expenditures Necessary to Place Property in First Class Operating Condition	Net valuation recommended, Operating Property Only—Appraised Value Based on Prices as of Date of Construction Less Expenditures Necessary to Place Property in First Class Operating Condition
Brooklyn Rapid Transit System						
Brooklyn Rapid Transit Surface Lines						
Brooklyn Heights Railroad Company		$13,506,443.05	$810,357	$769,582	$85,469	$684,113
Bridge Operating Company		100,734.55	.....	.....	.....	.....
Bklyn, Queens County and Suburban R. R. Co		11,431,567.20	4,878,536	4,474,045	1,122,849	3,351,196
Coney Island and Brooklyn R. R. Co.—owned and leased lines		9,611,765.53	6,515,342	5,525,989	1,354,121	4,171,868
Nassau Electric Railroad Co.		34,867,625.76	12,254,156	11,540,755	3,313,216	8,227,539
Brooklyn Rapid Transit Company		17,204,212.99	24,119,528	23,654,969	2,048,553	21,606,416
Total Receivership Companies—surface lines		86,722,349.08	48,577,919	45,965,340	7,924,208	38,041,132
Brooklyn City Railroad Company		19,837,534.41	21,290,292	20,431,352	4,843,508	15,587,844
Coney Island and Gravesend Railway Company		251,479.62	446,112	446,112	75,614	370,498
South Brooklyn Ry. Co.—owned and leased lines		4,031,189.08	5,159,603	5,086,153	573,868	4,512,285
Total B. R. T. surface lines		110,842,552.19	75,473,926	71,928,957	13,417,198	58,511,759
Brooklyn Rapid Transit Elevated and Subway Lines						
New York Consolidated R. R. Co.—Original property		58,497,742.45	25,927,194	24,761,992	2,357,117	22,404,875
New York Municipal Railway Corporation						
Contract 4—construction and equipment			41,672,294	41,672,294	(k) 1,230,918	40,441,376
Reconstruction of existing railroad			19,302,186	19,302,186	(k) 75,262	19,226,924
Additional tracks			8,194,726	8,194,726	(k) 13,659	8,181,067
Elevated extensions			5,161,567	5,161,567	(k) 10,696	5,150,871
Undistributed costs			691,805	691,805	.....	691,805
Total N. Y. Municipal Railway Corp.		$78,650,983.73	$75,022,578	$75,022,578	(k) $1,330,535	$73,692,043
Total B. R. T. elevated and subway lines		$137,148,726.18	$100,949,772	$99,784,570	$3,687,652	$96,096,918
Grand total Brooklyn Rapid Transit System	(b) $232,175,073.64	$247,991,278.37	$176,423,698	$171,713,527	$17,104,850	$154,608,677
Interborough Rapid Transit System—Subway and Elevated Lines						
I. R. T. Company—Contracts 1 and 2, subway		$57,204,245.58	$43,898,479	$43,898,479	(k) $7,887,251	$36,011,228
I. R. T. Company—contract 3, subway		108,473,910.16	101,483,864	101,483,864	(k) 1,825,537	99,658,327
Total I. R. T. Company Subways		$165,678,155.74	$145,382,343	$145,382,343	(k) $9,712,788	$135,669,555
I. R. T. Company—elevated lines	$235,250,400.00	$21,386,607.89	$21,239,406	$21,239,406	(k) $35,617	$21,203,789
Additional tracks		13,082,856.70	12,963,265	12,963,265	(k) 509,430	12,453,835
Elevated extensions		5,633,129.78	5,642,679	5,642,679	(k) 1,011,297	4,631,382
Manhattan Power Plant Improvements		5,633,129.78	5,642,679	5,642,679	(k) 1,011,297	4,631,382
Additions to Existing Manhattan Railroad		264,627.91	264,627	264,627	(k) 2,132	262,495
Total I. R. T. Company—elevated lines		$40,367,222.28	$40,109,977	$40,109,977	(k) $1,[illegible]	$38,551,501
Manhattan Ry. Co.—Original Elevated Property	(c) $105,199,439.02	$113,001,414.41	$64,019,835	$62,417,138	$5,042,933	$57,374,205
Total I. R. T.—Manhattan Ry. elevated lines		$153,368,636.69	$104,129,812	$102,527,115	$6,601,409	$95,925,706
Grand total I. R. T. System—subway and elevated lines	$340,449,839.02	$319,046,792.43	$249,512,155	$247,909,458	$16,314,197	$231,595,261
New York Railways System						
New York Railways Co.—owned lines		$76,266,487.80	.....	(l)	$4,382,009	.....
New York Railways Co.—leased lines		30,852,556.83	.....	(l)	4,603,254	.....
Total New York Railways Company	(d) $990,380,445.19	$107,119,044.63	$44,334,048	$35,068,875	(m) $12,401,773	$22,667,102
Eighth Avenue Railroad Company	1,636,200.00	6,475,762.12	4,702,524	3,910,766	1,105,843	2,804,923
Ninth Avenue Railroad Company	800,000.00	3,171,331.33	2,373,571	2,373,571	197,365	2,176,206
New York and Harlem Railroad Company	(e) 2,850,544.00	(e) 2,317,468.26	3,695,499	3,695,499	1,471,945	2,223,554
Total New York Railways System	$95,667,189.19	$119,083,606.34	$55,105,642	$45,048,711	$15,176,926	$29,871,785
Third Ave. Railway System						
Third Ave. Railway Company		$34,887,093.56	$21,002,994	$20,100,654	$2,362,223	$17,738,431
Kingsbridge Railway Company		2,276,168.17	1,060,305	1,060,305	26,500	1,033,805
Third Ave. Bridge Company		113,108.64	.....	.....	.....	.....
Belt Line Railway Corporation		1,965,269.88	1,849,064	1,831,559	81,978	1,749,581
Dry Dock, East Broadway and Battery Railroad Company		4,343,090.91	2,678,168	1,966,279	242,250	1,724,029
42nd Street Manhattanville and St. Nicholas Ave. Ry. Co.		12,573,533.15	3,761,821	2,988,132	429,633	2,558,499
New York City Interborough Railway Co.		7,049,124.48	1,954,093	1,954,093	216,359	1,737,734
Southern Boulevard Railroad Company		707,232.60	428,097	428,097	16,800	411,297
Union Railway Company		9,840,898.48	6,966,802	6,874,577	599,263	6,275,314
Bronx Traction Company		702,858.81	854,044	854,044	31,200	822,844
Mid-Crosstown Railway Company		161,063.48	185,446	185,446	366,700	(D) 181,254
Pelham Park and City Island Railway Co.		82,789.64	101,650	101,650	4,500	97,150
Total—Third Avenue Railway System	(f) $68,599,961.25	$74,702,231.80	$40,842,484	$38,344,836	$4,377,406	$33,967,430
Second Avenue Railroad Company	(g) 10,722,000.00	(g) $8,308,443.29	$5,404,882	$5,320,882	$522,565	$4,798,317
Staten Island Companies						
Richmond Light and Railroad Companies	(j) $1,342,756.94	(j) $3,055,622.41	$3,607,622	$3,553,915	$430,972	$3,122,943
Southfield Beach Railroad Company	249,800.00	301,813.12	.....			
Staten Island Midland Railway Company	2,000,000.00	2,341,642.46	925,165	856,467	170,973	1,092,770
Dept. of Plant and Structures, New York City	262,959.65	3,591.98	407,276	407,276	.....	.....
Total—Staten Island Companies	$3,855,516.59	$5,702,669.97	$4,940,063	$4,817,658	$601,945	$4,215,713

(Table continued on next page)

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(*Table continued from page* 334)

Name of System or Company	Capital Stock, Funded Indebtedness, etc., as at June 30, 1921 (*a*)	Gross Book Values of Fixed Capital Assets, Including Materials and Supplies, June 30, 1921	Appraised Value Based on Prices as of Date of Construction Including Both Operating and Non-operating Property	Appraised Value Based on Prices as of Date of Construction, Operating Property Only	Expenditures Necessary to Place Property in First Class Operating Condition	Net Valuation Recommended, Operating Property Only—Appraised Value Based on Prices as of Date of Construction Less Expenditures Necessary to Place Property in First Class Operating Condition
Queens Borough Companies						
New York and Queens County Railway Co....	$6,235,000.00	$8,922,229.48	$4,962,366	$4,739,055	$781,673	$3,957,382
Long Island Electric Railway Company.....	1,200,000.00	1,617,590.31	725,209	725,209	213,531	511,678
New York and Long Island Traction Company	2,000,000.00	2,472,803.92	826,497	619,996	163,425	456,571
Ocean Electric Railway Company.....	354,288.69	512,061.16	372,270	372,270	103,300	268,970
Manhattan and Queens Traction Corporation.	(*h*) 1,431,647.34	690,692.72	1,125,824	1,125,824	239,831	885,993
New York and North Shore Traction Company	(*i*) 1,753,850.00	1,642,379.94	824,545	171,382	126,212	45,170
Total—Queens Borough Companies.....	$12,974,786.03	$15,857,757.53	$8,836,711	$7,753,736	$1,627,972	$6,125,764
Miscellaneous Companies						
Manhattan Bridge Three Cent Line.....	$450,000.00	$485,964.25	$353,861	$353,861	$41,716	$312,145
Van Brunt Street and Erie Basin Railroad Co..	200,000.00	272,097.11	218,622	218,622	33,560	185,062
Total—Miscellaneous Companies.....	$650,000.00	$758,061.36	$572,483	$572,483	$75,276	$497,207
Grand Total—all companies.....	$765,094,365.72	$791,450,841.09	$541,638,118	$521,481,291	(*n*) $55,801,137	**$465,680,154**
City's Investment—Subways						
Contracts 1 and 2 (I. R. T.).....	.....	.....	$62,767,713	$62,767,713	(*k*) $91,657	$62,676,056
Contract 3 (I. R. T.).....	.....	.....	88,086,508	88,086,508	(*k*) 27,517	88,058,991
Contract 4 (B. R. T.).....	.....	.....	142,801,094	142,801,094	(*k*) 42,902	142,758,192
Total—City.....	.....	.....	$293,655,315	$293,655,315	(*k*) $162,076	$293,493,239
Combined Total—companies and city.....			$835,293,433	$815,136,606	(*o*) $55,963,213	$759,173,393

NOTES:—(*a*) Includes capital stock, bonded debt, certificates of indebtedness, receiver's certificates and construction advances.
(*b*) Excludes bonds $103,106,316, stocks $39,325,632, certificates and construction advances $42,279,388—held among system companies.
(*c*) Excludes acquired bonds $7,560,98.
(*d*) Excludes securities of subsidiary companies held by N. Y. Rys. Co. viz.:—Stocks $7,161,300 and bonds $3,151,342.
(*e*) Arbitrary apportionment to Street Railway Division as made by State Tax Commission.
(*f*) Excludes securities of subsidiary companies held by 3rd Avenue Ry. Co. viz.: Stock $10,276,000, bonds $10,835,339, Const. advances $14,511,785.
(*g*) Combining reports of Receiver and Company and including adjustments conforming with U. S. Circuit Court decisions.
(*h*) Includes Judgment Notes $1,411,647.34 as per Company's annual report.
(*i*) Includes Receiver's certificates $4,500,00 shown in annual report.
(*j*) Excludes lighting department fixed capital and materials and supplies $3,776,493.06 and eliminates bonds and stocks in similar total amount.
(*k*) Represents accrued depreciation.
(*l*) Not separately computed.
(*m*) Includes $20,970 Electrical and Mechanical Equipment and $3,395,540 rolling stock not distributed among the various companies in the New York Railway System.
(*n*) Accrued depreciation, company investment..... $12,601,799
Expenditures necessary to place property in first class condition..... 43,199,338
$55,801,137
(*o*) Accrued depreciation, company investment..... $12,601,799
Accrued depreciation, city investment..... 162,076
Expenditures necessary to place property in first class condition 43,199,338
$55,963,213
(*D*) Negative value.

COMBINED TABLE SHOWING SEVERAL BASES OF VALUATION—OPERATING PROPERTY ONLY—FOR PURPOSES OF COMPARISON

(Another Basis, that of Prospective Earning Power, is still to be reported.)

Name of System or Company	Appraised Value Using Prices as of Date of Construction	Appraised Value Using Prices as of Date of Construction Less Depreciation	Appraised Value 1910-1914 Prices	Appraised Value 1910-1914 Prices, Less Depreciation	Appraised Value 1921 Prices	Appraised Value 1921 Prices, Less Depreciation	Net Valuation Recommended—Appraised Value Using Prices as of Date of Construction Less Expenditures Necessary to Place Property in First Class Operating Condition
Brooklyn Rapid Transit System							
Surface lines (including Brooklyn City Co.).....	$71,928,957	$46,526,562	$80,041,741	$51,066,180	$141,400,157	$86,746,640	$58,511,759
Elevated and subway lines.....	99,784,570	90,635,855	99,666,842	90,432,501	119,734,821	103,182,865	96,096,918
Total B. R. T. System.....	$171,713,527	$137,162,417	$179,708,583	$141,498,681	$261,134,978	$189,929,505	$154,608,677
Interborough Rapid Transit System—Subway and Elevated							
I. R. T. Co. Contramcts Nos. 1, 2 and 3.....	$145,382,343	$135,669,555	$145,382,343	$135,669,555	$145,382,343	$135,669,555	$135,669,555
I. R. T. Co. elevated lines.....	40,109,977	38,551,501	40,109,977	38,551,501	40,109,977	38,551,501	38,551,501
Manhattan railway original elevated property.....	62,417,138	43,293,409	60,128,434	41,924,656	98,970,808	63,805,290	57,374,205
Total I. R. T. and Manhattan elevated lines.....	$102,527,115	$81,844,910	$100,238,411	$80,476,157	$139,080,785	$102,356,791	$95,925,70
Grand total I. R. T. system.....	$247,909,458	$217,514,465	$245,620,754	$216,145,712	$284,463,128	$238,026,346	$231,595,261
New York Railways System (including 8th, 9th and N. Y. & Harlem R. R. Co.).....	$45,048,711	$32,968,506	$50,795,754	$36,952,949	$90,756,522	$64,674,624	$29,871,785
Third Ave. railway system.....	38,344,836	25,618,242	44,357,474	29,456,174	82,095,169	53,817,386	33,967,430
Second Ave. railway company.....	5,320,882	3,737,280	6,577,544	4,539,165	12,788,952	8,805,364	4,798,317
Staten Island companies.....	4,817,658	3,219,323	5,318,521	3,507,445	8,625,192	5,402,727	4,215,713
Queens Borough companies.....	7,753,736	4,698,894	8,582,595	5,198,676	16,266,184	9,676,258	6,125,764
Miscellaneous companies.....	572,483	441,018	570,089	425,511	1,010,475	716,061	497,207
Grand total all companies.....	$521,481,291	$425,360,445	$541,531,314	$437,724,313	$757,140,600	$571,048,271	**$465,680,154**
City's investment subways							
Contracts 1 and 2 (I. R. T.).....	$62,767,713	$62,676,056	$62,767,713	$62,676,056	$62,767,713	$62,676,056	$62,676,056
Contracts 3 (I. R. T.).....	88,086,508	88,058,991	88,086,508	88,058,991	88,086,508	88,058,991	88,058,991
Contracts 4 (B. R. T.).....	142,801,094	142,758,192	142,801,094	142,758,192	142,801,094	142,758,192	142,758,192
Total City.....	$293,655,315	$293,493,239	$293,655,315	$293,493,239	$293,655,315	$293,493,239	$293,493,23
Grand totals, companies and city	$815,136,606	$718,853,384	$835,186,629	$731,217,552	$1,050,795,915	$864,541,510	$759,173,39

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RAPID TRANSIT AND SURFACE RAILROAD COMPANIES — NEW YORK CITY

Summary Statement showing the amount of Capital Stocks, Bonds, Certificates of Indebtedness, etc., outstanding June 30, 1921, the proportions thereof held by the Public and within the Systems respectively, together with the Market Values thereof at September 1, 1921, and with the Market Value of the totals as of Feb. 1, 1922.

	Capital Stocks — Quoted on Market								Bonds and Secured Notes — Quoted on Market											
	Held by Public		Held by System		Total Capital Stocks		Held by Public		Held by System		Total Bonds and Secured Notes				Grand Total Stocks and Bonds					
	Par Value	Market Value	Par Value	Market Value	Par Value	Market Value	Par Value	Market Value	Par Value	Market Value	Par Value	Market Value			Par Value	Market Value (Sept 1, 1921)		Market Value (Feb. 1, 1922)		
Brooklyn R. T. System	$87,138,343	$12,044,036	$18,281,657	$4,560,364	$105,420,000	$16,604,400	$139,426,328	$76,621,864	$90,231,572	$29,166,686	$229,657,900	$105,788,550			$335,077,900	$122,392,950		$149,149,812		
Interborough Con. System	110,403,634	28,338,614			110,403,634	28,338,614	300,609,400	144,457,875	12,660,000	5,154,708	313,269,400	149,612,583			423,673,034	177,951,197		212,868,905		
New York Railways System	9,615,246	6,378,410	17,530,358	306,251	27,145,604	6,684,651	69,081,685	12,416,885	1,041,341	218,682	70,123,026	12,635,567			97,268,630	19,320,228		25,101,972		
Third Avenue Railway System	16,840,000	2,484,812			16,840,000	2,484,812	51,119,000	24,198,500	3,057,300	1,532,300	54,176,500	25,730,800			71,016,500	28,215,612		35,816,175		
Second Ave. R. R. Company							8,771,000	727,831			8,771,000	727,831			8,771,000	727,831		1,261,631		
Manhattan Bridge 3c. Line																				
Staten Island Companies							2,711,000	1,362,600			2,711,000	1,362,600			2,711,000	1,362,600		1,186,600		
Queens County Companies							1,650,000	675,000			1,650,000	675,000			1,650,000	675,000		675,000		
Totals	$223,997,223	$49,245,872	$35,812,015	$4,866,615	$259,809,238	$54,112,487	$573,368,413	$260,460,555	$106,990,413	36,072,376	$680,358,826	$296,532,931			$940,168,064	$350,645,418		$426,060,095		

Capital Stocks, Bonds, etc., on which market quotations could not be secured

	Held by Public	Held by System	Total
Capital Stocks	$12,749,425	$73,427,175	$86,176,600
Bonds and secured notes, etc.	9,645,911	11,202,289	20,848,200
Certificates of indebtedness, receiver's certificates, etc.	2,841,093	73,851,635	76,692,728
	$25,236,429	$158,481,099	$183,717,528

Total capitalization $1,123,885,592

less expenditures necessary to place the property in first-class operating condition was the logical one to adopt.

City's Representative Present

For the first time the city was represented at the hearing by special Assistant Corporation Counsel Mr. DeFord. There was apparently a desire on the part of both Mr. DeFord and the commission to co-operate, so far as the city saw itself legally able to do so, in determining the valuation. Mr. DeFord made it plain, however, that in his appearance he did not waive any contention of the city as to the various points which had been raised as to the constitutionality of the act creating and outlining the activities of the Transit Commission. It was agreed that Mr. DeFord would have ample opportunity to present any objections or testimony which would be pertinent to the determination of the valuation of the properties.

There were very few interested persons who would hazard a comment on the valuation figure presented, every one indicating that the mass of figures presented was so great as to require several days study before an adequate expression could be given.

As was to be expected, however, the city officials decried the figures as being excessive, Mayor Hylan saying, in Palm Beach, Fla., that "it is well known that the purpose of the Transit Commission is to unload if it can at an enormous value the traction junk on the taxpayers of the city. We are preparing, in the interests of the taxpayers, vigorously to oppose this traction scheme." Corporation Counsel J. P. O'Brien said: "This principle is obviously unsound . . . Without attempting at this time to analyze this amount, which is grossly excessive by many millions of dollars, there should be deducted in any event an amount equal to all of the depreciation due to wear and tear, decay and the antiquated character of the plants, structures and equipment."

In transit circles the figures announced apparently were much less than had been expected, as they were far below the values of the different properties as carried on the companies' books. However, no comments from traction representatives could be obtained. All that they would say was that the ten-day period which the commission allowed for examination for the report was all too short. James L. Quackenbush, counsel to the Interborough Rapid Transit Company, said: "I am dizzy from reading figures." He thought it would be at least thirty days before he could be ready to discuss the valuation.

Meanwhile, the commission has set further hearings on the valuation for March 6, at 2 p.m.

Municipal Line Earning Profit

Pekin, not China but Illinois, is doing well with its municipal electric railway. At least James P. St. Cerny, Corporation Counsel of the city, says so, and then he proceeds with facts and figures to prove it. The data with respect to the road in Pekin were furnished by Mr. St. Cerny in reply to a request from another city situated similarly to Pekin with respect to transportation.

The railway at Pekin consists of 3.5 miles of track. The fare is 5 cents, six tickets for 25 cents and during the fiscal year ending April 30, 1921, the receipts of the company amounted to $32,183, enough to pay all running expenses and to make a payment of $8,381.06 on the bonds and interest thereon by which the city originally bought the property for a total of $48,000.

During the years which the city has owned the line, the street railway fund has been able to accumulate a surplus above its current expense and interest charges of $17,255, but nothing had been charged to depreciation and when it became advisable to buy three new cars in 1920 the cost, $17,940, practically wiped out the surplus which had been accumulated. The road pays no taxes, of course, being a municipal plant, and officials feel sure that the profit in operation will more than pay for the depreciation.

The company pays 41½ cents an hour, $110 a month to its motormen, and $120 a month to its superintendent. The total force employed consists of six motormen, one superintendent and a night and a day man at the carhouse, salaries ranging from $80 for the night man to $120 a month for the superintendent. The company buys its electrical power for about $275 a month.

The company uses one-man safety cars, gives a fifteen minute service and has five cars in "active" operation.

Mr. St. Cerny says:

> The city has refunded to the property owners in and along the paved streets, 7 ft. of the pavement, 3½ ft. being returned to each property owner abutting on the line of the improvement which was a term of ordinance and incorporated therein, and was absolutely paid from the earnings of the company.
>
> The city is building a new carhouse that is of modern structure and recently let under contract for construction for $6,646. All of these matters are paid for absolutely in cash, and the city of Pekin has not for the past four years ever made an overdraft on any fund in its departments.
>
> There is one feature of our system that has not been decided upon: that is the question of depreciation. The entire system is new, and the surplus will clearly verify the statement of sufficient funds being accumulated from the earnings to pay all operating and maintenance expenses, and a sufficient sum for depreciation.
>
> The city at the present time contemplates building an extension of the line, to tap a section of the city where the workmen reside. The high prices maintained in the steel market and labor conditions do not warrant the construction of the extension at this time.

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Detroit Surplus $190,444

The annual report of Detroit (Mich.) United Railway for year ended Dec. 31, 1921, shows net income after interest, depreciation and federal taxes, of $865,444, equivalent to $5.62 a share earned on the $15,375,000 capital stock. This compares with net income of $1,233,575, or $8.22 a share on the $15,000,000 stock outstanding in the previous year. The consolidated income account for the year 1921 compares with 1920, as shown in the table above.

	1921	1920
Gross earnings	$23,329,067	$28,986,228
Operating expenses	19,428,779	25,025,165
Net earnings	$3,900,288	$3,961,063
Other income	716,225	676,118
Total income	$4,616,513	$4,637,181
Interest and taxes	3,351,068	3,003,606
Depreciation and fed tax reserves	400,000	400,000
Net income	$865,444	$1,233,575
Dividends	*675,000	1,200,000
Surplus	$190,444	$33,575

*Includes $375,000 paid in stock.

Authorization Given for Local Abandonment

By a recent decision of the Colorado Public Utilities Commission the Trinidad, Electric Transmission, Railway & Gas Company, Trinidad, Col. has received permission to abandon service on certain city lines. The order becomes effective on March 12. The lines to be abandoned are the Baca Street, San Pedro line and the West Main Street branch. Interurban cars only will after March 12 run into the city via Central Park, San Juan Street, and through Pine and Commercial Streets to Main Street.

In November last the company notified the City Council of the financial loss sustained in the operation of these lines and told of its intention to apply to the commission for abandonment permission. The chamber of commerce and City Council opposed the grant. This matter has been referred to previously in ELECTRIC RAILWAY JOURNAL.

Thrift Plans a Huge Success

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has established a high record for thrift among its employees with 86 per cent of them now holding stock in the Employees' Mutual Benefit, Savings, Building & Loan Association. At present 4,387 individuals hold more than 91,000 shares of the stock, making an average holding of 20.9 shares per person. The association now has a capital stock of $10,000,000 and plans to increase this in the near future to $15,000,000.

The association is the most rapidly growing Building & Loan Association in the State of Wisconsin. Money can be left for 6 per cent paid up stock at any time and the stock is taken back again and money refunded upon demand. The Building & Loan Association was started in 1914, and at the close of that year its total assets were about $57,000. Its present assets are almost $3,000,000. There are more than 1,000 mortgage loans now outstanding, totaling $2,780,000. All of these loans were made to employees desiring to buy homes. Two classes of stock are issued by the association. Class A stock requires a payment of 50 cents a share per month and matures in about eleven years. Class C stock requires a payment of $1 a month per share and matures in six or seven years.

Officers of the Building & Loan Association are: G. W. Van Derzee, president; W. F. Lathrop, vice-president; E. J. Evans, secretary; George W. Kalweit, treasurer. In addition to these the following are directors: A. J. Killa, Henry Scheife, Henry Wolf, W. W. Cook and Charles Unrath.

Action for Forfeiture of Franchise Asked

Refusal to comply with the request that he draft an ordinance for forfeiture of the franchise of the Cincinnati (Ohio) Street Railway, held by the Cincinnati Traction Company as a lessee, was contained in a letter sent to Attorney Robert S. Alcorn by Saul Zielonka, City Solicitor. In a letter to the city solicitor recently, Attorney Alcorn demanded that an ordinance be drafted for passage by the City Council to forfeit the franchise held by the traction company. Mr. Zielonka pointed out that a number of the items set forth in Attorney Alcorn's request as causes for forfeiture are now in the courts. The solicitor also calls attention to the fact that the City Council recently enacted a resolution calling for the creation of a citizens' committee to make an exhaustive investigation of the traction situation.

$925,000 Paid for Carhouse Property

At public auction recently, the carhouse properties of the New York (N. Y.) Railways, located on Madison Avenue between Eighty-fifth and Eighty-sixth Streets, were sold for $925,000. M. Turner Brockway was the successful bidder. He intends to construct a family hotel at an estimated cost of between $1,000,000 and $3,000,000.

The sale of the property was conducted in connection with the receivership preceedings instituted by the Guaranty Trust Company and the American Brake & Shoe Foundry Company. If for any reason the sale is set aside, it was announced, the plot would be reoffered on March 16. At the same time the company's property on Thirty-third Street between Lexington and Fourth avenues will be offered for sale.

Notice of Stock Increase Filed

The Gary & Valparaiso Railway, Gary, Ind., has increased its capital stock to $130,000, according to papers filed recently wth the Secretary of State at Indianapolis.

Financial News Notes

Asks to Sell $300,000 of Preferred Stock.—The Indiana & Michigan Electric Company, South Bend, Ind., operating in St. Joseph, Elkhart and other counties in Indiana and Michigan, asked the Indiana Public Service Commission for authority to sell $300,000 of its preferred stock at par to reimburse the company's treasury for expenditures made in improving its plants.

Passenger Traffic Decreases.—For the month of January, 1922, the Philadelphia (Pa.) Rapid Transit Company realized a net income of $234,400 against $162,794 for the same month a year ago. The passenger revenue for the month amounted to $3,363,926 against $3,552,152 in January, 1921. The number of passengers reported as carried by the company decreased from 71,205,892 in January, 1921, to 68,147,370 in January of this year.

Utilities Bear 89 Per Cent of Tax Increase. — According to figures compiled at the offices of the State Tax Commission of Ohio the public utility companies of the State appear to have borne 89 per cent of the increase in Ohio's grand tax duplicate for 1921. It is shown that while the grand tax duplicate for the State was increased $72,378,741, the state tax commission added $64,437,110 of this increase to the total tax valuation of the public utility properties.

Refunding Issue Offered.—Lee. Higginson & Company, Parkinson & Burr and Estabrook & Company, are offering an issue of $1,700,000 of 7 per cent secured gold notes, series "A," of the Galveston-Houston Electric Company, Houston, Tex., dated Feb. 1, 1922, and due Aug. 1, 1925. The proceeds of this sale will be used to refund the outstanding three-year 7 per cent gold notes, due March 1 next, and will provide sufficient working capital for present requirements. The notes are being offered by the banking houses at 99½ to yield about 7.15 per cent.

Hearings on Abandonment Concluded.—Hearings were concluded before the State Public Utilities Commission on Feb. 15 at Columbus, Ohio, on the petition of the Indiana, Columbus and Eastern Traction Company, to abandon its Lima-Defiance, Junction-New Carlisle and Columbus-Orient branches. Among the interests engaged in fighting the petition were the National Refining Company, Cleveland. Protests were based chiefly upon the fact that industries built up along these branch lines would be greatly injured by withdrawal of the service, and that many people living along the lines depended upon the electric railways as operated for some years as their principal means of transportation.

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Traffic and Transportation

Commission Replies to Mr. Stephens

Answers Governor's Letter on California Rate Decision—Must Be Unhampered, It Says

The California State Railroad Commission replied on Feb. 10, to Governor Stephens' recent letter suggesting that it reconsider rate increases granted the Pacific Electric Railway and the Southern Californa Telephone Company. The commission declared that the value of regulation would be destroyed "by even the suspicion that decisions were affected by any other consideration or influences than the real merits."

Conditions Justify Advance

In response to the Governor's letter saying that in view of the general fall in prices a decline in rates might be expected, the commission addressed him a letter stating that conditions justified the advance, the telephone company not having had an increase in five years and the railway having been given only partial relief in the past from higher costs.

The commission's letter considers the case in its broader application when it says:

> Far exceeding in importance any question involved in these particular cases, your letter raises the fundamental issue of regulation established by the people of this State. The success of this system, as you point out, depends on public confidence and understanding. But it equally depends on full freedom under the law to do exact justice, uninfluenced by any other consideration whatsoever. You state that you are concerned for the preservation of regulation of public utilities. A like sense of our own responsibility for regulation impels us to reply that while regulation may be weakened by the temporary or local unpopularity of some decisions, it would be destroyed by even the suspicion that decisions were affected by any consideration or influence other than real merits involved, ascertained after full and careful consideration of all the facts.
>
> Regulatory bodies should not be swerved from doing justice because of public criticism any more than they should be misled by the selfish claims presented by corporations. The Commission desires public approval, but it believes the only way it can secure or retain public approval is by being fair and just. If it must choose between right or being temporarily unpopular, it must choose being right.

Letter Signed by All Commissioners

The commission's letter, signed by all five commissioners H. W. Brunidge, H. D. Loveland, Irving Martin, Chester H. Rowell and H. Stanley Benedict, referred to the growth of public utilities during the last decade of regulation, and in part said:

> During this period the utilities were permitted to earn a fair return and nothing more, but that fair return permitted them to function and to provide necessary service. At the same time every citizen has received additional direct and substantial benefits in lower rates than would have been possible had the present system of regulation not been in effect. No greater disaster could possibly occur in California than to weaken public confidence in regulation.
>
> Your statement that a decline in rates might reasonably be expected with the general fall of prices, is correct, provided rates had previously advanced with advancing costs. In neither of the cases in question was this true. The Pacific Electric had been given partial relief under Federal control. The case of the Pacific Electric has been pending since 1918. If the present rate structure had been put into effect at that time when the justness of the advances was generally conceded, no question of the apparent inconsistency would have arisen.
>
> Instead, at the request of the cities served by the Pacific Electric, the commission made a complete valuation of the property as well as an exhaustive service report.
>
> This appraisal and report required eighteen months to complete. Los Angeles, of course, gained by reason of this long period of deferred reasonable rate adjustments.
>
> The new rates on the Pacific Electric will not provide a single dollar for dividends on stock. The basis on which the rates are computed is $16,000,000 less than the total borrowed money upon which the company must pay interest. The increases allowed the Pacific Electric will not repay any of the losses which this company suffered during the period of low rates. Furthermore, the new rates on the Pacific Electric were made contingent upon the company's spending $2,600,000 new capital for improvement of service. This money has been secured since the decision was issued.

Governor Stephens in his letter to the commission referred to the valuation figures given before the Legislature on the King tax bill by the officials of the Pacific Electric and other great public utility corporations. The commission answered that in this rate proceeding it acted on its own valuation, which was over $20,000,000 less than that claimed by the company in this case.

The reply continues:

> You are, of course, entirely right in your statement that the King tax law had no effect on the Pacific Electric, and was negligible in the case of the telephones rates. This statement the commission has already published in the Los Angeles press.

Regulatory Procedure Adequate

> In all cases this commission must look beyond the mere question of present rates to that of permanent service. In an expanding State like California, service can keep pace with demand only by the constant investment of new capital, but this could not be supplied from earnings except by rates which this commission snould not and does not allow. This outside capital cannot be had unless the companies are permitted to earn enough to pay interest on it, and adequate service cannot be rendered without it. The experience of the two companies now under discussion illustrates the disaster to service which results when inadequate rates are charged.
>
> The policy that has governed in the past is the policy that governs the present commission. So long as we are members of this commission we will be governed by principles of equity and justice and perform our sworn duty regardless of consequences. We propose to fix fair rates—and that means fair both to the rate payers and to the utility—upon established facts uninfluenced by feeling or favorites.
>
> The application for rehearing of the Pacific Electric and telephone cases did not convince the commission that the rates provided in the decisions should be suspended. These rates were made contingent upon the companies spending large amounts of new capital to improve service, and when the companies accepted these conditions, and secured the money for this purpose, it did not appear to be in the interest of the general public to suspend rates.
>
> The members of this commission boldly and confidently assert that no better, fairer or more equitable system than that of regulation as it now exists has been suggested by any person, or, in fact, can be devised.

Weekly Pass for Fort Wayne

Adopted After Careful Study of Results Obtained in Youngstown and Other Cities

The Indiana Service Corporation through its president, Robert M. Feustel, has gained permission from the State Public Service Commission to put into effect a weekly pass system on the Fort Wayne city lines.

The company at Fort Wayne plans on making a six months' trial of the new system, selling the pass for $1. The old system of four checks for 25 cents will still be in effect for those who desire it. The petition calls for starting the plan on or before March 13.

Mr. Feustel stated that the results of the operation of the pass in Racine and Kenosha, Wisconsin, and in Youngstown, Ohio, have been watched very carefully by the transportation department of the company at Fort Wayne. Numerous trips have been made to these cities to obtain the complete data as to the opinion of the public, car operators and the officials of the companies on the use of these passes and it was found that all three of these groups were very enthusiastic about them. In explaining the matter for the benefit of the local public at Fort Wayne Mr. Feustel said:

> The use of these passes in the other cities has greatly speeded up operation. The patron makes only one financial transaction a week with the car operator; no transfers are issued or need to be issued on the pass. This means that the patron merely holds the pass in his hand, shows it to the operator when walking by and because of the distinct color and large identification number of the pass it can be readily identified by the operator. This very materially decreases the time of loading cars and is an important factor in speeding up the service.
>
> Of course the greatest benefit is that it provides a method for giving a lower rate to the frequent rider. Many of our patrons indicated that they rode three or four times daily every week and oftentimes used the cars in the evenings to go to the movies and on Sundays to go to church. The new rate will mean that anyone who rides twenty times weekly gets a 5-cent fare; a 4-cent fare for the party who rides twenty-five times weekly and down as low as a 3½-cent fare for those riding thirty times weekly. The pass being perfectly transferable means that any member of the family can use it, or any friend. The only limitation being that not more than one person can be carried on it at any one time, and it must be used within the week designated on the ticket.
>
> As stated in our letter to the Mayor, this company earned 7.4 per cent on the actual investment in the Fort Wayne city lines in 1921. It is of some interest to note that when the 7-cent fare case was tried in February, 1921, the city's experts estimated that the company would make a net revenue of $309,000, while the company estimated that it would make a net revenue of $224,000. The actual net revenue for 1921 was $214,000. Both, the company and the city's experts overestimated the amount of revenue which would be obtained in 1921. The company's estimate as to the actual net after operating expenses were paid was within $10,000 of the actual results. Unfortunately the company was also over optimistic in its estimates, as the net was $10,000 below what it expected the year's business would yield, while the actual net revenue was $95,000 below what the city estimated.
>
> This reduction in fare is, as stated, aimed to stimulate business in order that we may get this property up to and keep it at a full 8 per cent return. This rate will be needed if we are to keep up with the expansion of the city, and the consequent needs for new capital.
>
> It is our belief that the Fort Wayne city lines are on the right road and if we can get enough double track to operate our cars frequently with the new rates, we can put the Fort Wayne system up to what everybody in the city wants it to be—the best system in the country in any city the size of Fort Wayne.

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Connecticut Experiment Continued

Figures of Results in Norwalk and Bridgeport With Five-Cent Fare Are Tabulated

Although the ninety-day period allowed by the Public Utilities Commission at Hartford, Conn., for the 5-cent fare experiment on the lines of the Connecticut Company in Norwalk expired on Feb. 6 and the same period allowed for the Bridgeport division expired on Feb. 20, the experiment will probably be continued throughout the month, at least, according to a statement of Chairman Higgins, of the Public Utilities Commission. It is also probable that the decisions of the commission regulating fares on both divisions will be handed down at the same time, according to Chairman Higgins. At the time the experiments were started the Public Utilities Commission reserved the right to continue them beyond the three months period if it saw fit.

Bridgeport

	Receipts.	Decrease.
Nov. 26	$32,799.69	$6,461.89
Dec. 3	34,156.29	5,105.29
Dec. 10	34,829.31	4,432.27
Dec. 17	36,177.36	3,084.22
Dec. 24	38.747.98	513.60
Dec. 31	36,121.18	3,140.40
Jan. 7	36,666.43	2,595.15
Jan. 14	37,028.87	2,232.71
Jan. 21	36,376.72	2,884.86
Jan. 28	36,146.43	3,115.15
Feb. 4	35,480.43	3,781.15
Feb. 11	35,110.52	4,151.06
Feb. 18	35,445.85	3,815.73

Norwalk

	Receipts.	Increase.
Nov. 19	$5,179.47	**$408.77**
Nov. 26	4,857.38	**730.86**
Dec. 3	5,088.84	**499.40**
Dec. 10	5,324.36	**263.88**
Dec. 17	5.659.38	71.14
Dec. 24	5,966.30	378.06
Dec. 31	5,232.74	**355.50**
Jan. 7	5,487.82	**100.42**
Jan. 14	5,729.68	131.44
Jan. 21	5,749.41	161.17
Jan. 28	5,667.94	79.70
Feb. 4	5,715.04	126.80
Feb. 11	5,706.43	118.19
Feb. 18	5,675.16	86.92

Note—Boldface denotes decrease.

According to the order and ruling of the commission the Connecticut Company has reported weekly on the results of the operating receipts. For the purpose of comparison the company gave the figures and receipts for the week preceding the date on which the order for the test went into effect in its report to the commission. Whether the system will be continued in the two cities after the expiration of the trial test is a matter that is entirely up to the Connecticut Public Utilities Commission to decide. Starting on March 1 a new schedule of fares on all lines of the Connecticut Company other than these two will go into effect, three rides for a quarter or a reduction of fare of 16 per cent.

A decrease in receipts is shown in every week of the test up to the present time from the Bridgeport lines. The amount of decrease ran from $514 in the week of Dec. 24, when the receipts were materially increased by holiday travel, to $6,462 during the week of Nov. 26. There was a greater fluctuation in the income from the fares in Norwalk. On the lines in that city there was a decrease shown in the receipts for six weeks and an increase in each week for eight weeks. The figures for each week in Bridgeport and Norwalk so far as they have been reported are shown in the accompanying table.

Agreement in Sight Between City and Railway

With a view to giving the Hamilton (Ont.) Street Railway the financial help it needs, members of the Civic Street Railway Committee recently recommended that an agreement between city and railway be arranged whereby the company is authorized to charge a straight 5-cent fare for the remainder of 1922 and thereafter, at the wish of the City Council providing it gives an adequate service and makes necessary repairs to roadway. E. P. Coleman, general manager of the property, stated that if a permanent agreement were reached and assurance was given that a 5-cent fare would remain in force then the company would guarantee to make all necessary repairs.

Lynchburg Company Permitted to Charge 6-Cent Fare on Interurban Lines

A 6-cent fare on interurban lines of the Lynchburg Traction & Light Company, Lynchburg, Va., was ordered by the State Corporation Commission on Feb. 16. The fare was formerly 5 cents.

The commission stated that the financial troubles of the company, which conducts a general lighting and gas business in addition to its electric railway service, were due to the railway operations. Figures upon which the commission bases its decision show that in this department the return in 1919 was 6.09 per cent, but that this fell in 1920 to 3.54 per cent and in 1921 to 13-100 of one per cent.

Following previous utility decisions the commission refused to grant such an increase in rates in the electric and gas service departments that the deficit in the railway department would be taken care of. Electric rates for lighting on the overhead system were advanced from 8 to 9 cents per kw.-hr. for the first 100 hours. Fractional increases were granted in rates for power. The gas rate permitted to be charged by the company was increased in August, 1921, by 30 cents per 1,000 cu.ft.

The traction company petitioned the commission for an 8-cent fare outside the city limits of Lynchburg, after the City Council had refused the company a 6-cent fare on its city lines. The commission, in August, continued the interurban 5-cent fare for six months, and the present ruling follows the trial period. The commission stated that a 6-cent fare should prevail on all the lines of the system.

Tri-City Wants Monthly Ticket

The Tri-City Railway of Iowa, Davenport, has asked for the monthly ticket system in Davenport. This followed after the motion of the company that the present fare injunction be dissolved was denied. The injunction order was issued in May, 1920, but under a modification the company was allowed to charge a 9-cent cash fare for adults, or 35 cents for four tickets. In June, 1921, the trolley company voluntarily reduced the fare to 8 cents straight.

The effect of the court's refusing to dissolve the injunction is to continue the present rate until the legality of the city ordinance is settled. This ordinance fixes the railway fare. Judge A. J. House of the Scott County District Court stated that the case involved the legal question of the power given to the cities by the Legislature to enter into contracts for fixing rates.

The ticket system which the company asked for is in effect in parts of Illinois, on the other side of the river from Davenport. In its motion asking for the adoption of the ticket system, the company asked for the following:

For passengers more than twelve years of age, the fare shall be 8¾ cents if paid for by the use of tickets or tokens sold at the rate of four for 25 cents.

Fares may also be fixed at the rate of 5 cents for each cash fare if the passenger holds a monthly identification card costing 50 cents, good only for fares paid during the month for which the card is issued.

For those passengers who do not have tickets or tokens and who are not holders of the monthly identification cards, the company is authorized to charge 1¼ cents over and above the ticket fare of 8¾ cents for each cash fare, making a total of 10 cents for such fares.

Children from five to twelve years will be charged a fare of 4 cents, while all children under five years may ride free if accompanied by parent or guardian.

Transfers will be issued according to the existing rules.

Muskegon Ruling to Be Tested

A friendly action has been started to test the authority of the city commission of Muskegon, Mich., in ordering the discontinuing of the bus lines between Muskegon and Muskegon Heights in accordance with the special election held on Dec. 15. The police have arrested George Tarr, an owner of a Muskegon Heights bus. Under the plan one witness will be sworn and Mr. Tarr will be found guilty. A fine or jail sentence will be given and Mr. Tarr will go to jail. Then the attorney for the bus owners will go into the circuit court and ask for a writ of habeas corpus to obtain the release of the defendant. The question will then be tried out in the circuit court on its merits and it is planned to take the issue to the Supreme Court.

Since the action of the City Commission in ordering the buses to discontinue operation went into effect, there has been some discussion as to the validity of the city ordinance. The bus owners decided to take action.

It will be the first test made in the State in this regard and it is considered important. The city will base its claims on the decision of the United States Supreme Court and state courts.

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Negotiations Suspended Temporarily for Operating Frankford Elevated

In the face of another demand from Mayor Moore of Philadelphia, Pa., for legislation to enable the city to operate the Frankford elevated, members of City Council clearly indicated on Feb. 16 that it was their intention to make terms with the Philadelphia Rapid Transit Company on the basis of the company's last offer, if Thomas E. Mitten remains in control of the property.

A message from the Mayor asking for the necessary legislation was referred to the committee of the whole at the session of Council. In the discussion that followed it was stated that the stock battle now going on between five directors and Mr. Mitten for control of the company had forced a temporary suspension of negotiations over the Frankford line.

Councilman Weglein upon being asked to explain the present status of the negotiations said that any hope of getting an immediate return of 5 per cent on the city's investment from the P. R. T. was a "will-o'-the-wisp and a mirage."

He is quoted as follows:

Negotiations had reached the stage where a guarantee had been given of through service from Frankford to Sixty-ninth Street with free transfers and a 7-cent fare. The only point to be determined was the amount to be paid the city. A counter proposition to that offered by the P. R. T. was made, calling for a payment of 1 per cent to the city the first year and an increase of 1 per cent a year until 5 per cent was reached.

Negotiations are now dormant because of the internal battle for control of the company. I do not know anything of the merits of that controversy. The Mayor seems to have taken one side. Colonel Potter the other, and Mr. Trigg, the other city director, is neutral.

We will know after March 15 with whom we have to deal. In the meantime I see no advantage to be gained in providing for an extension on Market street for a single orphan line. I believe the people want this line operated as part of the Philadelphia Rapid Transit unified system.

Government Won't Back Radials

The Government of Ontario, if reports of the recent caucus are correct, proposes to wash its hands entirely of hydro-radial affairs. The authority for this statement is the Toronto *Globe*. That paper says the Government of Ontario will not guarantee bonds issued by municipalities, or unions of municipalities, for the acquisition or construction of radial railways. It will not hereafter provide money to be spent on the preparation by the Hydro-electric Commission of reports upon hydro-radial projects. It will not prevent the municipalities which launch hydro-radial projects at their own risk from asking Sir Adam Beck or any other person who is a member of the Provincial Hydro-electric Commission from acting as Commissioners in the management of municipally owned Radials, but they must do so as the appointees of the municipalities, and not of the Government of Ontario. The *Globe* said:

If the proposed legislation, when introduced, sets aside existing statutes regarding hydro-radials to the extent indicated, it will render necessary a very radical change in the organization built up during recent years under the Hydro-electric Commission to stimulate the use of electric energy in Ontario.

Electrification May Follow Shoals Development

W. A. Mapother, president of the Louisville & Nashville Railroad, wants to see Muscle Shoals developed as a power site. He said so very plainly a few days ago in addressing the members of the Chamber of Commerce at Birmingham, Ala.

Anything that is good for the South is good for his road, said Mr. Mapother, despite the fact that the report had gained circulation that the Louisville & Nashville Railroad feared the loss of haulage of coal that development of the power site might entail through reducing coal consumption.

Mr. Mapother is quoted as follows:

If Mr. Ford should have a surplus of water power after serving his own plants at Muscle Shoals, the Louisville & Nashville would like to make trial of electricity in railroad operation. The branch from Sheffield to Columbia would be ideal for it. We might try it as far as Nashville. On the Sheffield branch we have steep grades that permit a heavy locomotive to haul small loads only. It would be a splendid opportunity there to try out electricity in the operation of railroad trains over difficult grades.

North Shore Line Seeks Private Right-of-Way

The Chicago, North Shore & Milwaukee Railroad has petitioned the Illinois Commerce Commission for a certificate of convenience and necessity to construct tracks on a new private right-of-way through Wilmette, Illinois. After leaving the private right-of-way of the elevated lines through Evanston, the cars of the North Shore line operate through the village of Wilmette, which is the second suburb north of Chicago, on the streets.

This short stretch of track of the railroad, subject to the regulations of the village, has been a source of many restrictions upon the railroad operations. The new right-of-way has already been largely negotiated. Opposition to the petition developed at the first hearing and the case was continued until March 17.

"Try Old-Time Courtesy"

Signs bearing these words have been attached to the front of all cars operated by the South Covington & Cincinnati (Ohio) Traction Company. The company management is seeking to encourage courtesy as the watchword among the throngs which assemble in the Dixie Terminal during the rush hours.

The latest issue of "Green Line Topics," a bulletin issued weekly to the patrons of the traction line, contained the following suggestion:

Let's adopt the suggestion of a Green Line patron and get back to old-fashioned courtesy by letting women passengers board cars first, just the same as you would do with a member of your own family.

Endeavors to Ascertain Rights for Regulating Utilities

Since the recent increase in passenger rates on the Pacific Electric Railway's Lines, as granted by the California State Railroad Commission, the Los Angeles Board of Public Utilities has always been governed by the "gentlemen's agreement" under which the State Railroad Commission and the Board have worked together in the regulation of the service rendered in Los Angeles by the telephone, street railways, gas and other public utility corporations.

Commissioner Kennedy of the Board in endeavoring to sweep aside this agreement contends that the city under its charter has supreme power to regulate the service rendered by the public utilities inside of the city, and that the State Railroad Commission has jurisdiction only over the matter of the rates to be charged. The resolution of Commissioner Kennedy, which was unanimously adopted by the Board, is as follows:

Whereas, the Supreme Court of the State of California has held that the California State Railroad Commission has jurisdiction in the matter of fixing rates; and,

Whereas, the city of Los Angeles, in the opinion of the Board of Public Utilities, has jurisdiction over all matters of service rendered by the public utilities, other than the fixing of rates; and,

Whereas, we believe grave danger may come to the city of Los Angeles through either loss of powers or disuse of powers which our City Charter prescribes,

Therefore, be it resolved, by the Board of Public Utilities of the city of Los Angeles that the interests of the city of Los Angeles are best served by contesting all exercise of jurisdiction in the city of Los Angeles by the Honorable California Railroad Commission other than the fixing of rates,

Therefore, be it further resolved, that the Honorable Mayor of the city of Los Angeles be and is hereby requested to confer with the City Attorney and determine upon a policy which will clearly define the rights of the city under our charter, and settle for all time the question of jurisdiction and the control within the city of corporate interests.

Another Five-Cent Champion

Senator William E. Martin of Buffalo, is sponsor for the so-called 5-cent fare bill in the upper house of the New York Legislature. In a statement Senator Martin declares that sentiment for a 5-cent fare is sweeping the State Senator Martin said recently:

The 5-cent fare bill will be passed if the people of the State will give it their support. No legislator dare defy public demand and opinion. I urge voters to write to their representatives and demand that they support this measure.

From all parts of the State I am receiving letters complaining against the hardships of 7, 8 and 10-cent fares and asking me not to let up in the fight. I have been approached by agents for traction companies and asked if I was in earnest with this measure. I think that I have made my stand clear to these gentlemen.

I shall insist that my bill be reported from committee. I know there are scores of legislators whose hearts are in their mouths for fear the bill will be reported and that they will be put on record. To put them on record is just what I shall seek to do.

Boston's Mayor Plans for 5-Cent Fare.—Mayor Curley, Boston, Mass., is now planning his campaign for a 5-cent fare. He has held several conferences with other city officials on the subject of the best way to proceed.

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Requires Railway to Reduce Fares

The City Council of Little Rock, Ark. has passed an ordinance requiring the Little Rock Railway & Electric Company to reduce its fares from 6 cents to 5 cents. The ordinance is to become effective on March 15. The measure repeals the ordinance passed eighteen months ago granting the company the right to charge a 6-cent fare for one year. The reason given for the passage of the ordinance is that the year has expired during which time the company was given the right to charge 1 cent extra for each fare, due to increased costs of operating. By a City Council ordinance the legal fare for the city of Little Rock is 5 cents, it is said.

C. E. Smith, an engineer of St. Louis, filed a report with City Attorney Clifford on an appraisal of the property of the Little Rock Railway & Electric Company. He was employed by the city to prepare the report so that the report could be used by the city in fighting the company's request for a 7-cent fare. The City Attorney last year refused the request of the railway for a 7-cent fare. The company then filed suit asking an injunction prohibiting the city from interfering with the collection of the fare. Hearing on the case was delayed pending completion of the report of Mr. Smith.

D. H. Cantrel, president, states that unless certain radical changes are made in the franchise of the company, the company will be forced to cease operations. The clauses of the franchise to which he objects require the company to do considerable paving, costing in the neighborhood of $550,000, it is said, and also require a system of free transfers, the sale of tickets to school children at half fare, furnishing free transportation to city employees, and paying to the city a certain per cent of gross receipts for the first 50 years of its existence.

The 1921 session of the Arkansas legislature abolishing the Arkansas Corporation Commission gave jurisdiction in intra-city rate matters to the cities themselves, hence the order of the Corporation Commission fixing the fares of the company at 6-cents is subject to repeal by the Council, it is said.

Testimony Heard in Chicago Fare Reduction Case

Testimony on cost of living was introduced by the city before the Illinois Commerce Commission during the week ended Feb. 18 to show why the rate of fare should be lowered on the Chicago Surface Lines. Officials of large industrial concerns and department stores stated that prices of their products had been decreased in the last two years. Some evidence was also given to the effect that labor is cheaper and more efficient at the present time.

Evidently fearing a political reaction, the city's lawyers carefully refrained from suggesting that wages of employees of the surface lines should be reduced.

Representatives of the trainmen's union were present during the hearings and said they would want to cross-examine witnesses later.

Another part of the session was devoted to testimony concerning cost of money and rates of interest, the city seeking to show that the present return of 7½ per cent allowed the surface lines is excessive. Attorneys for the companies showed by cross-examination that high grade utility securities are getting fairly high returns.

At a meeting held on Feb. 17 the City Council directed the local transportation committee to report at the next meeting on the possibility of getting a start on subway construction in the near future.

Transportation News Notes

Hearing Scheduled on Lower Fares.—Hearings are taking place in Chicago before the Illinois Commerce Commission on the petition of the City of Rockford for lower fares on the lines of the Rockford City Traction Company. The railway is opposing the proposition whereas the city is of the opinion that the figures of railway operation for 1921 are evidence why the fares should be decreased.

Testimony Ended in Duluth Case.—The Minnesota Railroad & Warehouse Commission has concluded the taking of testimony in the case of the Duluth Street Railway, which is asking for increased fares in Duluth. Arguments in the case will be heard by the commission Feb. 28, but a decision is not to be expected before May, it was stated. The hearing covered the valuation of the company, the rate of return and the form in which that rate is to be secured.

Will Hear Fare Petition.—The Public Utilities Commission of Connecticut will hold a hearing at the State Capital on Feb. 23 on the petition of the city of New Britain to require the Connecticut Company to reduce fares in that city from 10 cents to 6 cents without transfers. The petition states that the 10-cent fare is "discriminatory and more than just, reasonable and adequate to provide properly for the public convenience, necessity and welfare."

Seven-Cent Fare Ordered in Johnstown.—A universal 7-cent cash fare for the Johnstown (Pa.) Traction Company has been ordered by the Public Service Commission. This abolishes the special ticket rate of four tickets for 25 cents. The company asked that the 7-cent cash fare be raised to 8 cents and that it be allowed to charge 30 cents, instead of 25 cents for four tickets. The order is dated March 1, 1921, and has just been published.

Indianapolis Deserts Skip-Stop.—The skip-stop system on the lines of the Indianapolis Street Railway has been abandoned. The system was started two weeks ago on order of the Mayor, but was never popular. The company had nearly completed the marking of its poles along the streets, showing where the cars stopped under the skip-stop plan. The plan of loading and unloading passengers in the middle of blocks in the downtown district was ordered at the same time as the skip-stop plan, but was abandoned after having been in service a few days.

Cut in Fares Announced.—The New Jersey & Pennsylvania Traction Company, Trenton, N. J., announces a cut in passenger and freight rates between Trenton and the various towns it covers in Bucks County, Pennsylvania. The fare on the Morrisville division has been 7 cents when tickets were purchased at the rate of five for 35 cents. Under the new rate five tickets will be sold for 30 cents; on the Lambertville division, covering 18 miles four tickets for $2. On the Yardly, Newtown and the Bristol-Doylestown divisions six tickets are sold for 50 cents. The new rates will go into effect on March 15.

Higher Rates Suspended for Hearing.—The Mobile Light & Railroad Company, Mobile, Ala., must defer putting into effect its 8-cent cash fare with a 2-cent transfer charge. The commission issued an order recently suspending this proposal of the company for a hearing on March 15. The company's proposed increases, which were sought to become effective on April 15, allowed an increase of one cent in the regular fare with the privilege of buying seven tickets for 35 cents. School tickets would be offered at the rate of forty for $2 and fifty for $2.50.

Ask That One-Man Cars Be Abolished.—At a hearing before the electric railway committee of the Massachusetts Legislature, three legislators asked that one-man cars be abolished. It was alleged that the number of accidents on one-man cars was too high to permit their continued use. The committee is conducting hearings on several bills which would require two employees on each car. Homer Loring, chairman of the public trustees of the Eastern Massachusetts Railway, said that enforcement by the state of the provisions of the bill would force 300 miles of trolley to be abandoned in the state.

One-Man Car in Downtown Boston.—Boston (Mass.) Elevated Railway is now operating a one-man car in the business district of Boston between Franklin and Washington Streets and Rowes Wharf. It is designed to serve the business people who come to the city by the Boston, Revere Beach and Lynn Railroad and who cannot reach the business district except by an involved route and a 10-cent fare. The fare between Rowes Wharf and Franklin Street is 5 cents. Transfer privilege may be had for an additional 5-cent fare, which also includes service beyond Franklin Street. No other one-man car is operated in the downtown district.

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Personal Mention

F. D. Burpee Elected Director

Manager of Ottawa Electric Railway Has United Support of City and Company

To F. D. Burpee, who, as manager of the Ottawa (Ont.) Electric Railway, has had much in the way of electric railway honors, more was recently given when he was elected a director of the Ottawa Traction Company, Ltd. This new mark of appreciation brought forth enthusiastic newspaper comment which showed that Mr. Burpee is one of the first in the hearts of his townsmen.

His election as a director is an acknowledgment of his brilliantly successful work in connection with the vote on municipal purchase of the railway. To him chiefly is attributed the creation of a favorable public attitude toward the utility company so that at the plebiscite in Ottawa on Jan. 3 municipal ownership was rejected by a vote of 8,430 to 6,003. The vote for the extension of the franchise stood 8,415 in favor of it to 6,070 against it. The company therefore stands four square in its position with the general public.

Mr. Burpee's method is one easily stated, but hard to follow consistently. His rule is that of the old wag who advised his friend to do unto others, but to do it first. This, being interpreted into terms of electric railway managing, means that Mr. Burpee manages the utility as he would wish it to be managed were he the public.

Needless to say he has been successful and popular as a traction executive, for he has persistently spread this doctrine throughout the company. Not only has his own organization been aware of Mr. Burpee's success, but the *Ottawa Journal*, expressing the public attitude in an editorial on Feb. 8, spoke of him as follows:

> Mr. Burpee kept up the service in face of difficulties and cemented the good will of the people. He also discussed the problems of the future in a way that was considered fair and reasonable. . . . . So successful has he been that the *Journal* hoped before the plebiscite was voted on that should the city take over the street railway he would be retained as commissioner to assist in running it for the city.

Could any one, after that, doubt that Mr. Burpee has entrenched himself firmly in Ottawa?

Mr. Burpee's railway experience has been very largely with the Ottawa Electric company. From 1891 to 1893 he served with the Canadian Pacific Railway, but since then has been in the employ of the Ottawa Electric Railway. Within five years he was made assistant to the superintendent and secretary-treasurer and in 1912 he succeeded Col. J. E. Hutcheson as superintendent. After the war, during which, as major, he constructed narrow and standard gage railways on the British front, he continued his work as superintendent. Since 1920 he has been general manager.

Louisville Employee Is Director

Another milestone in electric railway history was erected when the Louisville (Ky.) Railway on Feb. 8 held an election at which employees of the company balloted on one of their number to serve as a member of the board of directors. Damon L. Kehl, clerk in the construction department, received 481 of the total of 1,106 ballots cast. Approximately 1,250 votes were possible.

The polls were open from 1 to 7 p.m. Voting places were established in twenty-three locations on the company's property, and a committee acted as teller at each voting place. The sealed ballot boxes were turned over to F. H. Miller, vice-president of the company and chairman of the election committee, and L. H. Broadus, secretary of the Co-operative Association, who were tellers.

D. L. KEHL

The six candidates for the post of director were members of the general committee of the Co-operative Welfare Association. Those competing for the post, besides Mr. Kehl, were John Peters, conductor; Chester Diersing, clerk in the cashier's department; George Brockers, member of the shops force, Gus Schmitt, conductor, and J. E. Burdon, of the motive power department.

Election is for a period of one year. Mr. Kehl attended his first directors' meeting Feb. 5.

Mr. Kehl has been with the company for more than five years, all of this time in the construction department. Mr. Kehl's previous work has been with newspapers. He became a reporter for a paper in Connersville, Ind., his home, and in the following year was made city editor. This position he filled competently for six years, when he joined the reportorial staff of the *Commercial Tribune*, Cincinnati, Ohio. Mr. Kehl was a machinist before he became a reporter.

Employees of the company have expressed satisfaction with the election. In Mr. Kehl they feel that they have a man who will represent their interests capably and who will be able to judge what is to the advantage of company and employees alike.

H. C. Couch Heads Two Companies

Scores Financial Success for Pine Bluff Organizations During Period of Depression

The extensive ramifications which the Pine Bluff Company and the Arkansas Light & Power Company, Pine Bluff, Ark., are attaining under the presidency of H. C. Couch call attention once more to the fact that Mr. Couch has achieved remarkable success as a utility head. An added testimonial is his recent election as president of the Pine Bluff Chamber of Commerce.

With $100, Mr. Couch approached the utility field as a capitalist. His courage was of course disproportionate to the amount of money at his command, but with the two he organized a telephone company at Bienville, La., and thus realized a dream of days when he had been a railway mail clerk and had watched long distance telephone lines being stretched across the country. Eight years after the formation of his Bienville project, Mr. Couch sold the telephone company for the sum of $1,500,000 to the Southwestern Bell Telephone Company.

Then the light and power game lured the utility adventurer. Speaking of it, he says: "I felt that the biggest opportunities come in building up rather than in tearing down, and that opportunity comes quickest when you are out looking for it. The electric light and power game seemed to offer just what I was looking for. I started first with forces in Malvern, then Arkadelphia, Camden, and Magnolia, all in Arkansas, and organized them into a company in the year 1914."

At present the big central station in Pine Bluff is the center from which power is furnished to a score or more of towns and industries in various sections of the state. Power is furnished also to the residents of the rice farming district.

The electric railway in Pine Bluff has been built up until it is a paying proposition. Most of the success of the two companies headed by Mr. Couch has been achieved in years of war and industrial depression. Every financial difficulty has been tided over, and dividends are being paid regularly. The company charges a seven-cent fare, and gives pleasing service to the people. It operates one-man cars.

One of Mr. Couch's hobbies is the wireless telephone. He has experimented with this new commercial convenience and has just recently had an outfit of this kind installed at the Pine Bluff office.

During the war he acted as state fuel administrator for Arkansas.

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Philip Seabury Smith, electrical engineer and, until Feb. 1, chief of the Latin-American Division of the Bureau of Foreign and Domestic Commerce of the United States, has joined the staff of *Ingeniería Internacional,* a McGraw-Hill publication, as associate editor. Mr. Smith has had extensive experience, not only in the United States but in South America. As associate editor of *Ingeniería Internacional* Mr. Smith will aid in developing a better understanding in the Latin-American countries of American Engineering methods.

S. L. Vaughan, traffic manager of the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., was elected a vice-president of the company at the last meeting of the board of directors. Mr. Vaughan will act as general manager of the company during the absence of M. K. Morley, president, who is leaving soon for an extended trip.

Obituary

John T. Darrison, Lockport, N. Y., former treasurer of the Buffalo & Lockport Railway, now known as the Lockport division of the International Railway, Buffalo, died on Feb. 5. He was sixty-six years old. At one time he was Mayor of Lockport and then Assemblyman from a Niagara County district. He was vice-president of the Farmers & Mechanics Savings Bank, Lockport.

Sylvester T. Everett, one of the country's pioneers in the promotion and construction of electric railway lines in the United States, died at his home in Cleveland, Ohio, recently, at the age of eighty-three. Mr. Everett built in Akron one of the first successful electric railway lines in the world. His brother, the late Henry A. Everett, was one of the organizers of the Northern Ohio Traction & Light Company, which now operates the system in Akron and also an extensive interurban state system. When Senator Marcus A. Hanna controlled the Cleveland City Railway, Mr. Everett was a director. He also promoted a railway system in Erie, Pa., and was instrumental also in building several extensive steam roads. Since 1877 Mr. Everett had been conspicuous as a financier, founding a number of Cleveland banks. His political activities were equally noted. In 1888 Mr. Everett was a presidential elector, and as a delegate to the St. Louis Convention he assisted in the nomination of his friend, William McKinley, for President of the United States. Mr. Everett was a charter member of Cleveland's Union Club. Among his friends he numbered Presidents Lincoln, Garfield and McKinley and Chauncey M. Depew, Andrew Carnegie and the late J. P. Morgan.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

New Engineering Corporation Formed

William McClellan, Peter Junkersfeld and Horace T. Campion have formed a new firm for engineering and construction work. Offices are temporarily at 141 Broadway, New York City. The new organization will specialize in power plants, transmission systems, water powers, electrification of railroads, and general industrial and utility engineering and construction. Mr. McClellan gained his early experience as engineer in charge of construction with the Philadelphia Rapid Transit Co. For several years he was a managing engineer with Westinghouse, Church, Kerr & Company, participating in the Pennsylvania Terminal engineering and the construction and electrifying of the Rochester division of the Erie Railroad.

Colonel Junkersfeld was associated with the Chicago Edison Company, and its successor, the Commonwealth Edison Company, from 1895 to 1919, and following this he was president of the Association of Edison Companies. In 1907 he entered the army and was engaged in the construction of cantonments. Since the war he has been engineering manager for Stone & Webster.

Mr. Campion's early experience was gained through work with the Philadelphia Rapid Transit Company, where he was assistant chief engineer in charge of the design and construction of carhouses, power houses, etc.

Since 1903 he has been engaged in general construction work.

Brooklyn Will Spend $1,500,000 on Track

The budget of the surface lines in Brooklyn for 1922 includes an approximation of $1,500,000 for track improvements. The order for rail has already been placed. It was obtained by the Bethlehem Steel Company, which will supply 5,000 tons. The type ordered is the 7-in. American Electric Railway Association standard grooved rail. The contract for ties has not yet been awarded. The engineers of the Brooklyn surface lines are also figuring on special work layouts for this year. The cost will be between $80,000 and $100,000.

Big Increase Reported in Power Apparatus Sales

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces a marked increase in the sale of large power apparatus in 1922, with January sales of $1,500,000 in turbine-generators and condensers. Some of the companies purchasing this apparatus were Pennsylvania Edison Company of Easton, Pa.; The Madison (Wis.) Gas & Electric Company; The North Carolina Light & Power Company.

Takata & Company, Japan, have ordered another large turbine-generator for one of their new plants.

Fifty steam auxiliary units were sold during the month for a wide range of applications, many of the purchasers bting industrial power plants.

Swedish Electric Locomotives for France

The Allmänna Svenska Elektriska Aktiebolaget has recently secured a contract from the French State Railways for construction of thirty electric locomotives at the company's works at Vasteras.

Reorganization in Personnel of Curtain Supply Company

Owing to the increase and expansion of the business of the Curtain Supply Company, Chicago, Ill., it has been found necessary to make a number of changes in the personnel.

T. W. Holt, heretofore secretary and general manager, has been elected a vice-president of the company in charge of all operations of the company, with headquarters remaining in Chicago. Ross F. Hayes, heretofore eastern sales manager, with headquarters in New York City, has been advanced to the position of general sales manager in charge of the entire sales of the company, with headquarters in Chicago. T. P. O'Brien has been appointed district sales manager in charge of the eastern sales, with headquarters at the New York office, 50 Church Street. Ralph Brown has been appointed district sales manager for the Western district, with headquarters in Chicago.

The changes indicated have been due to the increased lines taken on by the company, as well as to the normal expansion of the business.

Metal, Coal and Material Prices

Metals—New York	Feb. 21, 1922
Copper, electrolytic, cents per lb.	12.875
Copper wire base, cents per lb.	14.625
Lead, cents per lb.	4.70
Zinc, cents per lb.	4.83
Tin Straits, cents per lb.	29.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.575
Somerset mine run, Boston, net tons	1.875
Pittsburgh, mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	2.00
Central, Ill., screenings, Chicago, net tons	1.80
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	6.00
Weatherproof wire base, N. Y., cents per lb.	15.75
Cement, Chicago net prices, without bags	1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	94.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	90.00

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Increased Demand for Fuses

Most manufacturers of fuses report an increase in sales over six month ago with the prospect of a further increase in sales during the spring. The majority of producers appear to be working on a 10 per cent to 15 per cent better basis than that of last September, and one manufacturer reports doing double the business of six months ago.

The increase in building construction is one of the principal causes of this improvement. Other factors in bettering conditions have been an easier financial market, greater confidence in prices, and absorption of overstock, permitting dealers and jobbers to order up to their requirements. Deliveries of raw materials to manufacturers and of the finished product to jobbers and dealers were never better.

Prices have been fairly well established since Jan. 1, though there are some who claim that the absence of price change is merely a lull between price wars. This view is not widespread. It is true that the fall of 1921 saw as keen competition in this market as has been experienced in years, but there is little doubt now that manufacturers and jobbers have about reached bottom and that it would be suicidal to go further on the price-cutting path. There may and probably will be some adjustments still, but it will result from economy of manufacture or distribution and not from a desire to make sales without regard to profit or loss. It is the general opinion that sales are likely to remain at their present level for the next two months. After that the rise of the sales curve should be rapid and continuous.

Ties Exported During 1921

Commerce reports for Feb. 6, 1922, state that a total of 3,149,788 railway ties were exported during 1921. The principal markets were: Canada, 1,423,915; United Kingdom, 610,318; Mexico, 350,000; Honduras, 222,828. Cuba, Peru and a few other countries took the balance.

Commercial Engineering Conference Called

A second public conference on commercial engineering is being called by the United States Commissioner of Education to be held May 1 and 2 at the Carnegie Institute of Technology in Pittsburgh, Pa. A committee on commercial engineering has been in existence for some time. It was appointed by him to investigate business training of engineers and engineering training for students of business. The conference will consider the work of the commission and amplify it. The first conference was held in 1919.

The present conference will deal with the new problems in modern industries including job analysis and personnel specifications and the translation of these into units which can be taught; the training of the engineers for treating problems of community development, and for managing over-seas projects.

Track and Roadway

Philadelphia, Pa.—Sealed proposals for block signals and interlocking for the Frankford Elevated Railway will be received at the Director's office, Department of City Transit, until Jan. 31.

Northwestern Ohio Railway & Power Company, Toledo, Ohio, is building a sidetrack to the American Cement Plaster Company plant, at Port Clinton. It is planned by the company to move much of its product over the electric line through Toledo.

Mount Airy, N. C.—Preliminary plans were formulated recently for financing the construction of an electric railway from Sylvatus, Va., to Mount Airy. The line would be a standard gauge and fully equipped for heavy traffic. The route would be from Sylvatus via Hillsville and through Ward's Gap.

Oklahoma Railway, Oklahoma City, Okla., has proposed to build an interurban line from Guthin to Stillwater. A survey is now being made. General Manager Shartel also includes in his plan for the extensions from Stillwater to Yale, Cushing and other places contingent upon these towns participating in the financing of the line.

Houston (Tex.) Electric Company—will have its new tracks on Fannin Street completed by April 1, according to W. E. Wood, vice-president and general manager. The service on Fannin Street will be given a trial of ninety days before the tracks on Main Street are removed, according to the agreement between the officials of the traction company and of the city.

Power Houses, Shops and Buildings

Jamestown (N. Y.) Street Railway will remodel the old Lyric Theater Building so as to be suitable for a terminal.

Corpus Christi (Tex.) Railway & Light Company has purchased a 60-kw. steam turbine which is now being installed in the plant in Corpus Christi. This plant was recently destroyed by fire, putting the street car lines and light and power system out of commission. The electric railway lines will not be operated until the new generator is installed, according to E. H. Eldridge, general manager.

Southern Power Company, Charlotte, N. C. has closed a contract with S. Morgan Smith Company of York, Pa., involving water power construction amounting to $10,500,000. It was learned that the contract was closed Dec. 15, 1921. Carey A. Etnier, a representative of the S. Morgan Smith Company, negotiated the deal. The contract embraces the building of a dam which will cost $8,000,000 and a power house in North and South Carolina for the Watever Electric Company and the Great Falls Power Company, both of Charlotte, and subsidiaries of the Morgan Smith Company will supply the turbines and other power and operating machinery, costing $1,250,000.

Trade Notes

Medart Patent Pulley Company, St. Louis, Mo. has changed its corporate name to The Medart Company. This company handles everything in line shafting equipment.

Wilson Welder & Metals Company, Inc., New York, N. Y., manufacturers of Arc Welding Machines and Certified Welding Metals announces the appointment of R. L. White as district manager in charge of Detroit Office, 809 Kresge Building, Detroit, Mich.

W. McK. White, Goshen, Ind., has been appointed western sales representative by the American Rattan & Reed Manufacturing Company, of Brooklyn, N. Y. Mr. White will handle the sale of rattan products made by this company in conjunction with the products of the Columbia Machine Works & Malleable Iron Company.

Rathbun Jones Engineering Company, Toledo, Ohio, has appointed the Ingersoll-Rand Company, New York, general sales agent for Rathbun Gas Engines. The large sales organization and service department of the Ingersoll-Rand Company, combined with the fact that gas engines are used to drive compressors, pumps and other machinery which it manufactures, places it in a position to serve better the users of gas engines and other machinery. Rathbun Gas Engines are of the vertical, multi-cylinder type and are built to operate on Natural, Illuminating, Producer, Coke Oven, Oil Still and other forms of gases which can be successfully handled in an internal combustion engine. Sizes range from 100 brake hp. to 1,450 brake hp.

New Advertising Literature

The Copper Clad Steel Company has issued two leaflets giving technical data and wire tables on their signal wire and copper weld wire for series lighting circuits.

The Esterline-Angus Company, Indianapolis, Ind., has issued Bulletin No. 122 giving some suggestions in regard to a study of plant operation by the use of graphic recording instruments.

The Bridgeport Brass Company, Bridgeport, Conn., has issued a folder in regard to its "Ledrite Brass Rod." Advantages claimed for this are less tool wear, greater production and less rejections of finished parts.

The Deschanel Engineering Corporation, New York, has issued a bulletin describing its single line cableway for handling material. It is particularly applicable to the handling of coal, ashes, etc., between boiler rooms, cars and storage piles.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MACMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, March 4, 1922 — *Number* 9

The Value of Midyear "Conferences" Is Once Again Proved

A GREAT midyear conference has passed into history and has given additional proof of the wisdom of starting these midyear meetings of executives to discuss outstanding problems of the day. There was actually more discussion this year than before—it was more of a conference—and every one in attendance felt fully repaid for the time and money expended.

There was one interesting feature this year which should be repeated in future years. This was the practical setting aside of a full day—Monday in this case—for committee meetings. What this has done has made the Midyear Meeting even more of a "conference." It seemed that at least half of the total of those attending the meeting were in Indianapolis on Monday. There were dozens of informal conferences. There were six simultaneous committee meetings. In other words, the Indianapolis meeting proved a valuable opportunity for discussion of problems of the day, and for refreshing one's viewpoints on his own work.

The association's executives should be congratulated and commended for the manner in which this conference was planned and carried out.

Railways Will Make Greater Use of Bus Transportation

A GROWING use of buses by electric railway companies may be expected in the immediate future if one may judge from the general attitude of railway officials at the Midyear Conference this week. It was very apparent that railway executives see the need to use the bus and there is progress in analyzing the field of its application.

There was agreement among a very large majority of the executives that the monopoly principle in the business of supplying transportation service must prevail if the public is to be given the best service and the interests of all others concerned are to be best served. For this reason the bus, in railway areas, should be developed as a co-ordinated expansion of service.

Mr. Shoup, speaking from and of his experience in California, presented the view that co-ordination of bus and railway in that state—at least any mention of co-ordination or co-operation between present companies—is utterly impossible. The bus in California, he says, has been developed so far in a competitive way that the interests of the two are hopelessly divergent and that the situation there is a fight and a bitter one. He has small expectation, too, of any extensive bus development by railways even were the independent companies eliminated.

In New Jersey a similarly large development has taken place—the railways watch 25 per cent of the riders use the bus. But Mr. Danforth is not so hopeless as Mr. Shoup in seeing daylight ahead in a proper co-ordination of the two services.

In both of these states the independent unco-ordinated bus development is so extensive that railways in other states may well take these as examples from which the lesson may be drawn that the opportunity for them to undertake bus development as a co-ordinated part of the transportation monopoly is a fleeting one which exists today but may be gone tomorrow. California and New Jersey were the first places where the bus growth became formidable to the railways. The executives in those states concentrated most of their energies toward exterminating the bus on account of its competition rather than toward devising ways and means of guiding its coming as an ally. This is stated without the slighest intent to criticise, for these men were beset with the problem in its original aspects; it was all "jitney" and little "bus" at first. The remainder of the industry now has the benefit of the experience in California and New Jersey and the benefit of all the individual and concerted thinking and study that has been given to the problem in these last two or three years. It seems not improbable that, had this knowledge of the bus and the opportunity to stand off at a distance and look at the problem been afforded to the California executives as, in general, it has been afforded to those in other parts of the country, there would now be the general status of bus operation by the railways or in conjunction with them in California and New Jersey instead of the opposite.

The question now is: Will railways grasp the opportunity while it exists? Neither co-ordination nor monopoly is likely as a natural course unless the development of the bus is guided in that direction. This "guiding" means that the railways should inaugurate the use of buses themselves where there is a field for them. This will avoid the development of a competitive situation, costly to all, and will satisfy the desires of the public.

Expenditure of Time and Money in Selecting Employees Brings Big Returns

ELECTRIC railways are eager to put into effect any suggested plans which promise to insure a better grade of employee. This explains the interest in the co-operative study which is being made by the Transportation & Traffic Association's committee on personnel and training. There is no line of effort which may yield greater direct or indirect return than this.

The part of this subject which most needs attention now in selection rather than training of employees. The latter inherently demands just as much investigation, but electric railways have lately given more attention to it. One reason for this is that for a time there was difficulty in securing enough employees to keep the cars running, so that no comprehensive system of selection would have been of any use. The situation is different today.

Consider the money aspect of the matter. A conservative estimate of the amount of wages paid to platform men alone in the employ of the electric railways of this country is about $200,000,000. Suppose

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that by more careful selection of platform men this expenditure could be reduced 5 per cent, which does not seem an impossible saving. This would mean a reduction in operating expense of $10,000,000. How would careful selection produce this result?

The wisely selected employee may safely be assumed to be a permanent one, relatively speaking. Every man of this type reduces the average labor turnover and consequently all of those losses that go with high turnover, such as training expense, accident claims, loss due to ineffective operation of cars, etc. Further, a well-selected employee is one who will identify himself with the organization in such a way as to help carry out plans that are made to improve service and cut costs. It is difficult to express the results of such co-operation in dollars and cents, but it is nevertheless real. Again, a well-selected employee, by the way he handles the patrons of his car, will make the service so attractive as to prevent loss of business to competing means of travel, and he may even increase the business.

Speaking of this matter to the writer recently, the manager of an important city railway property said that one of the most urgent needs of the day is for railway executives to concentrate upon selection of personnel. As soon as the report of last year's committee of the T. & T. Association on selection and training of personnel for transportation department employees appeared this manager put the entire report into effect on his property with excellent results. He even went the committee one better in some particulars and actually did what was only tentatively suggested. The results are already showing in savings at the annual rate of tens of thousands of dollars in accident costs alone as well as economies in other items which cannot be so tangibly measured. One important result is that the company is becoming acquainted with the characteristics of its own operating staff, which it never knew before. What has been done on this property is being done or can be done on many others. Electric railway wage rates are now liberal, and it ought to be possible to get a higher grade of employee than formerly in view not only of the good wages but of the increasingly interesting and steady character of the work.

A Single New Idea May Be Worth a Year's Association Dues

AT THE meeting of the committee on company and associate membership held at Indianapolis, preceding the Midyear Meeting this week, definite plans were laid for presenting the claims of the association to nonmembers, both railway and manufacturing companies. In its work during the next few weeks the committee will stress, among other advantages of association membership, the service which the association renders to members who use the Bureau of Information and Service and other parts of the association machinery. This phase of the work should be stressed because the fundamental purpose of the association, after all, is to act as a clearing house for information in the industry. Through it each railway has a call upon all other railways for desired information and the spirit of co-operation which is engendered by membership in the association makes for cheerful compliance with requests for information made through association channels which would not be forthcoming otherwise.

In view of these circumstances it seems incredible that any railway, large or small, should not wish to ally itself actively with the association. And what is true of the railways applies also to the manufacturers, who need in their branch of the business information which the railways can furnish. When the far-reaching effect of even a single new idea in operation or manufacture is considered, it becomes obvious that it is worth while to be in a position to catch the new ideas as they fly.

Applying Some Real Research to the Rail-Joint Problem

TWENTY years ago there may have been some small virtue in the "bromide" which says in effect that the life of the track is determined by the life of the joint. But that the statement did not deserve the credence it gained is shown by the evidence presented by many tracks still in service with the original rails, although laid twenty-five or more years ago. The original joint plates may have all disappeared by now, having been replaced by others put on in repair, but the original rail, being still in service, is there to defeat an attempt to justify the alleged axiom mentioned above. It may be also admitted that work on the joints has caused at least one-half of all the expense of maintenance of track in paved streets to date.

But the rails themselves are still in service, and the fact that joints did not have an equal life emphasizes the serious need in the industry today for thorough engineering research. It is an old need which has all the earmarks of the famous "long-felt want." It is being met in part by the comparatively recent advances made in increased use of several forms of welded rail joints. These advances have been due to the courageous and persistent use and development of them by engineers of a few companies. The development work has been carried on at no small expense to the companies which have borne costs rightly a charge upon the whole industry. The result of these isolated efforts, as indicated by fairly reliable data, is that the welded joint in some form is used by 50 per cent or more of the companies having tracks in streets.

Going back to the beginning of things trackwise, it must be admitted that a long time has been required for the railways to get around to the welded joint idea, although the scheme of welding metals by means of the arc is almost as old as electric traction. The length of time involved in proving the value of arc welding as applied to rail joints has resulted primarily from an almost complete lack of co-ordinated effort at engineering research devoted to this and kindred track subjects. In spite of the agency for co-operative study provided by the predecessor of the American Electric Railway Association, engineers separately have lost goodly sums for their companies in various track-joint experiments. Some agency should have been established long ago, to try out the various joints and processes on a limited scale on behalf of the whole industry.

The committee on way matters of the American Electric Railway Engineering Association initiated last year a movement to promote the formation of a special committee on welded rail joints. This has now been organized. It is understood that the plans of this committee call for the application of thorough research principles to the study of its problem, taking in all forms of welds which have currency today. The committee is functioning under the auspices of the American Bureau of Welding. This first ambitious attempt at the application of research engineering to the welded rail joint problem should be heartily encouraged by every one interested.

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What Is a Hoosier?*

By Robert I. Todd
President American Electric Railway Association
President Indianapolis Street Railway, Indianapolis, Ind.

A Welcome to Indianapolis—And a Survey of the Present State of the Industry, with a Summary of Conditions Indicating a Continued Upward Trend—An Outline of the Advantages of Association Membership and Activity

WE OF the Hoosier State are proud tonight to welcome you. It is a great honor to have Indiana and Indianapolis selected as your meeting place, and it is a still greater honor to have you come to see us in such large numbers. But the greatest honor, perhaps, is to have this occasion graced by the presence of so many charming ladies, who, under the recent amendment to the Constitution, are now not only privileged to tell us what to do but are destined to direct the affairs of the Nation.

As I have met members of the association and their guests from all parts of the country today and tonight, I have been forcibly reminded of the origin of the nickname "Hoosier."

The name springs from one of the safety first methods used by the pioneers in the early days of Indiana. In those days settlers lived in constant fear of Indians, and it was not their custom therefore to answer knocks on the door without first inquiring as to the identity of the caller. When a knock came the householder inquired "Who's here?" The story goes that most of the settlers abbreviated the two words so that they sounded like the one word "Hoosier," and it was from this expression that the name "Hoosier" came.

Now as I see representatives of our industry from so many parts of the country and say "Who's here?" I seem to get the response "Folks from everywhere."

No other city in the country can lay greater claim to act as host or to welcome electric railway men than Indianapolis. Apart from its being the center of population of the United States, the largest inland city, the national headquarters of the American Legion and bearing the palm as the literary center of the country, Indianapolis occupies a most unique position in being the very center of perhaps the largest interurban electric railway system on this continent.

To the State of Indiana should be accorded the honor of operating the first interurban line, running between Anderson and Alexandria. The projector and builder is with us tonight. I refer to our honored and distinguished fellow townsman Charles L. Henry, who is known everywhere as the "Father of the Interurban Railway" in the United States, and the dean of the American Electric Railway Association. During

ROBERT I. TODD

all these years of his activity we have learned to respect and admire him more and more. No convention or meeting of the American Electric Railway Association or Central Electric Railway Association is complete without him. Long may he continue to be with us to direct and inspire our deliberations.

The financial necessities of our electric railways and the urgent need of their rehabilitation, as well as the policies to be pursued, have been so clearly presented during previous meetings held today and will be dwelt upon so ably and broadly this evening that it seems wholly unnecessary for me to attempt a further review. We are all agreed that at present many injustices are being worked upon electric railways. For instance, to regulate street and interurban railways and impose heavy taxes upon them, while permitting motor buses and jitneys to run at large unrestricted and practically free from taxation, is manifestly unfair and is bound to break down city transportation, so essential to the growth and development of every thriving community. There may be a legitimate use for motor buses as an adjunct to electric railway transportation, but they should be under the direction and control of the railway companies.

From present indications we may have to face a very serious coal situation on April 1 next and should be prepared for whatever emergency may arise. Other vital questions will occupy our attention during the next six months and will be taken up at the monthly meetings of the executive committee.

Yet at no time since the World War has this association met under more favorable circumstances. We are slowly but surely entering upon better times, and, although we cannot as yet exclaim with the Duke of Gloucester: "Now is the winter of our discontent made glorious summer," still we may confidently believe that we are at least approaching the springtime of a new and better era and that a complete realization of our hopes may not be far distant.

IMPROVED SITUATION SHOWN BY LATEST STATISTICAL INFORMATION

It may not be amiss to give you here a few cold statistics which may seem dry in an after-dinner speech, but which are most instructive and essential.

Figures compiled by the association from reports made by seventy-two representative companies give cause for optimism and show these outstanding facts:

The operating ratio in January, 1922, was 70 plus, in comparison to 76 plus in January, 1921.

During the general business depression in the last year the maximum decrease in revenue passengers was 8.9 per cent, registered in August and September. Subsequent months through January, 1922, show a decided improvement, the decrease in December, 1921, being only 4.4 per cent, and reports from half the seventy-two companies for January, 1922, show a decrease of only 4.5 per cent.

The decrease in revenue began only in July, 1921, and the maximum decrease registered in September was only 6.2 per cent. The decrease in January, 1922, had fallen to 4 per cent.

Due to the improvement in the operating rates already noted, the net operating revenue has increased consistently with the exception of the months of April and May, 1921, when, due probably to the inability of the companies to adjust themselves immediately to the declining traffic, the net showed a falling off of 2.9 per cent in April and 1 per cent in May. Since then, however, the increase has been steadily climbing, reaching a maximum of 26.2 per cent in December.

The service provided as measured by the number of car-miles operated, while it has adjusted itself to the decline in traffic, has necessarily lagged behind that decline. In other words, electric

*Introductory address at the annual Mid-year Dinner of the American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922

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railway operators have not decreased their service as much as the loss in traffic would possibly justify, but on the contrary have given consistently a slightly better service in proportion to the traffic than that given before the decline in traffic. This is clearly shown in the month by month figures for car-miles operated, the maximum decrease in which was 5½ per cent, which was not reached until January, 1922, the average decline of the previous months being approximately 3 per cent.

These figures and other facts about the industry make our outlook encouraging. The underlying condition of the industry is sound. Apparently the economic pressure on the industry is being relieved. Furthermore, the general public, in whose hands after all rests our future, is understanding our problems better every day.

We are beginning to see the light in many quarters, but herein lies a great danger. Because the clouds are beginning to lift we must not decide that all will be well and supinely cease our efforts toward better service and better understanding generally.

It behooves us as individual members to make the best possible use of the machinery provided by our association for aiding us in the solution of our problems. We can best work out our own problems by learning what methods other companies have used to solve problems similar to ours, and it is in assisting the individual companies to obtain this information that the association is well fitted to serve. The association has facilities for furnishing information about virtually every problem that arises on any property. Whether your question is one of operation, construction or finance, the association can and will gladly help you. Through its Bureau of Information and Service it will supply facts and suggestions regarding wages, fares, franchises, public regulation, publicity and advertising, the motor bus, the safety car, and a thousand and one other questions which today are uppermost in the minds of electric railway operators and executives. The association headquarters in New York are a storehouse of information from which every member can draw help without special charge of any kind.

I would strongly urge that all of our members avail themselves to the fullest of the opportunities which are here afforded. If the association does not have the sort of thing that you feel is needed, suggest subjects of study and research problems and the work will be gladly undertaken.

Just in proportion to the use we make of the opportunity to better our service and tell the public the facts about it will we progress and prosper. We must not only keep our house in order but we must let our lights shine brightly that the world may see and understand. And when we have done this we need fear nothing that any person may say about or do to us. The clean house which all can see tells its own story.

Most Successful Midyear Conference

Nearly Seven Hundred Gather at Indianapolis for Interesting, Meaty Discussion of Present Day Problems—The Correlation of Trackless Transportation and Railway and the Elimination of Unfair Tax Burdens Were Principal Topics—Dinner Addresses of Exceptional Quality

THAT the latest convention was "the best the industry ever had" has been said so many times as to have a tinge of "triteness." But to say otherwise about the Midyear Conference of the American Electric Railway Association held at Indianapolis on Tuesday of this week would fail to indicate that which is actually true.

And after all, this saying of "the best ever" frequently is accurate and is an indication of the unhalted progress of the industry.

At any rate the Claypool Hotel at Indianapolis was the scene of a most successful midyear conference, nominally held on February 28, but whose corollary activities started Sunday, Feb. 26, and ended not until Wednesday, March 1.

An attendance of nearly 700 was recorded at this meeting of such general interest. On Sunday, two days before the conference, large groups had gathered for the committee meetings which were to be held on Monday. A complete record of these is given elsewhere in this issue. And Monday was a day full of committee meetings, there being at least six held simultaneously during the afternoon. The hotel lobbies and corridors were full of railway men exchanging ideas and experiences.

The big day, of course, was Tuesday, when sessions were held which called forth later comments that "this was a real meeting and the subject matter was 'real stuff.'"

There were two sessions and an evening dinner.

The morning session was called to order at 10:32 with President Robert I. Todd in the chair. In an address of welcome Governor McCray said that Indiana stood out pre-eminently as the home of the interurban railway and that he had never heard the statement contradicted that more interurban cars were loaded and unloaded in Indianapolis than in any other city in the country. Further, he said that no doubt the way the state is improving its roads is proving detrimental to these interurbans but he affirmed his belief that the industry is fair minded and also that the state should continue its road work even though these good roads afford a means of direct competition. The railways also pay a considerable amount of their revenues in taxes and also for paving and it is to the interests of the state to safeguard the interests of the industry. A corporation is necessary for the conduct of the affairs of such a large industry and these corporations are entitled to fair consideration just as anyone else. Indiana is trying to do so.

GOV. W. T. MCCRAY

C. L. Henry next reported on the amendment to the constitution that heretofore had prohibited employees of non-member companies from becoming individual members. Under the plan, which was approved by the convention, that part of Section C of Paragraph IV of the constitution applying was eliminated, so that in the future the executive committee has the sole right to elect candidates to individual membership.

The subject for discussion at this session was the co-ordination of trackless transportation in the future service of the electric railway industry. There were four addresses on the program, each of which covered this question from a different viewpoint.

C. D. Emmons, Baltimore, compared city service in England with that in this country and gave some interesting figures as to operating conditions as drawn from his recent trip abroad. He also pointed out that in England the transportation systems were a monopoly and that there was no thought that the bus would supplant the rail service.

The next speaker, E. B. Whitman of the Maryland Public Service Commission, told how in his state the commission was attempting a co-ordination of services under a unified system in Baltimore and of the rules under which motor bus operation was permitted in other parts of the state. In Baltimore the commission had agreed, although the fact was not yet announced to the public, to allow 10-cent fares on the North Charles Street bus line if the

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United Company would put in some "honest-to-God buses."

Harry Reid, Indianapolis, discussed motor-bus and motor-truck operation from the interurban viewpoint. He believed that joint tariffs with truck operators would afford the farmer a chance to get his supplies to market at a lower cost than if trucked entirely over the highway. The plan would also enable the people in outlying parts of the country to receive shipments from the cities more quickly and at a lower cost.

The last speaker, Paul Shoup, Pacific Electric Railway, told of the motor bus situation in California and stated there could be no co-ordination of railway and bus in California now, as the interests of the latter are diametrically opposed to those of the railway in every respect.

An abstract of each of these four addresses is given elsewhere in this issue.

The report of the committee on co-operation of manufacturers in the interest of electric railways was presented by E. F. Wickwire, chairman. This report outlined a comprehensive plan whereby the manufacturer of materials used by the electric railways could aid the railway industry. This plan called for the dissemination of information concerning the industry through house organs and circulars not only to employees but to the stockholders in the manufacturing branch. He pointed out that only by general education can the public be taught the true situation that confronts the industry. By pyramiding all possible means of education of the public is one of the ways that will aid the industry. A more extended abstract of the report is given elsewhere in this issue.

Discussion on Relations of Railway and Bus

After the presentation of the four papers at the morning session on the relations of the railway and bus forms of transportation, the subject was discussed by Arthur W. Brady, Edward A. Dana, W. J. Flickinger and R. E. Danforth. Mr. Brady, Union Traction Company of Indiana, made the point that if we can convince the representatives of the public of the unfairness of subjecting the electric railways to the high taxes involved in the construction and maintenance of the highways for the use of the nearly tax-free highway common carrier, it should then be possible to bring about a parity of conditions under which railways and bus can operate without any injustice. That is all the electric railways ask, Mr. Brady said, in working out the solution of the competitive situation.

Mr. Dana, Boston Elevated Railway, spoke of the evidence afforded by this meeting of the value of the association in bringing out the different experience and viewpoints. He mentioned the study of the transportation situation made by the New England Street Railway Club which was recently completed (see ELECTRIC RAILWAY JOURNAL for Feb. 11, 1922) and said that the conclusion reached was that the electric railways must take hold of the bus as one of their tools of service. In Massachusetts there was an early realization of the need for monopoly and that the municipalities had been prompt in restricting competition so that the railways of the state are in a rather fortunate position in this respect. This early appreciation of the monopoly idea was undoubtedly brought to the fore by the participation of the State in the traction business through the trustee control. An installation of a bus line has recently been made as an auxiliary to the Boston "L," and Mr. Dana thought it was along this line that the use of the bus must be developed.

Mr. Flickinger, Connecticut Company, reviewed the jitney difficulty in Bridgeport briefly and told how this led to the law placing such transportation agencies under the jurisdiction of the state commission. He characterized the jitney operators by stating that of the 500 or 600 applicants before the commission for certificates of convenience and necessity only about 10 per cent were American citizens. The commission has followed closely a set of principles which it drew up as an initial step in undertaking bus regulation, making it the practice that wherever an existing railway is providing adequate service or can be made to provide adequate service no permit will be granted a bus line.

Mr. Danforth, Public Service Railway of New Jersey, said that many of the bus lines operating in New Jersey are earning enough profit to pay for a $4,000 bus in one year, and others are earning so little that they are changing hands three or four times a year. The Legislature passed a law last year requiring that bus lines must get a permit from the commission. But the bus operators get a permit to operate from some small town to the larger center and then operate into the latter over a car line street. They are permitted to do this provided they do not pick up passengers in the competing territory, but they do not observe this regulation.

There are 1,250 buses operating in New Jersey in competition with the railway. They carried last year one-fourth of the total riding public. This means that the car riders had to pay 1 cent to 1½ cents more carfare than they would without this competition. The patrons do not like to pay 8 cents and can't see why the fare cannot be put back to 5 cents, thinking that the lower fare would put the jitneys out of business. The company has been unable to find that the lower fare would not result in an even lower net earning.

The company feels that it cannot expect much relief from the Legislature, for the 1,250 individual owners have a sympathy and influence that it is difficult for a corporation to match. Public officials wonder why the railway does not go into the bus business, but it is realized that the corporation would have to give better service in better buses than the individual operators and that the service would therefore be more costly and a profit unlikely. But Mr. Danforth said that there is the consideration that when 25 per cent of the riding public has become accustomed to bus service, the railway company may be forced to operate some buses even at a loss; that it may be advisable to do this for the sake of stabilizing the whole situation. If it would not have this influence, there is no reason for the railway to get into the bus business.

Mr. Danforth questioned the advisability of the railways sticking their heads in the sand as to this problem and rather advised that by making use of this new mode of travel in a reasonable way, it ought to be possible to satisfy the public that the railway is up to date. The main thing is to preserve or establish a monopoly, whatever vehicle is used, for this is to the best interest of the public also. It may also be possible to show that the street car is the best and cheapest, by giving examples of the other, properly supervised and equipped.

Afternoon Session

The afternoon session was opened by the address of Hon. J. W. McCardle, chairman Public Service Commission of Indiana. Though the next speaker, Fielder Sanders, Cleveland, Ohio, had prepared the paper "Unfair Taxation Methods and How They May Be Eliminated," he said he would assume all those in attendance would read it and he would touch on the high points in other words. This was an assumption, he said, that a lawyer never takes in presenting a brief to the court, for otherwise his efforts might not have a fair chance of being useful. Continuing, he dwelt for a time on the importance of good public relations and then showed how a company operating under a service-at-cost franchise derives a certain amount of benefit from this form of contract because the public seems to gain a more intimate knowledge of how the business is conducted and what its troubles are. Taxation is only one of the numerous injustices that will be corrected by a correlation of the interests of the public and of the railways. Service-at-cost brings home to the people that they pay the taxes and it educates the people about the railway so much that they tell the railway, "We pay the taxes ourselves."

In the discussion that followed Ezra B. Whitman, Baltimore, recited specific instances of how a certain railway manager in his city had built up and maintained excellent public feeling by personally attending to the troubles of dissatisfied customers.

R. B. Stearns, Eastern Massachusetts Street Railway, claimed that there exists too much centralization in public relations work—it should be decentralized. His idea was that a car

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crew should be urged to consider their car as a vehicle of their own, and that in this way increasing their responsibility, they will handle the people with greater courtesy, safety, etc. Turning the company's $1,000,000 deficit into a $1,000,000 surplus over operating expenses for 1921 was due largely to the contact maintained with business men and newspapers.

J. H. Hanna, Capital Traction Company, claimed that the reaching of an agreement on the bus problem also hinges on getting the public point of view properly focused.

Arthur W. Brady, Anderson, Ind., then moved the adoption of the following resolutions:

RESOLUTION REGARDING TAX EXEMPT SECURITIES

Whereas, our present policy of Federal taxation has undergone a radical change from indirect to a system of direct taxation which relies chiefly upon levying a high rate of income tax upon those of large income, thereby causing a constantly increasing volume of capital to be diverted into the non-taxable securities of the Federal, state and minor sub-divisions of government, and

Whereas, this diversion has proved a serious handicap to productive enterprise by reason of the fact that, while exempting large incomes from the payment of taxes they would otherwise be obliged to pay and placing an unfair burden of taxation upon those who cannot benefit by such exemption, it gives an unfair competitive advantage in the money markets to the exempted securities, and

Whereas, the earnings of electric railways are limited by public regulation and consequently have been and still are insufficient to attract necessary new capital in competition with tax exempt securities so that they are now being forced to furnish inadequate and unsatisfactory service, which situation will undoubtedly grow worse rather than better if present tax conditions continue, and

Whereas, this situation can be corrected and the public properly served only by removing the competition from tax exempt securities or by making further and in many cases material increases in the rates charged by such utilities for their service. Now, therefore, be it

Resolved by the American Electric Railway Association that it recommends that necessary corrective legislation be provided to remove the present inequitable burden of taxation and to make all income from whatever source and in whatever form bear its just proportion of the cost of government and remove the discrimination now prevailing between securities of the Federal, state and minor sub-divisions of government and those of private enterprise.

In the discussion on this resolution W. H. Maltbie, Baltimore, criticised the statement that "the situation will grow worse rather than better if present tax conditions continue," pointing out that opposition in state legislatures would probably arise against any change so that the passage of a constitutional amendment would take a long time. Mr. Brady, however, did not think the expression should be modified. The resolution was then passed unanimously.

President Todd then announced that the next feature was a drill by the "first aid drill team" of the Chicago Elevated Railroads. An account of the purpose of the company in organizing this team and the extent to which first aid training had been adopted in Chicago was given by John J. Moran of the Chicago Elevated Railroads, in the absence of Mr. Budd. The squad of men then made their appearance. They were sixteen in number, besides the captain, and were dressed in white duck. A number of means of giving first aid were then given by the squad in an open space in the middle of the hall. The delegates frequently applauded as the men went through their evolutions. These included demonstrations of the following:

Sylvester method of resuscitation.

Schaeffer prone pressure method of resuscitation, done first by one man and then by four men.

Triangular bandage of the head.

Roller bandage of the hand with arm sling.

Triangular bandage of the shoulder and roller bandage of the face.

Roller bandage of the arm and tourniquet to control bleeding.

Stretcher drill.

Rescue from fire.

Rescue from electric current.

At the close of this demonstration, the president announced the close of the meeting.

At the evening dinner, there were about 650 in the main hall and some fifty women guests in another dining room. These ladies later joined the men to hear the addresses of the evening.

Harry Reid, chairman of the dinner committee, provided continuous entertainment during the dinner in the way of musical numbers by the Girls' Glee Club of Butler College and the Boys' Glee Club from Culver Military Academy. Between addresses after the dinner, there was an entertaining series of tableaux presented by the military students, depicting the genesis and development of military music and instruments.

President Todd proved an able and efficient toastmaster in his apt introductions of the three speakers of the evening. But first he made an introductory address of welcome to Indianapolis and pointed also to the present encouraging status of the electric railway industry.

He then introduced, in turn, the three speakers, Hon. W. D. B. Ainey of Pennsylvania, Samuel J. Insull of Chicago, and Mrs. Antoinette Funk of Washington, D. C. President Todd's address and the addresses of Mr. Ainey, Mr. Insull and Mrs. Funk all appear elsewhere in this issue.

After the speeches were finished, those who desired enjoyed dancing until late in the morning.

Meeting of the Executive Committee of the American Association

Convention for 1922 to Be Held in Chicago During First Week of October, with Exhibits as a Feature—Publicity Men's Advisory Committee Authorized—Committee Expenses Not to Be Paid By Association

A WELL-ATTENDED luncheon meeting of the executive committee of the American Association was held at the Claypool Hotel, in Indianapolis, on Monday, Feb. 27.

After an approval of the minutes of the previous meeting, Executive Secretary J. W. Welsh presented a long report which is abstracted elsewhere in this issue. The executive committee approved his recommendation that he or some other official representative of the association attend meetings of state and sectional railway associations whenever possible.

J. G. Barry presented the report of the finance committee, and gave the audit for the first quarter, under the new system of four audits per year.

The auditors reported that the books of the association are now kept in an excellent accounting condition so that a correct audit may be made at any time. The auditors further stated that the method now in use for safeguarding the association's funds and controlling expenditures from the funds is adequate and businesslike.

In the report of the policy committee, forwarded by Mr. Budd, the chairman, there were outlined the reasons why the executive committee believes it is the best policy not to pay expenses of committee members to committee meetings. This report of the policy committee is to be sent to all member company executives. It is printed elsewhere in this issue.

C. L. Henry reported the recent activities of the committee on national relations. This committee, he said, is in constant touch with national developments and legislative progress. He spoke particularly of the Bacharach bill, about which he thought there had been undue excitement, and of the bill providing for the sale of mileage books for railroad transportation. In its present wording this latter bill would probably include electric railways, but whether the provision was intended or will be allowed to remain is being followed by the committee.

The report of the publicity committee was presented for Mr. Shannahan, the chairman, by T. C. Cherry. The publicity committee made the definite recommendation that there be established a Publicity Men's Advisory Committee, to consist of nine active publicity men, with Labert St. Clair, director of the association's advertising section, as chairman. This committee would have round-table conferences as to ways and means, and would make recommendations to the main publicity committee. This recommendation was approved by the executive committee and the appointment of the advisory committee was authorized immediately.

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A report of the convention exhibit and location committee was heard. This committee reported a canvass which showed almost unanimous approval of having exhibits at the 1922 convention; and recommended that the convention be held with exhibits and at Chicago, during the first week of October, 1922. The exhibit would be held at the Municipal Pier and headquarters would be at the Drake Hotel. This recommendation was unanimously approved by the executive committee, provided that certain minor details, not yet finally completed, could be taken care of satisfactorily.

A report of the committee on company and associate membership was presented by F. R. Coates, chairman. This report showed a net loss of one company member since Jan. 20, and gains in other classes of membership. Mr. Coates also mentioned the committee's activities in getting new members, such as the preparation of a booklet reciting the advantages and necessities of membership, etc.

It was voted by the executive committee that the examining or approving committee on applications for individual membership be the committee on individual and company section membership, Martin Schreiber, chairman.

The executive committee named a committee consisting of J. H. Pardee, chairman of the finance committee, the four presidents of the affiliated associations, F. E. Webster, C. G. Rice, C. S. Kimball and L. H. Palmer, and Executive Secretary J. W. Welsh to make recommendations regarding past-presidents' badges for affiliated associations.

H. G. Bradlee presented a resolution, prepared by the joint committee of the national utility associations, having to do with the question of the tax-exempt securities. This resolution was approved by the executive committee for action by the main association at the Mid-year Meeting on Tuesday.

A question of possible modification of the method of assessing dues was referred to a joint committee, to consist of the finance and policy committees.

Other reports were heard from the dinner committee; the subjects and meetings committee; the committee on co-operation with state and sectional associations; the mail-pay committee; the committee on co-operation from manufacturers; all of whom reported progress but requested no particular action.

Those present at the meeting were: President R. I. Todd; vice-presidents, C. D. Emmons and F. R. Coates; operating members-at-large, P. S. Arkwright and W. H. Sawyer; manufacturer members, J. G. Barry, T. Finigan, L. E. Gould and George H. Tontrup; president of affiliated association, L. H. Palmer; past-presidents, A. W. Brady, C. L. Henry and John J. Stanley; Executive Secretary J. W. Welsh; T. C. Cherry for Vice-President J. N. Shannahan; W. V. Hill for Paul Shoup; Carl H. Beck for C. R. Ellicott; L. C. Datz for President Kimball; and the following guests: Harry Reid, E. F. Wickwire, Myles Lambert, H. J. Kenfield, H. W. Blake and H. V. Bozell.

Report of Secretary and Treasurer*

In Extended Analysis of Work of Association, Executive Secretary Summarizes Committee and Other Regular Activities, Including Co-operation with Government Agencies

By J. W. Welsh

Executive Secretary American Electric Railway Association

THE standing committees on policy, finance, national relations, subjects and meetings, publicity, and publications, as well as the continuing committee on company and individual membership have been organized and are functioning in the regular manner. As reports have been made from time to time to the executive committee by these committees, no special reference to their work is made at this time.

This year several important special committees have been authorized as follows: On trackless transportation, on education, on co-operation with manufacturers in the interest of electric railways, on co-operation with state and sectional associations, on special taxes. All of these are making extensive investigations and researches into these subjects, which are most vital to the industry. The continuing special committees on valuation, mail pay and electrolysis have been reappointed.

The association continues to be a member of the National Chamber of Commerce, the National Industrial Conference Board, the American Engineering Standards Committee and the National Safety Council, and is co-operating with the other utility associations through a national joint committee.

The activity of the association's bureau of information and service continues at approximately the same rate as during the previous year, when approximately 9,700 requests were received and answered. Since the October convention, the following requests have been answered each month: October, 918; November, 752; December, 920; January, 590; making a total of 3,180, or at the rate of approximately 9,500 per year. The subjects which have called forth the greatest interest are those relating to motor-bus operation, regulations covering jitneys, and the standard reports on fares and wages.

Since the beginning of the association year, a total of seven data sheets have been sent out, of which three were requested by committees, two by member companies, one by the federal government, and one on the initiative of the association. Above is given a list of these questionnaires.

By carrying out a policy of summarizing as far as possible in a service letter information to be furnished to member companies, it has been possible to keep within reasonable limits the number of circular letters sent to member companies. In general, the service letter has gone out on the first of the month and has included the announcement of the association's special reports and compilations available to member companies, as well as general items of information for the benefit of member companies. This, of course, does not include the publicity material prepared by our advertising section sent in general to the publicity mailing list of our member companies, which has been necessarily somewhat more voluminous. An effort, however, has been made to analyze carefully information sent out in order that companies may not be unduly burdened with a multiplicity of letters.

Since the first of the year President Todd has delivered addresses before the American Gas Association at its annual dinner in Chicago on Nov. 10, and before the New England Street Railway Club at its dinner in Boston on Feb. 2.

Your executive secretary also made a talk before the Providence Company Section at its meeting on Feb. 9. Your executive secretary also attended the annual meeting and dinner of the New York Electric Railway Association, held in New York City on Jan. 24, and the annual meeting and dinner of the Central Electric Railway Association, held in Indianapolis on Jan. 26 and 27.

It is believed that your executive secretary should take advantage of opportunities to come in closer contact with the various state and sectional associations at these annual meetings, as well as to visit the properties of member companies in order that the association headquarters office, especially the bureau of information and service, may be kept in closer contact with the current problems that are before the industry.

P. W. McGovern has been the local assistant to Charles L. Henry in charge of the Washington office for the last two years. During this period Mr. McGovern has carried on his work faithfully and, it is believed, successfully.

RECENT SPECIAL ASSOCIATION QUESTIONNAIRES

Subject	By Whom Sent	Date Sent
Excess Profit Tax	Excess Profit Tax Commission	Nov. 7, 1921
Pole Statistics	Member Company	Jan. 4, 1922
Interurban	Agricultural Comm. Association	Dec. 28, 1921
Working Conditions of Trainmen	Association	Dec. 30, 1921
Railroad Ties	Member Company	Jan. 3, 1922
Design Track Construction	Way Matters Committee	Jan. 25, 1922
Helical Gearing	Equipment Committee	Feb. 14, 1922

*Abstract of report presented to the executive committee of the American Electric Railway Association, Indianapolis, Ind., Feb. 27, 1922.

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As previously reported by the committee on publications, the magazine is at present without an editor, and Labert St. Clair, in addition to his other duties in charge of the advertising section, has been acting in this capacity. The magazine, however, is now being conducted on a very economic basis as a number of changes in its mechanical set up affecting its general style and appearance have been made. Since the beginning of the association year, however, the number of pages has been expanded somewhat over the minimum of ninety-six pages, which was maintained for a number of months during the previous year, and an average of 116 or 132 pages is now being maintained. An effort is being made to broaden the scope of the magazine to include articles of special interest to employees without in any way detracting from articles which appeal to department heads and executives.

The reports of the committee on publicity which have been presented from time to time cover this matter very fully, but in view of the fact that it represents such a large portion of the association's activity at the present time, it is worthy of special mention.

The association received a request from the Joint Commission on Agricultural Inquiry of the United States Congress to furnish information covering the connection of electric railways, both city and interurban, with the transportation of agricultural products. As originally presented, the scope of this inquiry was quite voluminous and covered a very comprehensive survey of the electric railway industry, including a complete analysis of the physical property of electric railways, their operating and financial statistics, and all legal and franchise regulations, federal, state and municipal.

The scope of the inquiry was, in fact, much more comprehensive than that of the special electric railway census of the federal Department of Commerce which is made each five years, and it was estimated an expense of over $200,000 would be involved in carrying it out. The matter was referred to the committee on national relations and Mr. Henry, chairman of the committee, and your executive secretary, called upon representatives of the commission, and after going over the matter with them and presenting the various reports that have been prepared previously by the association, as well as by the federal government covering this matter in a general way, it was possible materially to reduce the request of the commission. In fact, the information already existing in the association files was found to be sufficient when supplemented by a fairly limited questionnaire which was sent to ten of the principal interurban companies.

In addition to this, general statements were prepared by Mr. Henry and by the executive secretary covering the connection of interurban railways with transportation as related to agriculture. It developed that the chief interest of this inquiry is in connection with the steam railroads rather than city or interurban railways.

Many Committees Meet

THE Indianapolis meeting of the association was made this year the occasion for holding a number of committee meetings. These included meetings of several important American Association committees, as well as those of the Engineering and Transportation & Traffic Associations. The meetings were held during the two days preceding the Midyear Meeting or on the day following it. They were well attended.

Brief reports of the meetings held are given below.

Valuation

A meeting of the valuation committee of the American Association was held at the Claypool Hotel, Indianapolis, on Monday at 3 p.m.

The principal discussion was as to the exact program of work for the committee to undertake in the preparation of its report for the year. After a complete analysis of the field and the most desirable studies to be made, it was decided to concentrate the work of the committee on a thorough study of the so-called "yard-stick" method of valuation. It was proposed to obtain, analyze and portray, as far as possible, valuations made in this manner as compared to those made by detailed inventory to show the dependability of the "yard-stick" method of valuation. Tentative plans were made to obtain the necessary information upon which to make this study.

It was brought out at the committee meeting that it was not so much a question, always, of convincing commissions and companies of the desirability of this method of valuation as it was of educating the courts up to accepting this sort of valuation as competent testimony in valuation cases.

In the absence of Chairman J. P. Barnes, J. H. Hanna presided. Others present were: W. H. Maltbie, Martin Schreiber, A. W. Brady, C. R. Harte, A. S. Richey and Frank H. Miller, for J. P. Barnes.

The committee decided to recommend to Chairman Barnes that he call the next meeting for early in April.

Safety Work

The committee on safety work made some real progress in its meeting toward arriving at a practicable way of selling the gospel of safety to railway heads. A committee of three was appointed to draw up plans for safety work as applicable to four typical properties. The members of this committee are C. B. Scott, F. M. Rosseland and C. L. Van Aucken. The first organization would be one such as would be required to put in force a complete safety organization on a very large electric railway property. A second would outline the procedure and methods to be followed for starting a less extensive work on a smaller railway. For smaller, isolated companies a third scheme would be given in considerable detail, while the fourth would show the managers of the smaller railways what safety methods can accomplish.

It was brought out that the chief difficulty in promoting the safety idea was that so many railway heads consider this phase of their work an inconsequential portion of their duty. For this reason many, even when convinced of the value of safety work, have not a definite idea of how to undertake this work.

With these four typical recommendations it was thought that the movement could be given the greatest impetus and railway men the most immediate benefit. The material will include the fundamentals of the necessary organization and cite cases of companies already practising safety methods. It will also present a large amount of material which can be adapted to suit the conditions of any particular railway.

The discussion also brought out that a relation exists between fire hazards and safety and it was suggested that much help on the question of reducing this hazard can be extended to railway men, many of whom are not aware of the savings that can be made in insurance rates, as well as decreased expenditures resulting from the correction of dangerous practices. In this work the committee is taking steps to cooperate with the National Safety Council.

Convention Location

This committee met in the Palm Room of the Claypool at 10 a.m. on Monday, with John J. Stanley in the chair. Mr. Stanley first asked for a vote on whether there should be exhibits this year, and this was answered in the affirmative. The question of location was then considered. The advantages of Chicago were set forth by H. J. Kenfield in the absence of Mr. Budd. Mr. Kenfield declared that the new municipal pier was an ideal place for the exhibit, containing room for exhibits more than twice the area required at previous conventions, so that the exhibits could be arranged along one side of the pier. There are also rooms suitable for meetings. The pier is within a half-mile of the Drake Hotel and also is easily reached from the downtown hotels, and its use for convention week could be secured on reasonable terms from the city. Mr. Welsh then read an invitation from the Chamber of Commerce of Chicago, urging the association to select that city. Clinton E. Morgan, of Brooklyn, then reported on Atlantic City as a meeting place and said that his sub-committee, representing the Eastern members of the committee on committee location, recommended Atlantic City for the convention.

A vote then followed, and it was decided to recommend Chicago for the convention, provided satisfactory arrangements could be made for the pier and agreements as to charges with the hotels. This decision was later reported

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to the executive committee by Mr. Stanley.

National Relations

Chairman C. L. Henry of the committee on national relations called a meeting of that committee in his office on Monday afternoon. At this meeting he called the attention of the members to several bills now before Congress. After a discussion as to the extent to which these bills, if passed, might affect electric railways, the meeting adjourned.

Joint Session of the Trackless Transportation Committee

There was a joint meeting of the American, Engineering and T. & T. committees on trackless transportation at the Claypool Hotel at Indianapolis on Feb. 26. The purpose was for the two subordinate committees to report progress on their assignments from the main committee. Those present were Chairman H. B. Flowers, Baltimore; Samuel W. Greenland, Fort Wayne, Ind.; H. B. Potter, Boston; W. J. Flickinger, New Haven; H. A. Mullett, Milwaukee; and R. E. Danforth, Newark, of the American Association committee. The members of the Engineering Association's committee present were Chairman Martin Schreiber, Camden, N. J.; J. M. Bozenbury, Peoria, Ill.; and H. H. Clark, New York.

The T. & T. committee was represented by Chairman C. D. Porter, Hampton, Va.; J. L. Adams, Norristown Pa.; and J. E. Harvell, Richmond, Va.

After a reading of the minutes of the previous meeting of the American Association committee outlining its report for the year and how the two other committees were to co-operate, Chairman Schreiber of the Engineering Association presented a tentative draft of specifications for a bus chassis and body. This had been drawn by subcommittees of his committee and was presented to show that they were at work and thinking as to the details assigned them for study. Mr. Schreiber raised the question that they had been asked to report only on buses with seating capacities of twenty-one, twenty-five or twenty-nine and costing from $6,000 to $7,000, and asked for permission to include a design that could be built for $2,500 with a capacity of seventeen passengers on longitudinal seats. Chairman Flowers commented on his experience and said that the small capacity bus was too costly to operate but that there was nothing to prevent the committee from considering this smaller type, the reason it had not been included in the instructions being that no one had suggested such a type when the instructions were drafted.

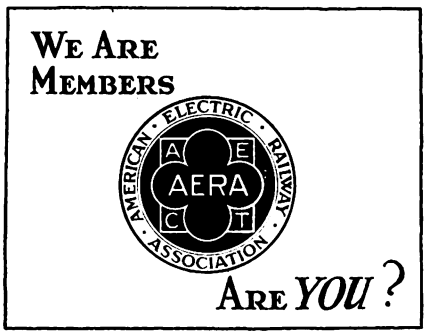
The chassis specifications suggested three designs with a floor height of not more than 26 in. with 34 in. solid or semi-pneumatic tires, a frame of maximum depth of section and riveted steel brackets to the side frames for supporting the body. The wheelbases suggested for the twenty-one, twenty-five and twenty-nine passenger bodies were 156 in., 176 in. and 176 in. respectively. Engine capacity was suggested as 30, 40 and 50 hp. respectively at 1,300 r.p.m. with gear ratio of not less than 7:1 and not more than 12:1. The brakes were considered as being all important and the tentative specification called for propeller shaft service brakes with braking surfaces varying from 150 sq.in. for the twenty-one-passenger bus to 200 sq.in. for the larger capacity.

The tentative body specifications provide for straight side construction, a 30-in. service door, with two steps, side post centers coincident with seat centers, curved corner front windows and a rear emergency door.

No tentative report was available on trolley bus operation. The T. & T. committee was not ready to report as it had not yet held a meeting. An informal organization meeting was held on Feb. 27 and plans made for holding a regular meeting in Baltimore about March 15.

Company and Associate Membership

The committee on company and associate membership met at the Claypool Hotel, Indianapolis, on Feb. 27. Chairman F. R. Coates, presiding, stated that



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sponsors responsible for promoting enrollments as company and associate members had been appointed by him in accordance with plans previously adopted. He believed the details of the promotion work could well be left to the initiative of these sponsors, aided by special pamphlets and other printed matter to be prepared and supplied by the association. The committee decided that some plan should be adopted making announcement, as for example on the floor of the convention, of new members of the association. ELECTRIC RAILWAY JOURNAL offered to contribute several of its advertising pages for a series of advertisements promoting the membership campaign. It was understood that *Electric Traction* would contribute in the same way. Another idea suggested was to provide individual members with an embossing seal for imprinting the association emblem on their stationery.

The committee laid plans for a special campaign for new members to be conducted during the forty-five days following March 15. The details of this will be announced by the secretary. Each railway company member is to be requested to display in its purchasing office the sign reproduced herewith. This is in three colors on an 8 x 10-in. card and supplied to the members.

The meeting was attended by Chairman Coates, M. B. Lambert, L. E. Gould, Secretary Welsh, President Todd, Labert St. Clair, E. F. Wickwire, W. H. Sawyer and L. W. Seeligsberg for H. H. Norris. The next meeting will probably be held in Mansfield, Ohio, in April.

Co-operation with State Associations

A meeting of the committee on co-operation with state associations on Feb. 2, at Indianapolis, was attended by Chairman W. H. Sawyer, R. V. Prather, W. V. Hill, Harry Reid and Secretary Welsh. The general policy of reorganizing the personnel of this committee to comprise the permanent executive secretaries of the state associations was determined upon, subject to approval of President Todd. It was felt that the men actively devoting all their time to the association work would be able to make more effective use of the exchange of information planned than railway executives would be likely to. It is planned to have a complete interchange among all committee members of all material got out for their memberships.

Engineering Executive Committee

A luncheon meeting of the executive committee of the Engineering Association was held Sunday, Feb. 26, at the Claypool Hotel, Indianapolis.

In discussion of the efforts to start an American Committee on Heavy Electric Traction, it was brought out that practically all other associations approached have agreed to co-operate with the A.E.R.E.A. The executive committee decided to appoint the usual heavy traction committee and to have the president, in conference with the chairman of the committee, choose members from the committee to represent this association on the joint committee. It was also decided to have this association take the initiative, through its president, by calling the first meeting in the very near future.

Progress reports were made from various sub-committees in co-operation with the American Engineering Standards Committee on the subjects of unification of specifications of wood ties, wires and cables and high-tension crossing specifications. On the last-named subject C. R. Harte presented four questions which had been raised and the answers which it had been proposed this association make, and these were approved.

A communication from the American Society of Mechanical Engineers was read requesting that this association appoint representatives on a joint committee on nuts, bolts and rivets. The president was authorized to do so.

A suggested standardization of shafting keys, in which the key for a given size of shaft would be standardized, was received from the American Society of Mechanical Engineers requesting indorsement or comment. It was decided to refer this by mail to the members of the equipment commit-

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tee and the standards committee for criticism, the result to be informally communicated to the American Society of Mechanical Engineers.

Question having been raised several times in the past to the method of adopting standards by the association, this matter was referred to the reorganization committee which is being formed now.

It was decided, after considerable discussion, to include in the engineering manual an abstract of pages 57 to 62 of the report of the 1921 committee on wood preservation, adjoining the wood preservation section.

In order to provide for the most effective presentation and discussion of papers at the annual convention, it was proposed that a set of rules be formulated as to time limits, etc., in this respect. Secretary Welsh was instructed to formulate such a set of rules, for instance similar to those used by the American Institute of Electrical Engineers, and report at a later meeting of the executive committee.

The committee approved the education committee taking over the work of the apprentice system committee.

With reference to the proposal that a standard nomenclature of engineering and mechanical employees be worked out, the committee decided to let that matter lay over till next year.

The president was authorized to appoint a representative to attend the National Fire Protection Association meeting, such representative to be chosen from the company nearest the location of the meeting.

It was brought out that the new A.S.M.E. Boiler Code, now including non-fired pressure containers, affects, or may affect, the air tanks of cars. Appointment of a representative of the association was authorized to confer with the Boiler Code committee on this point.

The committee authorized the secretary to continue his activities in presenting the request of the Engineering Association to the American Association that past-presidents' badges be authorized and furnished. Some samples were discussed.

In the absence of President Kimball, First Vice-President L. C. Datz presided. Others present were: Daniel Durie, Charles Clark, C. R. Harte, H. A. Johnson, A. B. Stitzer, Secretary J. W. Welsh and Special Engineer G. C. Hecker.

POWER GENERATION

The power generation committee at this meeting took steps toward the prevention of duplication in its work by that of similar committees of other national engineering organizations interested in electric power production. It was decided that permission should be sought from the committees of the Edison Association and the National Electric Light Association to have a representative attend their meetings and thus work on a co-operative, rather than a duplicating basis. For the reason that not all railways are interested in power generation and because of the work already done by those associations more intimately connected with this problem, it was not thought advisable to attempt the compilation of a comprehensive power generation report.

On the question of electrolysis it was impossible to draw a line definitely separating the work of the sub-committees on power generation and distribution committee. For this reason it was decided that but one report should be submitted. However, these committees would work independently and would prepare separate reports which later would be correlated and united into one complete report. A motion was passed assigning to the chairmen of the four sub-committees on electrolysis the duty of gathering data on these particular phases of the problem. They were then authorized to work with the distribution committee to compile the results, taking into account both generation and distribution problems.

Those in attendance were E. H. Scofield, chairman; A. B. Stitzer, G. W. Saathoff, W. E. Bryan, L. D. Bale, G. H. Roosevelt, and T. H. Hayes for F. C. Hanker.

Report of Committee on Policy*

THE payment of expenses of committee members by the American Association was discontinued by the executive committee in December, 1918. This action was taken primarily because the amount of money involved had been steadily increasing and represented too great a burden upon the association's resources. It was further believed that the payment of these expenses as carried on at that time did not represent an equitable arrangement, as the custom was not a universal one; some companies continued to pay the expenses of their officers and employees while others submitted the bill to the association.

The principal argument for the payment of these expenses by the association has been that the work of the committee is for the benefit of the industry at large, therefore the cost should be distributed over the entire association. In addition to this, it has been argued that it permits a freer selection of men, since none need refuse on the score of the cost of attending committee meetings. This argument has been especially advanced in the case of certain companies, which either owing to their geographical location or because of their financial condition were unable to defray the expenses of their representatives.

The above point of view, while worthy of consideration, does not, in the opinion of the committee on policy, cover the situation, as it fails to take into account the benefit which accrues to the individual committeeman as well as his company as a result of his participation in this work. In other words, a man by serving on a committee, in the first place, has an opportunity for broadening his knowledge and becoming a stronger and more capable officer of a company. In the second place, the special knowledge frequently acquired by committeemen as a result of their investigations has, in a number of cases, been of direct benefit to their employing companies. For example, a member of one of the engineering committees last year as a result of his committee work learned of certain developments which resulted in the saving of approximately $20,000 to his company. This was a matter which would not have readily come out in the committee's report, and even had it thus appeared it would have been too late to save the company the cost in this case, as it had already started an expensive construction which he was able to discontinue as a result.

Membership on association committees is in complete harmony with the policy which many companies have of encouraging their officers in belonging to the local Chambers of Commerce, Rotary Clubs and other civic organizations where they have an opportunity of taking part in community affairs for the development of mutual understanding between the company and the public. In the case of association committee work the opportunity is presented for interchange of views and policies as between companies.

So far as the actual effect on the attendance at committee meetings is concerned, the experience of the Engineering Association last year, from records in the secretary's office, show that the average attendance was 77 per cent of the theoretical full attendance. In view of the fact that the membership on committees has been distributed geographically throughout the country and certain members of committees accept appointment with the understanding that they will conduct their work by correspondence, it does not appear that this question has had a serious effect on committee work.

A recent computation of the actual cost of the bare traveling expenses alone, including only railroad and Pullman fare, for all members of the committees of the various associations for a year developed that this would amount to approximately $40,000. It, therefore, seems hardly justifiable as a sound financial policy at the present time for the association to undertake to assume so great an addition to its normal expenses, representing more than 25 per cent of the income from dues.

In view of this, the committee on policy suggests that the attention of member companies be directed to the considerations set forth in this brief review of existing conditions and that so far as possible member companies lend their support to committee work by defraying the expenses of their representatives.

*Submitted to and approved by the executive committee of the American Electric Railway Association at Indianapolis, Ind., Feb. 27, 1922.

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Trackless Transportation and the Electric Railway

Consider Service Essentials, First and Always, Was the Burden of the Symposium of Papers Presented at the Indianapolis Meeting of the American Electric Railway Association and Dealing with the General Theme of Transportation Co-ordination

THE morning session of the Mid-year Meeting was largely occupied with a discussion of the place of trackless transportation in the field now largely occupied by the electric railway. The speakers scheduled to prepare opening remarks on the subject were E. B. Whitman, member Maryland Public Service Commission, Baltimore; C. D. Emmons, president United Railways & Electric Company, Baltimore, Md.; Harry Reid, president Interstate Public Service Company, Indianapolis, Ind., and Paul Shoup, president Pacific Electric Railway, San Francisco, Cal. Abstracts of the papers in this symposium follow:

How the Maryland Commission Acts*

Transportation in a Community Is a Natural Service Monopoly—Commission Believes in Co-ordination of All Services

By Ezra B. Whitman

Member Public Service Commission of Maryland

IT PROBABLY is not necessary for me to argue before you gentlemen that urban transportation is a natural monopoly, and that the public will be served best where the transportation needs of the particular city or community are met by a unified system. In Baltimore, my native city, the evolution of the transportation industry has been the same as that of the other older cities of the country. First we had the stage coaches, next the horse cars, then the cable cars, and still later the electric cars. The present trolley system of Baltimore represents the consolidation of sixty-three different companies. A number of these companies were being operated by the same interests at the time of the final consolidation in 1899.

In the early days of the electric lines, competition for traffic and jockeying for franchises led to over-extension of many of the lines, and some of these lines, after the lapse of twenty-five years, are not yet self-sustaining.

The consolidated company, the United Railways & Electric Company of Baltimore, had an absolute monopoly of the transportation business of the city until the advent of the jitney bus, in 1915. The first jitney bus to make its appearance on the streets of Baltimore was operated by a woman, and was placed in service in February, 1915. Before six months had elapsed certain streets leading into the heart of the business section were literally over-run with jitneys.

The pioneers of this field of transportation had no knowledge of the requirements of the business in which they were engaged. In the main the owner of the bus was also the operator, and he made no effort, and probably was unable, to determine whether he was operating at a profit. The operator knew that he was taking in more cash, in the way of fares, than he was expending for gasoline, garage hire and other current costs of operation, and drew the natural, though erroneous, conclusion that the difference between the income and the outgo represented the return to him for his services and his investment, and promptly spent it.

Alas, when the tires of his bus were worn out, he found that he had no money left from his operations with which to replace them. The first of the year rolled around, and he had to borrow money to pay for his automobile license for the new year. If he happened to be able to weather these minor difficulties, his real trouble came when his bus had to be replaced. It was then that he realized that something, he knew not what, was wrong with his accounting and financial systems. In all likelihood, he had never heard the word "depreciation," or the term "depreciation reserve," and he had no conception of their meaning. He either dropped out, or borrowed money with which to buy a new bus.

Aside from a few scattered buses operating in various sections of the city, the operations of the jitneys were confined to one line with a number of buses, on Charles Street, the main north and south street of the city, and to a number of individual buses on Fayette Street, one of the principal east and west streets. The street railway company, fighting fire with fire, or rather buses with buses, started a competing line on Charles Street, and when the independent line had been forced to retire from the field, the company likewise sought permission to discontinue its service. This permission the commission has refused to give, although according to figures submitted by the company the line has always been operated at a loss.

The Fayette Street line of independent buses continues to operate, the commission restricting the number of buses on this route to thirty-three. There is always a waiting list of applicants who are anxious to secure permits for this route. I might say in passing that the service furnished by some of these individual operators is so poor that if a large corporation attempted to give the same grade of service our commission would undoubtedly receive strong and numerous protests from the people who use these buses with vigorous demands for improvement of the service. While the commission is giving these lines the closest supervision permitted by its limited force and is endeavoring to require the operators to maintain their operating schedules, it finds it almost impossible to prevent the individual operators from discontinuing their trips when business is slack, resuming operations when traffic is brisk. In other words, some of these operators desire to take only the "cream" of the traffic during the peak periods and are not concerned with their duty to the public of furnishing safe and adequate service at all times and hours.

Commission Believes in Monopoly

The Public Service Commission of Maryland was given jurisdiction over jitney buses by an act of the General Assembly in 1914, but the mushroom growth of the jitneys in 1915 clearly demonstrated that if the commission was to exercise an effective control over this form of transportation it must be given more direct and summary power to enforce its rules and regulations. The result was that in 1916 the General Assembly enacted an amendment to the act requiring the owners of motor vehicles engaged in the public transportation of persons and property over fixed routes and on regular schedules to obtain permits for such operation from the commission, and also gave the commission the power to prescribe and enforce rules for the operation of such vehicles.

Until within the past year, the attitude of the local street railway company, as well as of various other established transportation companies in the state, was first that of *laissez faire*, the companies probably believing that the ruinous competition between the buses

*Text of paper read at eleventh Mid-year Meeting of American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

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and the lack of proper management and application of business principles would soon result in the failure of all those engaged in this new form of transportation, and that the monopolies previously enjoyed by the several railway companies would be restored.

The Maryland Commission is convinced that the transportation needs of any city can be served best by permitting one company to maintain a monopoly. Many railway companies seem to have jumped to the conclusion that the motor bus has no place in the transportation system of a city, and consequently have failed to make the necessary studies to determine just how buses can be used to advantage, as supplementary to or extensions of the existing electric railway systems. The bus has been used with success in Europe for a number of years, and that it has a legitimate place in urban transportation in America is the sincere conviction of the writer and his associates on the Maryland Commission. The problem is that of determining its place and then keeping it in its place.

The railway companies now are coming to realize that their original policy of "hands off" was ill-advised, and that they must recognize the motor bus as a real, and probably permanent, competitor. In Baltimore the Fayette Street buses are collecting about $600 per day, and practically every dollar of this money is a dollar lost to the street railway company. We find the president of one of the largest and most substantial railroads of the country complaining of the competition of the motor trucks and buses, particularly on the branch lines. How much better it would have been if the railroad operators had met the situation squarely when it first arose and had had the vision to plan for the future, using the motor vehicles as auxiliaries and feeders to the rail lines instead of allowing them to become competitors.

Growing Sections Entitled to Transportation

Two years ago the limits of Baltimore City were extended, so that at the present time the area of the city is three times as great as it was before annexation. There are a number of suburban electric railway lines running through the territory of the new annex, but at the same time there are a number of growing sections which are without means of transportation. These sections would develop much more rapidly if there were adequate facilities for transportation, and property values would increase, to the immediate benefit of the property owners. The city and State would share in this increment, by reason of additional taxes upon the higher assessed valuation.

That the people of these growing sections are entitled to some means of transportation practically is conceded by all concerned. In some instances motor vehicle operators are willing to furnish service of a kind provided they are permitted to bring their passengers into the center of the city. This permission the commission is not inclined to grant, for several reasons. It would result in a paralleling of the lines of the railway company, sometimes for several miles through a sparsely settled suburban community, and would also result in increasing still further the congestion in the downtown section.

It also has been the experience of the commission that while such lines, in order to gain access to the city, are willing to agree that they will not solicit or handle local passengers, they soon forget the agreement and are not averse to augmenting their revenues by picking up local passengers. At the same time, the commission must secure service where it is required, and if the railway company cannot or will not furnish such service, the independent bus lines must be permitted to operate.

Feeling that the transportation requirements of Baltimore and the territory adjacent thereto can best be met by the present street railway company, the problem which faces the Maryland Commission and the company is that of determining the means by which the service where needed shall be supplied and on what terms the extensions shall be made. The real estate developers, knowing that as soon as transportation facilities are provided they can sell by the front foot land which they have purchased by the acre, are insistent that the commission require the company to make extensions into the sections where their holdings lie, and the scattered pioneer householders in these sections indorse the demands of the real estate developers. Their contention is that means of transportation must of necessity precede real estate development. They overlook entirely the fact that until such time as the line proves self-sustaining, it constitutes a burden upon the rest of the system, and that the deficits from its operation, in the natural course of events, must be borne by the car riders in the built-up section of the territory served. This burden takes either the form of higher fares or poorer service.

Some years ago the commission ordered the Baltimore company to extend one of its lines. The commission found that if a single-track line were constructed and a minimum service furnished, the extension could be operated at a small profit. The company contended that if it were to build a line into this territory, in the judgment of the management, it should build a double-track line, and that if a double-track line were built, service could not be furnished at a profit. Upon appeal, the courts sustained the contention of the company and restrained the commission from enforcing its order requiring the extension.

The Federal Electric Railways Commission in its report to the President of the United States said:

> Your commission would urge that in every community, where and to such extent as may be practicable, consideration be given to the advisability of requiring extensions and rapid transit systems of subway and elevated to be paid for, not out of new capital invested through the medium of bonds or stock, which means for all time an added burden upon the car rider, but from special taxes assessed against the owners of property in the district the value of which is enhanced by such extensions.
>
> This would not be a new principle; it would be merely the application of an old principle. The American property owner has been accustomed to contribute out of the increase in value of his property to the cost of building streets and other public improvements. The principle is peculiarly applicable to improvements of city transportation systems, because of the enormous increases in real estate values created when new extensions open up new territory or when the creation of rapid transit facilities make outlying territory more available.

Since 1909 New York City has had authority, under an amendment to the rapid transit act, to construct rapid transit railroads and to assess upon the property benefited the cost of such construction, in whole or in part. The authority granted by the law, however, has never been invoked, so far as the writer has been able to ascertain.

The private ownership of the Baltimore company has made impracticable the use of the assessment plan, although it doubtless could be accomplished if the city, county and state governments were to agree upon the necessary legislation and have such legislation enacted into law. The principle of assessment upon property benefited is very familiar in Baltimore, this plan being followed in paying for the cost of opening streets, changing grades of streets, etc. After the great fire of 1904, a considerable portion of the cost of the improvements in the "burnt district" was met by assessment upon the properties benefited.

COMPARISON OF INVESTMENT AND OPERATING EXPENSES

Trackless Trolley

Investment:	
Six miles overhead construction at $5,000 per mile	$30,000
Three buses at $10,000 each	30,000
	$60,000
Annual costs—	
Fixed charges:	
Interest $60,000 at 8 per cent	$4,800
Depreciation on overhead—5 per cent on $30,000	1,500
Depreciation on buses—15 per cent on $30,000	4,500
	$10,800
Operating costs:	
312 bus-miles per day at 22 cents per bus-mile = $68.64	
68.64 x 360	$24,600
	$35,400

Buses

Investment:	
Three buses at $6,000	$18,000
Annual costs—	
Fixed charges	
Interest—8 per cent on $18,000	$1,440
Depreciation—15 per cent on $18,000	2,700
	$4,140
Operating costs:	
312 bus-miles per day at 35 cents per bus-mile = $109.20	
109.20 x 360	39,300
	$43,440

Single Line Electric Railway

Investment:	
Six miles track and overhead at $35,000 per mile	$210,000
Three one-man cars at $6,000	18,000
	$228,000
Annual costs—	
Fixed charges:	
Interest—8 per cent on $228,000	$17,240
Depreciation—5 per cent on $228,000	11,400
	$28,640
Operating costs:	
312 car-miles per day at 20 cents per car-mile = $62.40	
62.40 x 360	$22,450
	$51,090

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Several months ago the residents and the owners of property along one of the main highways leading to the city sought the aid of the commission in securing for them transportation service to and from the city. A survey of the situation developed that it would not be feasible at this time to construct a line of railway to serve this section, due to the high cost of track construction and the comparatively small amount of traffic which would offer.

The commission and the railway company then turned to a study of the possibility of using either motor buses or trackless trolleys to take care of the needs of the community in question, and it was determined that the trackless trolley would best serve the purpose. The accompanying figures show the approximate capital investment, the fixed charges and the operating expenses for a trackless trolley, bus line and single track electric railway line for serving the territory under consideration. These figures are based upon such costs as were available to the commission and are probably sufficiently correct for purposes of comparison.

The commission suggested to those interested in securing transportation in the community under consideration that they confer with the officials of the railway company. As a result of this conference the railway company submitted a proposal to the officials of the improvement association of the neighborhood, calling for the property owners to guarantee the entire operating expenses, depreciation and interest charges, so that the company would not be subjected to any possible loss in the operation of the new lines. As a counter-proposal, the representatives of the improvement association suggested that they buy $10,000 worth of tickets a year from the railway company, thereby guaranteeing at least a revenue of $10,000.

Not being able to reach an agreement, the improvement association carried on negotiations with one of the best managed bus lines in the State of Maryland, and this bus line agreed to run buses over this route, provided the commission would permit the buses to run parallel to the street car lines to the center of the city. Not being willing to grant this permission, the commission finally called together all the interested persons and pointed out to the railway officials that inasmuch as they have been granted a monopoly of the transportation system, there were certain obligations which the railway company should meet in the way of furnishing necessary transportation. It was also pointed out to the property owners that they would largely benefit by the installation of the transportation line, and if they had faith in the development of their section that they should be willing to assume responsibility for at least a large part of the losses of the railway company during the development years.

As a result of this conference, it was finally agreed that the improvement association would endeavor to raise sufficient funds to guarantee the railway company against losses up to $10,000 for the first year, $7,500 for the second year and $5,000 a year for the next succeeding three years. If the traffic develops so that there would be no losses, then this money will be refunded to those who put it up as a guarantee, while, if the losses are greater than the amounts above stated, the street railway company will stand such losses. This agreement was approved by the improvement association and a considerable portion of the money was raised at the first meeting where this plan was submitted, and it is hoped that the entire funds necessary for the guarantee will be raised within the next few weeks.

This arrangement commends itself to the commission as being eminently fair, and may be used in other cases where there is a demand for transportation service. In point of fact, there are at this time at least twelve other localities in Baltimore where transportation is desired.

It is the belief of the writer that in every community the public will be best served by a co-ordinated service and a unified system in which the electric trolley line, the trackless trolley and the bus will each serve a useful place in the field of transportation. It is believed that it is a great mistake for the street railway companies to refuse to give service and to permit a part of the transportation facilities to be furnished by outside interests, which at all times are potential competitors even though they start in such a way that there is no competition. We also feel that the established transportation system is in a position to give better service than any possible independent operator, and it is our belief that not only will the urban transportation systems in the future be compelled to utilize trackless methods of transportation to supplement the existing electric railway lines, but we also believe that throughout the rural districts the railroad companies will find that their interests can best be served by establishing feeder lines of buses rather than to allow the bus transportation to fall into the hands of those who will establish competing lines.

City Service and British Conditions*

By C. D. Emmons

President United Railways & Electric Company of Baltimore

Development of City Transportation in America—Observations on British Tramway Conditions and the Place of the Bus, Based on a Trip Last Summer

THE history of transportation in any large city will be, to a large extent, the history in all others. In Baltimore, which in 1854 had a population of approximately 175,000 people, a transportation system of horse-drawn omnibuses had gradually developed. With wages of only 10 cents to 15 cents per hour, a fare of 5 cents was charged. It was not until May, 1859, that work was begun on installing car tracks. Then the early idea that electric power would result in exceedingly low operating costs not only caused a rapid change of the then horse and cable roads into electric lines but prompted the building of additional parallel and competitive lines. Today nearly every American city has more trackage than is warranted by its population.

C. D. EMMONS

Not long after the general movement toward the consolidation of city service systems and their rearrangement to give the maximum service to the car-rider at the least cost, conditions were further disturbed by the advent of the jitney craze in the year 1915. The experiences of Bridgeport, Toledo and Des Moines are recent enough to be fixed firmly in the minds of the entire country, yet there are still many sections that have not as yet taken any active steps to conserve for their citizens a co-ordination of the transportation facilities, such as will in the end make for the best transportation for the least money—a result, I am sure, all fair-minded citizens, as well as the operators of city service, are anxious to attain.

TRANSPORTATION METHODS IN LONDON

Having heard a great deal about the possibility of the motor bus finally supplanting the street railway systems of our cities, and with the often repeated statement that it is being done in London and other English cities, the writer, accompanied by the vice-president of his company, made a trip to the British Isles during last summer. Instead of the buses supplanting the street railway, we found a firm conviction in the minds of the English people that proper city service could not be given at a minimum fare unless the entire

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service of the city is co-ordinated under one agency, whether this agency is a private company, as in London, or a municipality, as in Birmingham, Liverpool, Glasgow, Edinburgh and other places visited.

When one first reaches London and is driven through the streets in a taxicab to his hotel, he is forcibly struck by the absence of street railway track in what is known as "Old London," which is the name applied to the present financial district of the town, about 1 mile square, and with a day population of approximately 400,000, and with a night population of about 20,000.

A short study of "Old London," with its very crooked, narrow, never parallel and ever dead-ending streets, soon convinces one of the impossibility of street railway tracks in that district. The only way to have a tramway in this section is underground. The underground railway system of London is very extensive, and under the guidance of our eminent ex-member, Lord Ashfield—formerly familiarly known to us as "Al" Stanley and now chairman and managing director of the London Electric Railways and Associated Companies—an excellent and satisfactory service has been developed.

Being a firm believer in the co-ordination under one management of all transportation facilities, with a wide degree of public regulation of such management, Lord Ashfield has succeeded in consolidating ten different underground and tramway companies with the London General Omnibus Company, operating in Old and Greater London. He has even gone so far as to secure a co-ordination of transportation facilities through the arrangement of the London General Omnibus Company for through bookings with the London County Council Tramways at the tramway dead ends in the various communities. This co-operation is noteworthy for the reason that for years the London General Omnibus Company and the London County Tramways (a municipal undertaking) have been bitter competitors.

Further, as a means to better the service to the public, the advisory committee of the Ministry of Transport, in its special regulations for buses, provides that buses may not be hailed at any point, but must have four definitely marked regular stops and two optional stopping places in each mile of route. This total of six stops a mile compares with our total of ten to fifteen stops a mile and helps greatly in the average speed per hour of their buses.

It has been often said that the traffic of London is handled by the bus service. A visit to Old London and the observance of the enormous morning and evening rush to and from the underground railways will soon dispel this idea as well as that of the possibility of any bus service in the narrow London streets being able to cope with the problem of the mass transportation in the rush hours.

During the normal hours of the day the buses are very popular, and it is not surprising that when the figures of the entire traffic of Greater London are put together, it is found that the buses carry approximately 30 per cent of the total, while the underground and suburban railways carry about 40 per cent, and the tramways about 30 per cent. The consolidation of the buses with the underground has permitted very economical dispatching to conform to weather conditions. On rainy weekdays the traffic on the buses falls off approximately 25 per cent as compared with a good day, and on a rainy Sunday it is barely 50 per cent of a good Sunday. Fewer buses and more subway trains are, therefore, run in bad weather, and vice versa.

British Fares and Practices

The charge for the rides in London, as well as in all other places throughout the British Isles, is based on the zone system, wherein a minimum fare of from 1d. (2 cents) to 2d. (4 cents) will permit a ride (varying in different localities) of from one-half to 1 mile, with increasing rates for longer distances. The short rides may be cheap, as is often declared in America, but one taking long rides, such as is possible in any of our American cities, and as were taken by us in London, must pay as much as 48 cents, though in New York a ride for the same distance would cost 5 cents, and in other places from 7 to 10 cents. To take care of the increased cost of operation, the minimum fare for the shortest ride, which had formerly been 1d., or 2 cents, has been raised 50 per cent to 1½d., or 3 cents. This 50 per cent increase caused a falling off of short-haul traffic of only 4 per cent.

In London is the largest development of bus operation in the world. There are approximately 3,000 buses carrying close to one billion passengers each year on about 150 different routes. We were, however, very much impressed with the fact that the London buses themselves do not compare, either in looks or in riding qualities, with the late types of buses used in this country.

In Birmingham, Liverpool, Glasgow, Edinburgh, York, Leeds, Bradford, Sheffield, Nottingham and other cities, we found the city tramway systems owned and operated by the municipalities themselves, and in every one of these places, with the exception of Edinburgh, experience had taught that to give proper service to the people at a minimum cost, it was impossible to permit real competition of buses with the tramways. Where such competition had actually been started in any of these cities, the competing companies had finally been purchased and the cities were so operating these bus lines that they were an auxiliary or an extension service instead of a competitive service.

In cities such as Birmingham, where outside bus lines were permitted to enter and operate in the city, an extra high initial fare has to be charged on the buses where they overlap the tramway in the center of the city, in order to prevent competition with the tramway service and reserve the buses for long-distance travel.

We were greatly impressed by the serious lack of progress shown in the development and standardization of the city tramways. For example, track gages range from 3 ft. to 4 ft. 8½ in. Our American cities, however, are not free from this criticism.

The cars are largely single-truck double-deck cars which have been in use in the English cities for the last twenty years, most of the managers priding themselves on strictly adhering to a standard. This attitude in our country would be very quickly put down as non-progressive. We saw in the British Isles absolutely no modern cars such as our present prepayment cars, the Peter Witt or center-entrance trail cars, or one-man type of cars.

Again we were impressed with the small amount of trackage in the various cities, which shows, in comparison with an American city, a great lack of service to their people. For instance: In Birmingham, a town of 900,000 inhabitants, there are only 130 miles of single track, or about 1 mile to every 7,000 people. Liverpool, a city of 800,000, has only 120 miles of track, or 1 mile to every 6,600 people. This same ratio prevails throughout the cities of England. In our American cities, the ratio apparently runs from 1 mile to approximately every 1,500 people up to 1 mile to every 2,500 people. In Baltimore we have 1 mile to every 1,800 people.

Number of Revenue Passengers per Mile Is High

This lack of mileage in the British Isles causes a very highly saturated riding condition, so that their revenue passengers per car-mile will run from fourteen to sixteen, while in our American cities we have from about five to eight revenue passengers per car-mile.

On account of the double-deck single-truck cars, the apparent speed is very low, but because of the long distances between stops, they are able to make an average speed of approximately 8 m.p.h.

One feature that greatly impressed us was that even with the open platform and steep and winding stairway of the double-deck car, producing great liability to accident, the accident ratio in most of the cities is very low. Apparently the ambulance-chasing lawyer and the malingering claimant have not as yet developed in such numbers in England as we have them in America.

The English people are very patient and easily submit to the necessary time and trouble taken to collect and check up the zone fares. They are also most patient and readily co-operate in carrying out the system of queue loading.

The operating costs, as given us by the various managers, are interesting, but differ to such an extent that we feel they are not altogether comparable. For instance, in Birmingham, we were told of an operating expense per car-mile for the tramcars of 38.88 cents

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and for the buses of 45.18 cents. In Liverpool the figures for tramcar operation were 47.82 cents and in Glasgow 43.22 cents. Again in Edinburgh, we were given the figures: 30.806 cents for electric operation, 41.804 cents for cable operation and 39.26 cents for bus operation. In York, we were given 35.58 cents for electric operation and 23.06 cents for trackless trolley operation. In Leeds the costs were 34.40 cents for electric operation and 28.50 cents for trackless trolley operation. In Sheffield they were 35.96 cents for electric operation and 46.54 cents for gasoline bus operaton.

In conversation with James Dalrymple, general manager Glasgow Municipal Tramways, who is the outstanding figure in tramway operation in Great Britain, we asked him if he had any reason to change the statement he made in America some years ago to the effect that he thought it would be inadvisable for American cities to operate their transportation systems themselves. He stated that he had been quite convinced, after a careful study at that time, that it was not advisable, and he said he has found no reason to cause him to change his mind concerning the desirability of private ownership and operation in American cities.

In England operators are not at all agreed among themselves as to the best method of handling city transportation.

H. E. Blain, managing director London General Omnibus Company, is now, always has been, and likely always will be, convinced that the gasoline bus is the best method, but he admitted that it was necessary to have a subway system, or some other such system, to take care of the mass transportation of the morning and evening rush-hours. Mr. Dalrymple is a standpatter for the use of the tramways. As yet he has no buses or other forms of transportation in Glasgow, although he admits it is likely he will install some bus lines in the future to avoid the heavy cost of present-day construction of tramway extensions.

Mr. Pilcher, general manager Edinburgh Corporation Tramways, is now using buses to supplement car service.

In York, they are using a trackless trolley for the purpose of augmenting their present service.

In Leeds, in places where good roads are available, Mr. Hamilton is using gasoline buses for his lightest traffic and the trackless trolley for medium traffic, but he feels that the tramway must be the backbone of the transportation system.

Mr. Wilkinson, general manager Bradford Corporation Tramways, is a strong advocate of the trackless trolley, and feels that this is the only method to supplement and augment his tramway service, which must bear the main burden of the transportation service.

Curiously, at Sheffield, the very next city we visited after Bradford—and quite adjacent to Bradford—Mr. Fearnley, general manager Sheffield Corporation Tramways, is just as strong an advocate of the gasoline bus as Mr. Wilkinson of Bradford is of the trackless trolley. Sheffield, with its population of 500,000 people, has only 79 miles of track, or only 1 mile to every 6,300 people, so that Mr. Fearnley has quite an opportunity to supplement his tramway service with other forms of transportation.

In a paper presented at the conference of the Municipal Tramways Association in 1919, Mr. Fearnley expressed himself as follows:

1. The gasoline motor bus is an excellent vehicle in acting as a feeder to tramway routes.
2. The gasoline motor bus is an unsuitable vehicle for satisfactory dealing with heavy town traffic.
3. The gasoline motor bus is quite inadequate for dealing with Sheffield peak loads.
4. The gasoline motor bus is financially impossible at tramway rates of fare.
5. The gasoline motor bus has no advantage over tramways in regard to average speed maintained during the day.

If nothing else, the result of our trip emphasized in our minds the following outstanding facts:

1. The English transportation systems, with the exception of the London Underground and the London General Omnibus Company, were very much out of date, and we came back to America with the idea that the English people could learn very much from a visit to us.
2. Predominantly, it is the outstanding conclusion of the citizens of the various cities visited that, to obtain the best service for its people at a minimum cost, there is only room for one transportation system in any one city, whether operated by a private company or by the municipality itself.
3. That in American cities, a complete, comprehensive and satisfactory transportation system, at a minimum cost, can be secured only by means of the control of all city transportation agencies in the hands of one management.

Auto Bus and Truck Good as Interurban Feeders*

By Harry Reid

President Indianapolis & Louisville Traction Railway, Indianapolis, Ind.

The Author's Interurban Railway Is Arranging for Joint Tariff Rates with Bus and Auto Truck Lines—Considers Them Desirable When They Act as Feeders

PROBABLY many of you know that I am opposed to the motor bus and the freight handling truck as competitors of the electric interurban railway and feel their business should be regulated on the same principle that two gas, two electric or two water companies are not allowed to compete, unless they did so before regulation was provided. I believe that our interurban business, to be successful, must also operate as a natural monopoly. In Pennsylvania, for example, no bus or truck line can operate in competition with an interurban railway unless it first obtains a certificate of convenience and necessity from the Public Service Commission.

HARRY REID

I am, of course, a friend of trackless transportation where it promises to become the forerunner of an interurban line.

If trackless transportation is established, its charges should be regulated by proper authority so that no injustice may be done to public, interurban railway or truck. In addition to this regulation, the bus or truck should pay a special license tax, not only as a compensation for the damage done to the roads which the interurban helped to build, but also as an off-set to special tax burdens placed upon the interurban industry.

I have said that these transportation agencies should be eliminated as a competitor of the interurban. On the other hand, I can readily see how they might be of great assistance as cross-country feeders to our lines. As a matter of fact, the company which I represent is arranging with certain motor bus and freight truck lines operating cross-country to our lines for joint tariffs naming rates and points reached by the interurban and truck or bus lines which both the Interstate Commerce Commission and the Public Service Commission have indicated their willingness to accept, provided the company furnishing the tariffs assumes the responsibility for shipments over the entire route. This can be accomplished by bonding the truck or bus line when each joint tariff is filed, so that the company filing the tariffs would be protected fully.

A large amount of high-class tonnage can be created for the interurban and a service can be rendered to the rural districts which will prove of mutual benefit to the interurban company and the inhabitants served. This policy will also tend largely more rapidly to develop the outlying territory. A development of this nature will establish an outlet for farm products from interior points, located on truck lines, to town and city markets which heretofore have been inaccessible. In turn, such a policy will make it possible for interior points to get their supplies with less effort and smaller expense and

*Abstract of paper read at eleventh Mid-year Meeting of American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

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operate toward the general development of these rural territories, opening up new fields of industry, which, due to lack of transportation facilities, have been wholly inactive.

Live stock is being transported to a very considerable extent by the several interurban companies entering Indianapolis. The motor truck may be useful as a feeder to the interurbans in bringing live stock from the farm to the nearest interurban point, and this practice would also be true of dairy products, garden truck and fruits.

The co-ordination of trackless transportation with the future service of the electric interurban means a more thoroughgoing development of the territory served and for a much wider scope than has heretofore been possible, but only under conditions, such as I have outlined, can I see any benefit to be derived by our industry from the trackless transportation business.

California Situation Regarding Rail and Trackless Transportation*

By Paul Shoup

President the Pacific Electric Railway, Los Angeles, Cal.

Intensive Competitive Development Has Produced Acute Condition—California Railways Protest Free Use of Roads by Bus Carriers—A Small Number of Supplementary Services Recognized as Legitimate

PAUL SHOUP

OUR experience in California so far has been chiefly one of competition and not of co-ordination, eliminating the trackless trolley system, which as yet has no place in our service. It is true that a trackless trolley operated in the Hollywood section as a feeder to the Pacific Electric for several years, the service being discontinued because it was unprofitable some ten years ago.

Dealing first with the question of trackless trolley, the studies so far made by us indicate that it should be approached only from the viewpoint of temporary use as a connection of the track service and that the construction of overhead and rolling stock should be with the end in view that ultimately the tracks may be extended to supplant the trackless service. A second essential condition is that the streets over which such trackless service is given be paved, and the third, that the franchises be of a nature that will place only light obligations upon the operating company. The failure of the Hollywood trackless trolley, which was quite thoroughly investigated by us at the time, was very largely due to the fact that the roads were not paved. Not only was power consumption large but the maintenance cost was excessive.

The tremendous cost of roadbed, track and paving under the present requirements of municipalities in our section is such as to make very desirable an escape from the use of rails if practicable. There is, however, a growing inclination on the part of the cities to realize that the paving burdens, aside from the question of roadbeds now imposed upon the electric railways, are not wholly proper obligations of these railways. The State Legislature of California at its last session recognized this fact by amending the law so that it is no longer mandatory on counties and municipalities to require the paving of streets for the space occupied and two feet outside thereof on either side by the electric railways. Since that time we have taken but one franchise, this replacing existing franchises in the city of Fresno, and Fresno has relieved us in connection with new construction from paving or from renewal of paving though not of roadbeds underneath.

It requires from $90,000 to $143,000 per double track mile to construct an electric railway in California under the varying requirements of the municipalities and obviously traffic has to be quite dense in order to earn an interest return and depreciation upon such costs. Pioneering can not be undertaken unless a large part of the cost is paid by the community directly benefited. The conclusion is therefore a logical one that pioneering without rails is the desirable form on streets under the conditions as they now exist and it may very well be that trackless transportation will find a very considerable field in that direction.

The important development in connection with trackless transportation in California has not been, however, one of co-ordination, but one of competition. The motor bus and the motor truck are the serious elements in this situation and not the trackless trolley. Indeed it is probable that the motor bus and motor truck have been developed as fully in California in proportion to the traffic as anywhere in the United States. This is due to a number of facts: first, that they can operate throughout the year with facility; second, that California in proportion to population has more paved streets and highways than any other section of the United States and, third, that an extensive development in California has made for a dense suburban and rural population in many sections. A minor factor has been that there are a number of sections isolated from railroads where the motor bus and motor truck have succeeded to the operations of the stage coach and the freight wagon, this being particularly true in the mountain regions and in some sections of the oil fields.

In considering the motor bus or motor truck either in co-operation or in competition with the electric railways, and for that matter the steam railways also, we must have in mind that they are now enjoying advantages which may very well disappear in large degree and it will not be at all safe to make investments upon the basis of present relations between these carriers and the public.

At this time the motor buses and the motor trucks have a very great advantage over the railways in California, whether electric or steam. The state, counties and municipalities have provided them not only with rights of way but with paved roadbeds at an expense of over $100,000,000. But the motor buses and motor trucks do not have to contribute to this capital investment. The state license fees for operation are, compared with the taxation of the electric railways, very light indeed. Out of every dollar taken in by the electric railways 5¼ cents is turned over to the state aside from local franchise taxes. Less than 10 per cent of the counties and municipalities as yet make any license charge against the motor carriers. Indeed, the paving paid for by the electric railways in the various cities is used by the motor carriers without any charge.

To repeat the statement made to me the other day by one of the most prominent newspaper owners, "The state is running its steam and electric transportation systems by providing parallel lines of transportation free to operators who have no other investment than in the vehicles they use and is at the same time increasing the taxes of these railways in order that these highways may be maintained and extended. Our highways were designed for private use, but with the situation as it now is the private use by the several hundred thousand automobiles and other motor carriers of private ownership is being rapidly subordinated to the use of these highways as common carriers. The ultimate result unless the situation is changed will be disastrous to everybody." The gentleman I quote is very largely interested in many sections of California and has had made for his own information a study of the situation.

How public sentiment is changing is

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shown by the fact that ten counties acting individually and seven counties acting through the San Joaquin Valley Supervisors Association have passed resolutions through their Boards of Supervisors urging the Railroad Commission not to grant any additional permits to motor carriers where they compete with the rail carriers, pointing out that they are not paying proper compensation for the use of the highways. Many Chambers of Commerce and other commercial bodies have taken similar action. Seventy-seven newspapers of the state have commented upon the destruction of the highways through their use as public utilities without proper compensation and the injustice done to the electric railways and the steam lines as well through this condition, which must ultimately react unfavorably upon the welfare of the State as a whole. The Railroad Commission has been making a thorough study of this subject, the power resting with it to grant or withhold permits for new operations, and it has found it desirable recently to turn down a great many more such applications than it has approved.

At this time it is costing to build highways in the State of California $50,000 per mile if they are to be of a nature to stand up under the heavier motor carrier traffic, and $30,000 per mile if these heavier weighted vehicles with loads be eliminated. The figures are those of the State Highway Commission, which has taken action repeatedly to call the attention of the people of the state to the fact that it is impossible to maintain the highways under present appropriations and that the situation must become worse and worse as the years go on if these conditions are not changed.

The far-seeing men in the automotive industry are realizing that you cannot "have your cake and eat it too." They know that the highways must be maintained or their industry must disintegrate with the highways. They are very much more concerned with the successful operation of the several hundred thousand privately-owned machines than they are with the relatively few number of motor carriers used as public utilities. There is among the owners of the private machines a feeling growing stronger and stronger against the highways being turned into roadbeds for public utility uses.

The conviction is becoming more general also that at the best the users of the highways are going to have to contribute in the way of license taxes much larger amounts than they have heretofore if these highways are to be maintained in a serviceable condition. They do not want this condition accentuated by any unnecessary public utility use or any public utility use that is not paid for properly. In other words, there is a feeling that all public carriers in their relations to the public should bear the same burdens in proportion to the service rendered in the way of taxation irrespective of the form the transportation takes.

Public sentiment is headed toward the conclusion that the state or any subdivision thereof should not on one hand contribute any more in the way of facilities to the passenger who moves by motor bus than it should to the passenger who moves by rail and on the other hand that the tax taken from the revenue derived by the carriers should be on the same basis in both cases.

Nowhere in California have any of the communities willingly given up electric railway service even where the motor bus has been most fully developed. Neither are they satisfied with the reduction in the steam railway service that has followed the establishment of these motor bus lines. In Fresno, where probably there are as many automobiles in proportion to the population as anywhere in the country and where there is a very large interurban bus service, the people are strongly opposed to any curtailment of the electric service in the city but instead are very insistent upon extensions of the lines and are dealing with the situation accordingly. Los Angeles by a strong majority in a referendum vote discontinued the service of jitneys in the downtown business section, which immediately eliminated all such service. Oakland, San José, Sacramento, San Diego, Stockton, Fresno, Bakersfield and some of the smaller cities, all at one time or another have had the "jitney fever" and have all recovered, there being no such service now in these cities except a very few lines serving sections isolated from the car lines. In San Francisco the jitney fare has been changed to 10 cents, and during the busy hours the buses are not permitted on an important section of the major business street.

We do not know just how prosperous the motor bus and motor truck industry is in California for the reason that as yet the figures furnished the State Railroad Commission are hardly comprehensive. There are about 800 individuals and companies operating under its jurisdiction at this time. Their investment is very small in comparison with their operating revenues, which for 1921 probably reached $20,000,000. The earnings of the principal companies for 1921 are not available, but the returns for 1920 show very small earnings and in the case of the two largest companies a deficit. If they paid taxes, maintenance charges and had to bear some fair proportion of the carrying charges on the investment in the roadbed used, the number that could continue operation would no doubt be very limited. Yet in the end it is altogether probable that they must submit to this business measure.

It is true that there are isolated communities having no railway service and which need and must have a motor bus and motor truck service. This condition it will be necessary to consider in the making of new laws.

We who are in the electric railway service have had occasion to study very seriously the accident problem and when we come to consider adding the motor carrier service to our present form of transportation we find that feature to be one of very great interest. During the first nine months of 1921 the principal motor carrier in California had 345 accidents and either directly or through the insurance company that was carrying its insurance during that year it had to pay out a very large sum of money. As the highways become more and more crowded with vehicles the difficulty of maintaining schedules and not having accidents becomes greater and greater.

Therefore when we consider the extension on any very considerable scale the trackless carriers as auxiliary to or successor to our present operations we find many reasons why we should proceed with great caution. Summarizing these are: First, the assurance of increased taxation either locally or by the state to the point where such carriers will be placed on a parity with railroads because of the absolute need of the public for more money to maintain its highways and the drying up of other sources of revenue for this purpose; second, the feeling on the part of the automobile using public that the highways are designed for private use and are not to be made over into roadbeds for public utility service endeavoring to maintain certain schedules, which almost necessitates their having the right of way; third, the growing belief of the public that the railway which it finds to be essential, steam or electric, should not be destroyed or deteriorated by a competition which divides existing business through the paralleling of lines and does not except in a limited way create new traffic.

The fact has become recognized that the public must eventually pay for the support of two forms of transportation, one of which may be made inefficient by the other without the newer form being able to give a satisfactory service. Coupled with this is the feeling that fair play demands equality of treatment as among carriers; and fourth, the fact that at the present time with burdens as light as they are the earnings of the motor buses have not been particularly profitable, and with other problems and increased use of the highways, more regulation and more taxation the prospect for the investor can not be said to be very alluring.

In California the electric railways have found the motor bus and the motor trucks a competitive form of transportation, taking advantage of our highway system, and very destructive to the electric railway interests, which as you know have had a hard enough time to survive the competition of the privately operated automobile and the great increase in the burden of their expenses. It is impossible for these electric railways with their experience, none being immune, to feel that the motor bus and motor truck transportation should be classed with them or that the suggestion should be entertained that the two be co-ordinated, since such co-ordination is absolutely

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impossible under existing conditions. Every electric railway in California has suffered severely from this competition. Each one has had to make its battle against the unfair features of such competition.

It is true to say that the cities generally, with perhaps only two exceptions, in the whole State, have concluded that in so far as city service is concerned they want the electric railways and they do not want the jitneys and so far as the two exceptions are concerned if it were possible to justify the extension of the street railway systems I believe they would be very glad indeed to dispense with the other service. A number of the roads under my jurisdiction have used motor buses as auxiliaries and to some extent we are doing that now, though in the northern cities the results were so unsatisfactory that we have discontinued their use. In connection with the Pacific Electric we are enlarging upon our experiments to give such auxiliary service a fair trial. But it is idle to talk of a community of interest between the motor bus companies and the electric railways.

In closing, I am asked to express one strong unanimous view of the electric railways of California. They have had a very bitter and costly experience in dealing with the competition of the motor buses subsidized through the use of highway systems of the state and its subdivisions. They strongly differentiate between the electric railways, which furnish all their own facilities, and the motor carriers, which furnish nothing but vehicles. They protest as with one voice in attempting to associate the interests of the two. This expression I know is not the result of our electric railway managements naturally having any different viewpoints from those that would be entertained by those elsewhere, but as a result of an experience that has been bitter and disastrous to the interests that they represent. Co-ordination between the companies of the one kind and the other under conditions that now exist cannot be brought about. In legislative questions, in the establishment of new laws, in the maintenance of parallel lines, in the existing inequality of treatment, the conflict is too bitter. Our views are not governed by any theory as to what should be, but by the hard facts that each day affect the bread and butter of our lines.

How the Manufacturers of Electric Railway Supplies Can Help the Industry*

By E. F. Wickwire
Secretary Ohio Brass Company, Mansfield, Ohio
Chairman Committee on Co-operation of Manufacturers

By Education of Employees of Manufacturing Companies to See Their Relation to the Success of the Electric Railways Much Good Public Education Will Result—Examples of What Some Manufacturers Are Doing

I HAVE been asked to submit to you this morning a brief report regarding the plans and activities of the committee on co-operation of manufacturers.

Most of the manufacturers who have heard of the work outlined by this committee seems to feel that it is a very excellent idea and they want to help carry it out. But when you pin them down, they don't seem to understand quite how to go about it, and many of them are afraid to ask.

I want to say right here, however, that those who have fully grasped the idea are doing most excellent work, which is very encouraging, and clearly indicates that the plan can be carried out successfully when properly organized and directed.

Your committee made up their minds in the beginning that they didn't want to follow up a theory that wouldn't work. But we've gone far enough to become satisfied that our theory will work, just as fast as it is really understood by the manufacturers. It has been said that a man is as big as the unit in which he thinks. It's time that we manufacturers of electric railway materials began to think in bigger units.

We should not think of our transactions with the electric railways as finished when we box up the goods ready for delivery—as the undertaker looks upon a corpse—he can't help his customer any more. But we should not overlook the fact that the electric railway is a public utility, which has been subjected to regulation, intimidation and strangulation, until in some places it is in danger of extermination; and we can help our customer, the electric railway, to remedy this trouble, if we will only make the effort, along the lines that your committee is suggesting.

But we must be careful about selecting the right remedy, and we must also administer it properly, or we'll spoil the effect. This is illustrated by the story of Casey and his friend Flannigan, who was very sick. Casey volunteered to sit up all night with him. The doctor instructed Casey to administer a certain powder every hour, starting at 10 o'clock, and to give him just what he could get on a dime and no more. He took a dime from his pocket and showed Casey the necessary portion and cautioned him against an overdose. The next morning when the doctor called he found Flannigan dead. He said to Casey, "Did you give him the dose I prescribed?" Casey said, "Of course I did, but I didn't have a dime, so I put it on two nickels."

Now, broadly speaking, what's the best way to help remedy the electric railway situation? I think Mr. Maxwell, in a talk which he gave in Cleveland the other day, came close to the mark when he said:

"To the extent that the public understands the underlying facts and principles of the utility industry and the conditions under which they render service, to that extent will equity and justice prevail in the public's regulation of its utilities."

But how are we going to get the public to understand? Why, by educating them. And can you think of a better way to help than by intelligent co-operation of the manufacturers with the electric railways, than by the pyramiding of their influence along well-directed publicity and educational lines?

I say well directed, because we should be sure that we understand the problem and how it should be worked out.

We should study this problem carefully and handle it right.

Now here is our theory—our plan to help solve the problem—briefly summarized:

If the manufacturers, whose prosperity is linked with the prosperity of the electric railways, carried the true story of the public utilities to the thousands in their own organizations, to their influential sources of supply, to their stockholders and to their public representatives, a tremendous energy would be put to work to get a square deal for the electric railways.

There may have been a time when many public utilities turned their backs on public opinion, but that time has passed. Public utilities are now courting public opinion, and we manufacturers are most certainly in a position to exert a strong influence to help win it.

We can help teach the public that transportation always has been and always will be a vital factor in the life

*Abstract of report of special committee on the co-operation of manufacturers presented at the Midyear Meeting of the American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

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and growth of this country, and of every community, and that it is entitled to their fair consideration and support.

I would like to take just a minute to draw your attention to a few concrete examples, indicating the ready response that your committee is getting from some manufacturers in connection with this work.

Here's a letter from an official of a large manufacturing company, addressed to this committee:

"DEAR MR. WICKWIRE: Attached find copy of my letter addressed to our local newspapers. The 'copy' that I sent to them was sent to us by the association.

"If agreeable to you, I would like to have your suggestions at any time until I get this matter thoroughly in mind and I will welcome any letters from you that may help, not only in our own publications here in the factory but in our local newspapers. Fortunately, we are in a position to receive their co-operation."

The man who wrote this letter is a "live wire." I know him. He's so energetic that if he had the "seven-year itch" he'd scratch it out in five. His concern employs something like 3,000 men. He's going to be a big help to us in this work.

THIS SHOWS WHAT CAN BE DONE WITH A LITTLE CO-OPERATION

Here's a little folder which was recently sent out by one of the large manufacturing companies to its stockholders. I'll read the last three paragraphs:

"The electric railway in your city may be large or small; it may be prosperous or in financial difficulties, but it is a part of a most essential industry. You may or may not have occasion to patronize the local line as a passenger, but in any case you realize how necessary it is as a community builder, as an element for increasing property values, as a means of transportation of the masses. What would your city have been without the street railway? What would happen to it if tomorrow all street railway service were permanently abolished?

"Thus, your co-operation in securing a constructively favorable public attitude of mind toward the electric railways in your community will not only result in better service for the people and in aiding the prosperity of your neighborhood but will also benefit you as a part of this organization."

This concern not only wants its stockholders to have *faith* in its business but *knowledge* regarding the electric railway industry, from which it secures a large part of its business.

Here's a little incident of a manufacturer of electric railway materials who writes that he found right in his own plant a foreman who was one of the most active agitators in town against the local traction company.

Of course a little reasoning with that foreman showed him where he was wrong. He simply hadn't realized that he was acting directly against his own interests. He was like one of those fellows whose mind becomes so intent upon injuring the man with the Twin Six that he neglects his own six twins.

Here's a manufacturer who writes that he put one of our educational articles into his factory publication and found that it aroused a good deal of interest.

But there was a fly in the ointment, because he discovered that some employees got the idea that he was trying to "whitewash" the local street railway service and that they must not complain regardless of what happened.

To offset this impression, he emphasized to his employees the fact that today the wise railway manager welcomes legitimate complaints and constructive criticisms, as against destructive demands on the part of the public.

> ***Mr. Wickwire said:***
>
> **If the manufacturers, whose prosperity is linked with the prosperity of the electric railways, carried the true story of the public utilities (1) to the thousands in their own organizations, (2) to their influential sources of supply, (3) to their stockholders, and (4) to their public representatives, a tremendous energy would be put to work to get a square deal for the electric railways.**

And here's a manager of a railway and lighting property who became interested in this question of manufacturers' co-operation and writes that a little observation caused him to find in one day two salesmen who stepped out of buses and walked into his office to solicit business. Of course they did it unthinkingly, because the buses happened to come along at the right minute.

But it was very easy for the manager to show them the error of their way, and they promised to live better lives.

Here is a quotation from the company house organ of another electric railway manufacturer:

"Some will say that street car companies do not give 100 per cent service. In some cases this is probably true. It is usually found that the management is trying to improve conditions and will welcome constructive criticism. But don't forget that putting cars in carhouses and substituting buses will not bring about the desired results.

"We of the company have an especial interest in this problem. We should see that the street car companies get a square deal. Almost everything we make goes to the public utilities—much of it to the street railways. If a railway goes out of business, we sell less material and there is less work in the factory.

"The welfare of each one of us is largely dependent upon the welfare of the street railways, don't forget that. When you hear some one say that the street car company should be put out of business it is up to you to defend your 'bread and butter.'"

All the examples that I have cited are excellent efforts along the right lines, and we can all find plenty of such opportunities if we will only observe, reflect and apply. But your committee feels that we should have a better organized, more concerted and properly directed working arrangement.

With that end in view, President Todd recently sent out a letter to all manufacturing company members of this association, briefly outlining the plans of this committee, asking for the co-operation of each manufacturer and for the name of the proper man in each concern to follow up the work in that organization.

The plan is that the home office of this association will shortly commence to send each manufacturer carefully prepared ammunition for use by the manufacturer in carrying on this work and we want this data to reach the man in each manufacturing organization who is in best position to use it to advantage.

It is gratifying to be able to say that the responses to President Todd's letter have already exceeded our expectations, but we want an answer from every manufacturing company member. So if you have not sent in your reply, please do so right away.

Recently the headquarters organization of this association has been shorthanded and too rushed to follow up this work as vigorously as it desired. But we are glad to report that the "decks have now been cleared for real action." Yesterday the executive committee indorsed a plan to arrange to have Labert St. Clair give special attention to the direction of the work outlined.

DON'T WASTE THE AMMUNITION

Mr. St. Clair is well known to all of us for his successes in public relation work. We certainly want to give him our hearty support, and not waste the "ammunition" he sends us, but "shoot it straight at the mark."

And, above all, please don't get the idea, or let your organizations get the idea, that your individual efforts will be too small to carry any weight in this movement. No effort is too small to count; it all helps. In short, it's the combined effect of all these seemingly small efforts that will get the big result we're after.

Like the small boy who had the flock of bantam chickens. They weren't laying very well, and the eggs were not large enough to suit the boy. So one day he had a bright idea. He got an ostrich egg, hung it up in the barn and lined up all the bantams where they could see it. "There," he said, "keep your eyes on that, and do your best."

That's all we ask you manufacturers to do—keep your eyes on the "Big Idea," and do your best.

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"First Aid" on Chicago Elevated Railroads*

By Britton I. Budd
President Chicago Elevated Railroads

A First-Aid Team Comprising Twenty Employees from All Branches of the Property Has Accomplished Wonders as a Part of a Comprehensive Plan for Interesting All of the Employees in Promptly Attending to Injuries of Even Minor Character

AN IMPORTANT feature of safety-first work in modern industry, which has not generally been given the attention it deserves, is "first aid." Practice of first-aid methods in an organization not only tends to reduce the number of accidents, through the education of the employees to the danger of carelessness, but when an accident does occur it minimizes the effects, lessens the period of incapacitation and sometimes results in saving human life.

On the Chicago Elevated Railroads, safety first and first aid have gone hand in hand since 1913. In that year we began, through our medical department, to place containers with necessary surgical and medical supplies in convenient locations for immediate use in case of accident. A five-man drill team was organized on the Metropolitan West Side Elevated Railway to aid the medical department in giving group lectures to the various classes of employees.

Follow-Up System Essential to Success

From this comparatively small beginning, a complete system of first-aid work was developed. From experience we learned that if the work was to be really effective, it would have to be organized and a system of discipline instituted to insure the proper maintenance of the equipment. A new style of first-aid box was procured, with a compact form of container and filled with supplies which experience had shown to be most essential in the treatment of injuries common to our employees.

These boxes are installed at convenient points along our lines, designated by a distinctive marker, to acquaint our employees with the location of the first-aid stations, where medical and surgical supplies are at all times available in an emergency. With each first-aid box, a United States Army folding stretcher and a woolen blanket were placed, also posters showing the Schaeffer prone method of resuscitation from electrical shock. The number of such stations was gradually increased, until at present we have 135 first-aid stations on the Elevated System.

To insure that these first-aid boxes are constantly provided with supplies, a plan of systematic inspection was worked out by the medical department and a check made of the weekly reports sent in by the men in charge of the individual boxes. A record is made and kept in each box of the name of the person treated, and the nature and extent of the injury for which the contents of the box had been used.

Britton I. Budd

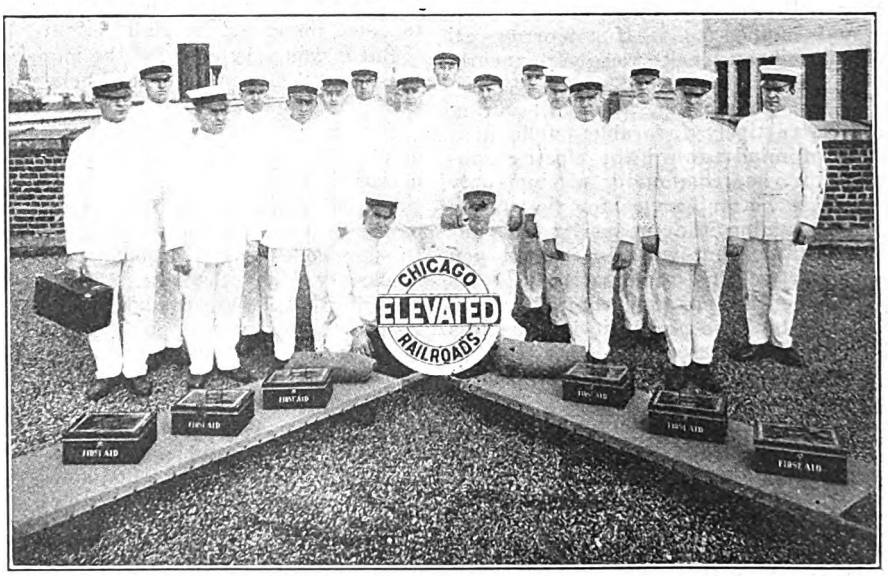
The next step was to organize and train the employees at the first-aid stations in the intelligent use of the medical and surgical supplies. Under the guidance of a physician from the medical department, this instruction was given to group classes of twenty employees. It included practical demonstrations, covering such subjects as resuscitation from electrical shock, application of splints to fractures, control of hemorrhage and proper dressing of burns and lacerations. As accidents frequently occur at places where a doctor is not immediately available, properly instructed first-aid men in many such cases are able to alleviate suffering and save life.

First-Aid Team of Representative Composition Organized

To extend this work and make it more efficient, the Chicago Elevated Railroads First Aid Team was organized. It is composed of twenty employees from all branches, selected by the heads of the several departments. In selecting this team consideration was given to personal appearance, length of service with the company, youthfulness and ability to assimilate the lessons in first-aid work and impart the instructions to others. Men interested in the work from a humanitarian point of view were given preference. These men, on being selected, attended a school of first aid, held in two-hour sessions twice a week, for a period of thirty hours.

In the instruction of the men the use of medical terms was avoided and the lessons were given in the simplest language possible. On completion of their course of instruction, the men were examined by the American Red Cross and each one was awarded a certificate. To supplement the class training, each man was brought into the medical department individually and spent one day in getting first-hand practical knowledge of the work.

The team has been organized for



First-Aid Team and Equipment. This Team Demonstrated Its Methods at the Midyear Meeting

*Abstract of paper presented at eleventh Midyear Meeting of American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922, preliminary to demonstration by Chicago Elevated Railroads' First Aid Team.

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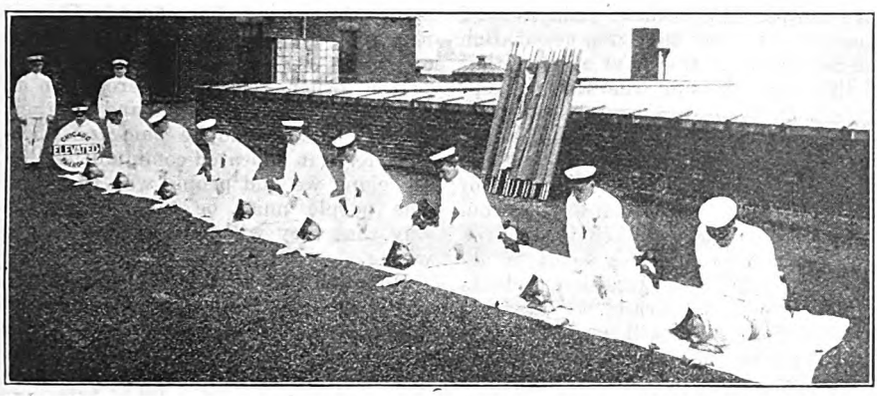

CHICAGO ELEVATED RAILROADS' FIRST-AID TEAM AT PRACTICE DRILL

five months. The men meet once a week, perfecting their drill work and increasing their knowledge. They have made a number of public appearances and are in demand in Chicago.

While the main purpose of the first-aid team is to render assistance in emergency, the members perform other valuable work among their fellow employees. They attend group meetings and instruct the rank and file. Members of the team take charge of the inspections of first-aid boxes. They make sanitary inspections and aid the examining physicians in making medical surveys of employees. The team has developed a number of men who are competent lecturers on first aid.

The results obtained from the organization of the first-aid team have been well worth while. Fatalities due to electrical shock have been eliminated, infections have been reduced to a point where it is rarely necessary to bring minor injuries to the attention of the medical department, and employees have been encouraged to give attention to seemingly trivial injuries, thereby avoiding serious complications. Two members of the team have been awarded medals for actually saving life, and two others have won medals in competition in first-aid work.

It is difficult to estimate the effect which the organization of the first-aid team has had on the morale of the employees. It has stimulated interest in the safety-first movement and in health measures of every kind. The men know that at any time of the day or night there is at least one man available to render intelligent assistance in an emergency until a doctor arrives.

Unfair Tax Burdens*

By Fielder Sanders

Formerly Street Railway Commissioner, Cleveland, Ohio

The Car Rider Pays the Tax, Either Directly with Service-at-Cost or by Poorer Service with a Fixed Fare —If This Is Understood Taxes Will Be Lower—Electric Railway Men Must Take More Practical Interest in Politics

ALL the peculiar imposts placed upon the street railways, from the park tax of Baltimore, the car license taxes, the mill tax and the pavement tax, down to the ludicrous tax paid for the maintenance of crossing cops, result directly from the way taxes are originated. They are levied in the same way by statesmen of large and statesmen of small degree, of all classes from township trustees to United States Senators. I might almost say that one favorite amusement of our public officials for many years has been to devise ways to raise money to spend. Most of the devices adopted are planned to be painless to the voters, whether so in fact or not. The result is that they are assessed against those who object least, or as someone feelingly said, "those who do not squawk." Street railway men are usually content to talk and to write to each other about the injustices of their taxes, but usually do not make their talk heard. The car riders usually know nothing about it. Nobody tells them. Farmers are heard, real estate operators, banks, municipalities holler, bondholders always, mercantile establishments, surely; but not electric railway riders or operators.

Theoretically, the public utilities should pay no taxes of any kind. It is hard, almost impossible, to draw a line of distinction between light, heat, water, drainage, pavement and street railway transportation as a facility of the free movement of men and goods. If the people have some of them at cost, or at least with taxation eliminated, why not the others, especially since the public opinion now is that the untilities should be operated at cost, including as a part of the cost a fair return on the money invested, and no more? But curiously enough, taxation remains as a part of the cost. We may hope that some day the light, now apparent to some few, will shine upon all our legislators and the exemption of all utilities from all taxation become a thing of being. It might not be amiss, while we are hoping, to do a little work along these lines. Utilities as well as individuals are saved not only by faith and hope, but by works.

FIELDER SANDERS

TAXES ARE PAID BY CONSUMERS

That these unfair taxation burdens are paid by the car riders is too axiomatic to discuss, yet, from my own experience of six years as a public official in your particular line, I have found it the hardest single thing to drive home to the public. The car riders' ignorance is not surprising, when you consider that they have been given the opposite slant for many years past. Yet the fact is simply that in service-at-cost franchises, taxation is a direct charge as a part of the rate of fare. In the companies whose rates of fare are regulated by public commissions, it is reflected a little more indirectly. In those unfortunate companies which are bound by a fixed rate of fare, the tax burdens are reflected in poorer accommodations and worse service to the public. So the car riders bear a part, if not all, of the burdens of this taxation. It is our task to make them know it, and when they realize it you have working for your interest, instead of against you, the selfish pocketbook interests of the millions.

I cannot and would not go into the detail of the many foolish burdens which are laid upon the car riders. Each city has its own. The mere statement of a few of them is enough to demonstrate the inequality. For in-

*Abstract of paper presented at eleventh Midyear Meeting of American Electric Railway Association at Indianapolis, Ind., Feb. 28, 1922.

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stance, the park tax, for the maintenance of breathing spaces for the people of Baltimore, of more than a million dollars a year, is paid by the car riders through the United Railways of Baltimore. Has anybody suggested that the automobile owner pay a tax for the upkeep of the parks? Yet in Cleveland, at least, the autoists use the parks more than the car riders. Paving taxes (in 1920) of more than a half million dollars in Philadelphia and Chicago; the great bill for street cleaning in Chicago and Pittsburgh; sprinkling taxes; car license taxes in Baltimore, Philadelphia and Buffalo; bridge tolls, more than one hundred thousand dollars in Pittsburgh; the mill taxes of hundreds of thousands of dollars in St. Louis and Cincinnati are examples. I have heard, however, that the fare got so high in Cincinnati that the public officials had to pass up the mill tax, at least temporarily. Franchise taxes also are a great burden in some states. All of these result in a street railway paying as high as 11.47 per cent of its gross income for taxes. Cleveland in 1921 paid 6.64 per cent, and we think we pay too much.

All these devices are frankly mere revenue producers at the expense of the car rider, and these taxes are as truly paid by the passenger as if, instead of one fare box there were two, one labelled, "for your ride" and the other "for taxes." It might be illuminating and interesting, where the taxation part of the fare is even money, say 1 cent in every 5, 6 or 7 cents, for the company actually to install two fare boxes, one for taxes and the other for the ride. I believe it would have educational value and produce rapid results in changing the viewpoint of the people.

As between the extreme views that the railway and the car rider should pay all taxes that can be assessed against them and that they should pay no taxes, it seems that a middle ground can be reached, i.e., that the passenger should pay only the cost of his transportation. The physical property used for his transportation may well be taxed as other physical property is, but the car rider, if he pays taxes on the value of the conveyance which hauls him, should not then pay taxes for the privilege of being in the conveyance. In Ohio, we believe generally in taxing property only, not the income from property. In New York, there is an opinion that taxes should be levied against net income. Whichever method is followed, the result to be had is that the customer should pay at least no more in proportion than the customer of any other business. Our customers do.

Enough of this recital. The second branch of the subject which has been assigned to me is how these things may be done away with. What can the speaker suggest?

How Taxes May be Reduced

Many practical men to secure a margin between income and outgo have advocated the hardest and most unpopular way, raising the fare; fewer have proposed a radical reduction of expenses. I think that this association has now come to the point of view that at this time, raising the fare, except where companies are grossly under a reasonable rate, must be abandoned. The other task must be pursued and expenses reduced by the elimination of unnecessary expenses, such as taxation. Until the railways establish themselves as governmental agencies so as to become exempt from taxation, efforts should be made to correct the taxation laws so that they will pay only the usual taxation on their property, such as paid by any of our good citizens.

In Cleveland, our company pays no license, paving tax or bridge tax and none of the privilege or occupational taxes. It is true we pay large corporation taxes to the State of Ohio, but no more than other corporations. Most of our troubles in Cleveland are with high tax valuations, so much so that three separate times the City Council of Cleveland has ordered the railway and myself as commissioner to combat in the courts and otherwise, taxes which in their opinion are unjust. We also pay federal income taxes, which in our case have amounted to great sums of money. This is an unjust burden upon the car-riding public, and Cleveland has directed the company to take all necessary steps to recover that money from the government. Perhaps the next annual convention of this association may have some very interesting views along that line.

One other branch of unjust taxes I should mention. It is the unjust removal of taxes from similar classes of securities. The market is flooded with tax-exempt securities, many of them securities of the same class of industry as railway securities. The result is the railways cannot sell their stock. This is a matter of great public interest to industries of all kinds. The street railways are not alone in this battle. Powerful influences are now moving to correct this evil, including the President of the United States. Every business man in the country should be associated in the effort to relieve this situation.

Take More Interest in Politics

So we are confronted with the question of how the unjust burdens may be removed.

One way is for each utility representing its stockholders and car riders to take a speaking and working part in the great taxation reform movements, which are going on in several states as well as in the United States Government. Again, something can be done in securing a favorable construction of existing tax laws. Employment of expert lawyers and tax experts and their appearance before tribunals may secure in some cases an interpretation of existing laws in the car riders' interest. We are now trying that before the Federal Court as to income tax. But if you find that the interpretation of existing laws is futile, then the real fundamental basis of all unjust taxation of public utilities should be removed by curing the cause. This is primarily the idea that the right to operate a utility is a special privilege to the owner thereof in derogation to the rights of the people and to their damage and should be paid for liberally. Even in educated communities like Cleveland we find people who think so. The people must be told in such a way that they will believe that this is wrong.

How can this be done? Advertising, publicity, etc., help, but in the last analysis public opinion must be changed. How? By getting into politics and mixing in your organization the leaven of the common people. My statement may sound rough to some of our sedate brothers, but I mean that the utilities have always operated at arm's length from the people.

Politics means not only long-distance interest in government (which doesn't count), but neighborhood activity (which does). I don't mean any slush fund, or the doing of the many things of which the people accused the utilities years past. That was wrong. But I mean politics as an officeholder, a politician, understands it—the influencing of people to vote for what is right and demonstrating to the voters that what you want is right. Such politics does not wait until your legislators and governors are elected and then sends skilled lawyers to appear before the committees. The damage is usually done when that time arrives.

The politics I mean is the identifying of yourself and your people and neighbors through neighborly helpfulness with the average man of your neighborhood and your city; taking the part you have a right to take in your improvement associations; voting for your representative on party committees (either party will do); voting for your ward councilman and state legislator. See that your honest neighbors who are reasonable men are chosen. See that they are pledged to the right treatment of yourselves. Make yourself part of the day-to-day life of your town. Have some homely companionship instead of the aloofness which characterizes too many of your organization. Establish a department of politics as a part of your day-to-day work. It is the most important part. Call it a department of public relations, if it sounds better to you. One of your successful men, Samuel Insull, stated most aptly the other day:

> I would like to refer to the question of publicity and public relationship. That is a subject which is the manager's job, the president's job, the chairman's job. It is of more consequence to your properties than everything put together.
>
> There has been a great deal of discussion in all the various public utility businesses on this subject for a number of years past. The tendency of a great many of us is to push that matter over to the other fellow; to let one of our subordinates look after it. But there is no more important task. It is important beyond even the raising of capital for the business, because there is no use in raising capital, or trying to, unless the public relationship is with you, and unless you establish such relationship with the public so as to insure the safety of that capital. For involved in the safety of our capital, the development of our business and the permanency of our business, above everything else is the question of public relations.

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He is right. The American public is fair. It can be trusted to do the right thing, if it knows what is right. If you can show the car riders of your city what these taxes mean, you can secure back of you the human selfishness of millions of car riders, working for their own interest.

There are signs now evident of increasing fairness in the opinion of the American people of street railways, but not yet does the man in every other business fully appreciate that he is riding on his own trolleys and the expense is as he make it, but he is coming to that knowledge. When he gets a proper perspective of the matter your difficulties will be over.

As a Commissioner Sees the Issues*

By Hon. J. W. McCardle
Chairman Public Service Commission of Indiana

A Frank Talk on the Basis of Valuations, the Proper Rate of Return, Tax Exempt Securities and Publicity, as They Concern Electric Railway Operation—Keeping the Public Advised Is the Prime Requisite

THE Public Service Commission of Indiana is glad to participate in the proceedings of your 1922 Midyear Meeting and to welcome you to Indianapolis, which I imagine was chosen as the meeting place this year as a compliment to your distinguished president, a resident of our State and city.

You gentlemen represent an industry that has suffered tremendously in loss of business prestige, earnings and credit within the past six or seven years. Jitneys, automobiles and soaring costs of operation have all but demoralized your management and paralyzed your physical equipment. I think you have deserved much better luck.

I know very well that while organizations and associations of the character of the American Electric Railway Association are trained to praise regulation as a very necessary institution, individually and privately most of you are inclined to look upon it as a necessary evil to be endured because it cannot be avoided.

Between ourselves, don't you still say to each other that your business is being interfered with by the politicians? And don't you look upon the personnel of regulatory bodies as a lot of greenhorns and upstarts or, to take the most charitable point of view, don't you look upon us merely as a lot of well-meaning but misguided and misinformed office holders? While we are trying to justify an increased rate of return on sound economic principles, have you not your minds still fixed on the forerunner for all the other principles of rate making, namely, the principle that you are entitled to collect all the traffic will bear? I believe you would be something less or something more than human if you were not so constituted.

Out of the war era from which we are still emerging but from the effects of which we will not escape wholly for a great many years to come, there have arisen new problems to engage our most serious attention, to baffle, and in some instances to confound us.

*Abstract of paper presented at eleventh Midyear Meeting of American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

HON. J. W. MCCARDLE

If it takes $1.50 to buy the same merchandise which before the war cost only $1.00, the purchaser must be provided with $1.50 if the merchandise is to be had, and if the purchaser happens to be an electric railway or public utility, the rate payer or passenger must put up the extra 50 cents.

CONDITIONS UNDER WHICH CURRENCY INFLATION CAUSES DISCOMFORT

It is only when the rate payer or rider fails to earn at least $1.50 in place of the dollar he formerly earned that "inflation" works a hardship. The farmer now is in the position of buying in a market of high prices and selling in a market of low prices. The values of farm products have been paralyzed by the complete disappearance of an export demand for our supplies, and farm products have fallen below even the pre-war level. The fact itself suggests the result. Farmers are seriously embarrassed financially and are complaining bitterly. They make the problems of the Public Service Commissioner extremely difficult so far as these problems touch the farmer's purse.

Within the past year we have heard frequent complaints against the tendency to allow the utility the benefit of increased values that arise from applying higher average unit prices to inventories of physical property in the reproduction method of valuation. Some of the objectors have referred to this increased value as an unearned increment. It is not an unearned increment in the ordinary acceptation of the term but an increment in name only. It is an increment represented by a larger number of dollars which have the same purchasing power as the lesser number heretofore.

Before the war, regulatory bodies had fairly stable standards and methods of evaluating privately owned property dedicated to public use.

Before the war it made little difference whether we used present prices or the average unit prices of three, five, seven or ten years in our theoretical reproduction of an inventory of physical property. The result was the same because prices were reasonably constant. Present prices or average unit prices for three years, five years, seven years or ten years ending with 1920, however, involve a maximum variable of more than one-half in the two greatest extremes. The year 1921 shows a material recession in prices—copper, for instance, touching a new low level. In the midst of this apparent confusion, there is reliable authority for believing that the new price level—one that will be sustained for many years—will be very much higher than the prewar price level. There is some authority for believing that it will be 50 per cent higher than the prewar price level. Whether it is 50 per cent, or 40 per cent, or 30 per cent lighter than the prewar price level, regulatory bodies may use average unit prices as much higher than prewar prices as the new level is found to be higher than the old. No one will be injured as a result of this policy. In fact, an injury both to the utility and to the public is likely to ensue unless such a policy shall be adopted.

PUBLIC NEEDS EXPLANATION OF NECESSITY FOR RATE READJUSTMENT

There is a danger at this time, however, of undertaking to establish values altogether out of proportion with prewar values. The public is prone to believe that such a tendency involves taking something away from the rate payer and giving it to the public service corporation. The average person is likely to regard such a tendency as vicious without ever stopping to consider that a new price level has been developed as a consequence of the war. Either we have got to take particular

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pains to explain the significance of this new price level to the rate payer or proceed very cautiously in recognizing it at all as an economic factor in evaluations for rate making.

What Is a Reasonable Return?

Before the war, when a well-managed utility could sell 5 per cent bonds at par, 6 or 7 per cent was considered a reasonable rate of return. Let's see what have been the results of the war when viewed from this angle.

Due to the delay of the utilities in seeking increased rates and fares, the delay caused by uncertainty at the outset of the war, and the delay finally caused by the inability of regulatory bodies to dispose of petitions for increased rates and fares promptly, even in the case of the best managed utilities, half or more of the 6 or 7 per cent return was wiped out by increased operating expenses in the early days of the war. Most of the utilities came through the war with a return of less than 4 per cent, which the bondholder and stockholder found to be worth less than half of what it represented in purchasing power before the war. In other words, the 6 or 7 per cent return shrank to less than one-third of its former value.

Is there any reason why, when refunding became necessary or when new capital was sought for additions and extensions, the former bondholder and stockholder should have been expected to put up the money? They were thoroughly disgusted when their own income was reduced by two-thirds while all around them were the profiteers operating with little or no restraint or regulation. Even the farmer in this period was enjoying returns of three and four times the normal return.

I believe anyone will agree with me that a 7 per cent return upon $150,000 is equal merely to a 7 per cent return upon $100,000 if $10,500 in the first instance will buy no more than $7,000 in the second. Nor is the rate payer being hurt if he, himself, is earning $1.50 where he formerly earned only $1. He is benefited or damaged by the "inflation" of values in the same degree as every other person or enterprise.

What has happened to public utility credit as a consequence of the war?

Seven and one-half and 8 per cent bonds have replaced 5 per cent bonds, and the former cannot be sold except at a heavy discount, the money costing the utility from 9 to 11 per cent. What has become of the margin between the interest rate on your long-term bond and your 6 or 7 per cent rate of return? The margin not only has disappeared but it has become a minus quantity. In other words, the interest rate on your new bond, sold to refund a maturing 5 per cent bond or to finance absolutely necessary improvements, exceeds by from 1 to 5 per cent the old rate of return, an adjustment which has thrown the whole structure of public utility finance out of joint but an adjustment which regulatory bodies have been powerless to forestall or prevent. So far as this condition is to continue permanently, simple justice demands an increased rate of return. Not only simple justice to the utility demands an increased rate of return but the public interest likewise.

I am in active sympathy with the assault that is now being made upon tax-free securities. Within the past twenty years the country has been flooded with securities of this character. My own notion is that if we were able to put these public obligations on the same tax basis as other securities, they would immediately lose a good deal of their attractiveness and not only would the standing of public service corporation securities be improved but public officials would find it more and more difficult to pile up the public debt. Any restriction or limitation upon tax-free securities automatically would result in restricting and limiting, to that extent, expenditures from the public treasury because the investing public would be reluctant to buy them.

Industrial expansion within the next twenty years will depend, in my opinion, more on the development of cheap electrical power than on any other single factor. We have got to make the development of electric power attractive to the investor or his money will go elsewhere. Here in Indiana, the Public Service Commission is doing everything it legally and morally can do to encourage this development in the sincere belief and confidence that it will redound to the benefit of the whole State. We take pride in what we have done already in this direction.

In the operation of electrical railways, as I understand it, from 20 to 30 per cent of the total operating expenses are incurred in the production or purchase of electrical power. Any material saving in this item is of very great importance in the cost of street railway service and therefore has a substantial bearing on the gross income of a particular company and the rate of fare paid by the public.

Company Publicity Helpful to Commissions

I believe that if the American Electric Railway Association were able to convince the public that under a regime of regulation it is impossible for the electric railways to take anything away from the public to which the electric railways are not entitled, your problems and our problems would be very greatly simplified. It is unfortunate that mutual suspicion and mistrust still prevail as between the public and the public service corporations and yet it is only through the elimination of this suspicion and this mistrust that reasonable fares and public co-operation can be had.

How can it be done?

By keeping the public advised of your business.

The average person is perhaps unable to understand the corporate balance sheet or income statement, but the average person is able to understand a newspaper story which tells the story of your financial operations. The public does not believe you are losing money in operating electric railways and will hardly believe you are losing money if you make the statement only once and let it go at that. You will have to keep telling the story, as well as the story of what you are doing to make the public comfortable. The newspapers will be generous enough to print your statement and to keep printing it if you can put some human interest in it. The public wants good service, and if you can drive home the connection between comfortable transportation service and reasonable fares, the public will pay reasonable fares with very little complaint. It is only an uninformed and ignorant public that any of us need worry about.

Of course, the thorough education of the public is a tremendous job. The public does not mean to be unfair, and it is only its failure to comprehend the truth which causes trouble. The same people will relieve a publicly owned utility from taxation. pay exorbitant rates and endure poor service, and at the same time they will harass the privately owned utility which pays its share of taxes, operates at reasonable rates and furnishes good service. This is not because they mean to discriminate but because they are unable to make a fair comparison between the publicly and the privately owned utility.

As a public service commissioner, I have run into too many cases of mismanagement and inefficiency in the field of the municipally owned and operated utility to believe that public ownership is any guarantee of good service at reasonable rates. On the contrary, we are generally surprised to find a publicly owned utility that is also well operated. We find altogether too much inferior operation and management among the privately owned utilities, yet the cases of intolerable operation and management are comparatively few.

It has occurred to me that the preparation of comparative studies in the field of publicly owned and privately owned utilities and the dissemination of absolutely accurate information which the public can understand would prove very helpful. I am sure the public would welcome this information. It will depend somewhat upon its being kept wholly impersonal.

May I say that we are all entering upon new experiences in the field of business? Transportation is more particularly an adventure today than ever before. We cannot be absolutely sure about anything. The business in which you are engaged particularly is filled with uncertainties and doubts. You have passed through trying times already. The future is not inviting. Let us hope that with wise counsel in high places we shall be able to weather the severest storms. Let us hope that we shall be able to approach all our great problems, and especially that of transportation, with mature self-restraint, with seasoned thought, with vision and with courage.

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"A Bond in Every Home"—The Woman's Viewpoint*

By Antoinette Funk
Attorney at Law, Washington, D. C.

The Entrance of Women Into Affairs Means Much to Electric Railways and Other Public Utilities for It Is Principally the Local Institutions and Service in Which Women Take a Direct Interest —Women Have a Large Purchasing Power and Through Them Securities Should Be Distributed to the Consuming Public

I WAS originally entered on the program to speak on the subject, "The Woman's Viewpoint," and I see now that the subject has been changed to "A Woman's Viewpoint of Electric Railways and Electric Railway Service." As a matter of fact, I was called up from New York and told I was to speak on the subject "Why a Woman Gets Off a Street Car Backward," and I was ready to make a speech on the subject, "Why Women Do Not Get Off a Street Car Backward," because we are the one-half of civilization who watch our step and are looking forward. The opportunity to show that was taken away from me when I read on the menu card this evening the subject, "A Woman's Viewpoint of Electric Railways and Electric Railway Service." I have never made, in my lifetime, a great use of the titles given me to speak upon. I think, indeed, that they are sometimes a polite suggestion from the committee as to what should not be discussed.

So I shall make my remarks without reference to the subject printed on the program, for I think what you want me to talk about are not electric railways. Why should I talk to you on that subject, to you who know everything in the world that is to be known about electric railways? What do you care about my point of view on electric railways. What I believe you want me to say is a few words, perhaps, on what it means now that all of the women of the United States are into everything.

It is only a short time since I met in Washington a member of one of the national committees of one of the great political parties, and it happened a short time afterward that I met the chairman of the national committee of the other party. I had known both men for some time and they stopped and talked politics with me, so they said, but what they really said was, "How do you suppose the women would feel if we do this, that or the other thing?" I said, "The trouble with you men when you get away from your own firesides, so to speak, and get into spheres where there are large numbers of women concerned, you lose your good sense. You seem to forget we

MRS. FUNK

are individuals, the same as you are. You have an idea we are a sort of composite body, and you begin to think of some kind of a gewgaw or a stick of candy which you can hand to us and we will be pleased. We have just as many opinions and viewpoints and as varied feelings as men have, and we differ just as much one from another as you men do; as a matter of fact, I think we differ more. Take a group of seven or eight men, and you will find that sometimes such a group of men will be divided in their opinions so that they represent seven or eight different opinions, but if you get seven women in a group, they will have eight opinions, one for each woman and one for the group.

So you see, there are no very broad laws or viewpoints that control the actions of women, but there is a certain trend in affairs that has been brought about by woman's entrance into the broader fields of American life, and I think that is a fortunate thing for such men as you here tonight, who are interested in great undertakings of such public importance as the electric railways.

I understand that the electric railways of the country, along with other industries, are undergoing a period of readjustment, and I think that it augurs well for the electric railways that this period of readjustment comes at the time of women's active entry into the field of affairs. I really think it is a wonderful thing. I am not here just to be complimentary, but I am going to be truthful, and sometimes that is better than being complimentary. I think it is a wonderful thing that has been accomplished in a short generation or two in the matter of the development of electric railways. I will confess my ignorance—I do not know when the first electric railway was built and operated, and I was trying to think, on the train last night, of some sort of a milestone by which I could fix the time, but I was unable to do it. But I do remember a certain railway milestone, and that milestone was planted a little way East from here in an Ohio village, something less than one hundred years ago.

When the group of people who were interested in getting a railway through that certain county asked the Board of Education to permit them to hold a meeting in the schoolhouse, in order that they might discuss ways and means for bringing the railroad to their community, the answer that came from the President of the Board of Education was something like this: "The schoolhouses are always open for matters of education, but we have no intention of promoting the devilish schemes of a set of people who want to bring terrible machines into our midst which will travel at the terrific rate of speed of 15 m.p.h."

Now, that is less than a century ago, and if I may make a parallel in the development of the thought of the world, particularly in reference to women, I want to say that about the same time, down in the little sister state of Connecticut, they had a law on the statute book taken from the law of old England that a man might beat his wife whenever he wanted to, as often and as hard as he pleased, provided only that he used a stick no thicker than his thumb. When there was a resolution introduced to abolish that law, a minister, if you please, by the name of Tanner, got up in the Assembly and said "that if an American husband residing in the State of Connecticut were not permitted to beat his wife with a stick no larger than his thumb, the foundations of society would be undermined."

Now, I have been listening all my life, until within the last few years, to men's views on how women, by their actions, in seeking to extend their personal liberties, and in securing political recognition, were going to undermine society.

When I used to make suffrage

*Abstract of an address delivered at the Midyear Dinner of the American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

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speeches all over the place I was invariably confronted with the argument from a number of men that if suffrage was extended to women, society would be undermined. And again, in this connection, we may go back, if you please, to England, not so many generations ago, when the plain people were asking that they might have a representation in the Parliament, and the powers that be, the kings, the dukes, the earls, the barons and all the rest of them, set up the cry that if the plain man—by that meaning really the farmer—was permitted representation in Parliament, the crops would rot in the field.

It is only a few years ago—not more than ten years ago—that I heard men say in open debate that if women voted, if they were permitted to go to those dangerous and fascinating places called the polls, they would not sew on any buttons, they would not cook any dinners, and they would not take care of the babies, because they would be so active in connection with outside matters that all their time would be taken up in that way.

I went back to Illinois from Washington and voted when the women cast their first vote for Mayor of Chicago. Upon leaving the door of my home, I took my watch in hand, and went around the corner to the voting place in a barber shop, which was arranged with a voting machine, and there were nice flowers in the shop, with a mirror in it, and everything was very pleasantly arranged, and there was a place next door where the women could leave their babies. Those were the circumstances under which I cast my first vote. I thought that it would be necessary for me to spend the entire day in doing it, but as a matter of fact, I got back to my home in seventeen minutes, having discharged my duty as a citizen in voting.

Women Are Interested in Local Institutions

Now, these things are here, whether people like it or not, whether they prefer the good old days when women had nothing to say makes no difference. The problem must be faced. I could talk a long time about women in politics, but I want to say this: Women in politics in my judgment (and I base my judgment on what they have done politically in the time they have had the vote, I do not mean since the National Amendment was passed, because you know some of the women have had the vote almost during the entire period of my life, that is, in some portion of this country), women in politics, I believe, are actually conservative. I believe women have a great respect for institutions, not only for political institutions, but for social institutions—I know they are very radical and wherever there is, as Roosevelt used to call it, any human necessity, in connection with women and children, or the welfare of the home—mark that particularly, the welfare of the home—women will take a great interest.

Women are not going to run into politics in the sense that they are going to try to hold all the offices. You would be surprised how hard it is in the states where they want women to run for offices to find one who is willing to do it, but women are particularly keen, politically, about the things that they can see and understand, and any of these women who are here—and I see some of them I have known a long time in the work for women—will tell you that what we used to talk about most was not that we were going to see that such and such a treaty was passed. No, indeed, we are very modest. We said, Of course, men will know more about treaty making and about the canals and men will have a better understanding about reciprocity, but it is local self-government we are concerned in first, the things that lie at our doors.

The Women Are the Great Sentiment Makers

I can remember when I have spoken on the question of having to hang, not by my hands, but by the tips of the fingers, onto a strap in an electric railway car, and of other similar experiences in the ordinary routine of daily life. We have talked about all those things and all the rest. That is our material. Those are the things we won our suffrage on—the street railways, telephones, electricity, pavements, and all of the features relative to the rest of the utilities, that was our best amunition. I think that women have come into a broader understanding of all these things and that is the point where women become very important to you.

You have heard Mr. Insull and other speakers here this evening refer to the value of harmonious public relations between the utilities and the public. Do you know that the women are the great sentiment makers of the world? I have found that out; I found it out during the war; I guessed it before, but came to an absolute conclusion during the war that such was the case.

I want to refer to an organization you know well, but I want to tell you a little of it in detail, and that was the great Women's Liberty Loan Organization, which extended its activities all over this country. I remember the day when I was first shown into the office of the Secretary of the Treasury. It was during the First Loan and he asked me if I thought the women could organize sufficient sentiment among the women of the country to get them to sell the bonds, and this to include not only the women who were to sell the bonds, but the women who were to purchase some of them, and I answered, "Yes, but I want to say to you, Mr. Secretary, that there is one great way to organize sentiment or organize anything else, and that is to give the people responsibility. Now, why don't you couple with this organization a sentiment for the sale of bonds to and through the women of this country?"

The Secretary of the Treasury then asked me how large a volume of bonds I thought the women's organizations in the country could dispose of. I was afraid that he would consider me crazy if I told him the figure which I actually had in mind, but I summoned up courage and said that I believed the women of this country could sell half a billion dollars worth of bonds. When we finally closed the books, we found that we had sold five billion, five hundred million and ninety thousand dollars in bonds.

"A Bond in Every Home"

You may well be pleased at that, because these bonds were sold principally to women, and these purchases absorbed mainly the fifty dollar and one hundred dollar issues. You do not know what women can do in various lines of endeavor. You do not realize the sacrifices that they can make, and this is of interest to you gentlemen who are assembled here, because if this millennium which you have held before you, when the public is with you, is to come at all, it will not come until some such slogan as this has been adopted by all of your companies—"A bond in every home," and you will never get a bond in every home except through women.

I do not suppose you realize, perhaps—I did not until some time ago when I had occasion to look it up for the State of Illinois—how much money the women of this country represent. At one time they owned one-fifth of all the wealth in the great state of Illinois. In some states they have a great deal more wealth and their earning capacity is simply enormous. I tried to get some figures on that, but I regret to say that the census figures were not completed before the time I left, and I was not able to get the figures I desired.

Women Make Good Bond Buyers Because They Are Naturally Savers

I want to say that this enormous amount we realized on bonds was through sales to women, in very great measure, not entirely, of course, but in very great measure. Women are natural savers, even though they may be earning small amounts, because women who earn money very seldom earn a very great deal of money. Take a woman earning $1,400 a year and put her alongside of a man who is earning $1,800 a year, or $2,000 a year, she will have more money saved at the end of a year than he will have and the examples that came to us were wonderful.

The good people who run the utilities would find a wonderful market for their bonds among the women of the country. Women have been shown the mirage of rubber plantations in Mexico, every kind of blue sky operator has done them up, and women would be glad of opportunities to make safe investments.

Again, it would be a question of local self-government—you could have no better guarantee, no better backers, no better group of people behind you

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than a good representative number of the women in any community as holders of your investments. Mr. Insull referred to a company in Minnesota which had adopted the plan of selling its securities to the people living in the communities which that company serves with gas and electricity, and referred to the very great success of the company in that respect. I say, again, that a public utility can do no better than to have a group of intelligent and interested women as holders of its securities.

Then, there is one thing which you must remember, above all, and that is that the women have the vote—do not forget the vote—that is a very great thing.

And now, in closing, I want to say one more word to you and that is that women, for the first time in their lives, are understanding the meaning of taxation; for the first time in our lives we women are really getting a comprehensive view of what it means to pay taxes. Women now know what taxes are. This is your golden moment to educate the public through your women. Remember that they are the leisure class, too. They are the people who have the most time to think and talk about these things, because after all, the great majority of women are in the homes. You must teach them while you are trying to sell them what you have to sell—you can teach them what taxation is, you can teach them that if the taxes are too high on your properties the fare must of necessity be higher than if the taxes were lower.

Remember that the public utilities are something that belong to the home. If you need an example of how women feel about that sort of thing turn to Des Moines. I read in the newspapers that, after the street railways had been closed down and they were running the jitneys, it was a group of women who insisted that the street railways be operated because they insisted that the jitneys were unsafe for their children to ride to school in.

I have given you a disjointed talk on women in relation to your own special interest, but remember, when you are dealing with women in public, they are exactly like the women at home, whether they be your wife, or mother, or daughter, or whoever the woman may be. Forget that you are specialists, and forget your great technical learning, and treat the women as plain, ordinary, friendly, everyday human beings.

Public Relations—
The Most Important Asset a Utility Can Have*

By Samuel Insull

President the Commonwealth Edison Company, Chicago, Ill.

Extending a Proper Conception of the Economics of the Public Utility Business Is a Prime Consideration in Securing Public Good Will—Methods of Accomplishing This Are Outlined and Illustrated

I AM inclined to think that if I had to choose between having ample capital, fair rates and absence of all incidents interfering with income such as jitneys and buses, on the one hand, and the question of friendly public relations on the other, I would, based on my experience in public utility business, accept the latter alternative. It matters not how much capital you may have, how fair the rates may be, how favorable may be the conditions of service, if you have not behind you a sympathetic public opinion you are bound to fail.

And I am inclined to think that more or less of the troubles that have afflicted some, not all, of the utilities during the period of the World War and the period of inflation following the armistice can be traced more to a lack of proper public relations—to a lack of public sympathy—than to any other cause.

I think that you and I and the people engaged in the public utility business are largely responsible for that situation. I am not one of those who believe that the public utility business has perceived the light and been redeemed.

As I stated at a luncheon given by the Mid-Day Club in Springfield, Ill., a few weeks ago, I am a man proud of my business, proud of my relations with it, and if it were possible for me to start my life over again and start with the experience I have today I would go into the public utility business. I know of no field of endeavor that offers the opportunities, not so much of personal emolument, but the opportunity to add to the wealth of this great commonwealth. I know of no group of businesses that have to a greater extent made two blades of grass grow where one heretofore grew; that have added more to the material wealth of the state; whose businesses have made possible greater economies in the manufacture of the articles that we wish to ourselves and the peoples of the world than have the various branches of the public utility business.

Our trouble lies mainly in the fact that for a great many years we lacked understanding of the economics of our business ourselves and that at this time a knowledge of the true economics of the various public utilities is confined to a few of the people engaged in those businesses. What we need worse than anything else is to sell our business to our own officials and employees and then sell it to the public.

You can't expect to get proper treatment from utility commissions, you can't expect to get proper treatment for your customers, when the fact is there are so few of the people who work for us, to say nothing of the people themselves, who have the slightest conception of the economics governing the business that we are engaged in.

Now involved in this question of public relations is, first, our relations with our employees. How many employees of an electric light company or gas company or street railway company understand anything about the elements making up the cost of production, elements that should govern the establishment of proper rates.

Take the business that you people are more particularly interested in—street and interurban railway business. How many of your employees know the effect on cost of service of all of the various obligations that you are subject to under your ordinances? What effort have you ever made, and I might say the same thing of an electric light company or gas or water company, what real effort have you ever made to establish a thorough knowledge of these conditions in the minds of your own people? And before you go out afield to capture the public the first thing to do is to capture your own people who work for you and expect to stay by you, year by year. Then when you have done that, when we have all done that, I think our next job is to give the public a better understanding of our situation. They have had to learn something about it during the period of the war, but there is a vast range of subjects that they should consider.

Why should it be considered fair compensation in a city like Chicago to carry people 30-odd miles, I think it is, for 5 cents just as it was considered ten, fifteen or twenty years ago fair compensation to carry them 1½ to 2½ or 3 miles for 5 cents? Why should the user of your service be subject to the double taxation, as he is subject to double taxation, when included in your fare is the repair of part of the streets,

*An address delivered at the Midyear Dinner of the American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

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the carrying of policemen, the carrying of mailmen and the carrying of everybody else who can present a star, without compensation?

Why should those conditions be allowed to exist? How much does the public know of such subjects of that kind—just a simple little proposition.

Now, how are we to reach the public? First of all, having reached our own people and having created an army of experts who can go out and spread the gospel for us, what is the best way of reaching the people? How many street railway companies advertise that they have something to sell? Yet they are in the business of selling local transportation. The vast majority of them assume that everybody has to use their service. Their advertising is of a most limited character and yet they have service to sell; they have transportation to sell just as much as the transcontinental lines have transportation to sell. I can well remember the time when it was looked upon as rather ridiculous for the local electric light company to advertise the sale of electric energy; it covered the territory and had a monopoly on the business, so why waste any money on advertising. I remember that subject being very seriously discussed in various electrical technical journals. It would be looked upon as absurd today. Why should not the local street railway company be just as much interested in creating an atmosphere of friendliness and friendship and desire to use its service as the local dry goods store and the local department store are anxious by spreading wares either in the window or in the public press to tempt customers to the stores? Why should not the same method be universally followed in selling local transportation? Why are not the advertising columns of newspapers used to a far greater extent than they are in conveying correct economic information with relation to our various public utilities? People get their information mainly from newspapers. Prejudice created against us is created very largely in newspapers, and I think that it is a fair item of cost—the advertising of the advantages of the product that we have to sell and all the elements making up the cost of that product. It is a fair item of cost of service to add to the enlightenment of the public on those subjects by advertising.

Utilizing the Editor's Tendency to Form Habits

Now, then, take another phase of reaching the newspapers with the idea of creating proper public relations and sentiment. What the editor publishes is very largely a matter of habit. One time he talks a good deal about the mercantile marine, another time about the steel business, another time about the coal business, and why not get him in the habit of talking about the public utility businesses that you have. There exists in a number of states a state committee on public utility information. We got the idea from some of our activities in Illinois during the war and started the Illinois Committee on Public Utility Information. We engaged the best experts we could find when we wanted something on financial topics; the best writers when we wanted something on some special topic, and we make a practice, week after week, to communicate with about eight hundred different local newspapers. The effect has been tremendous throughout the State. That same class of work is being done here in Indiana and in a great many other states. It is helpful in the creation of the proper kind of public sentiment. But you have to go with the right kind of information. It is no use just to present an argument; you want to present facts, and you have got to go with clean hands and you will get a hearing. You have all the machinery in connection with your association for getting that kind of information and it is simply a question of applying its use. To my mind it is the most important job that the manager, president or chairman of any public utility corporation can apply himself to. It is of more importance to him, as I said in my opening remarks, than all the rest of the things put together, because if you have not a proper public relationship, capital will disappear, rates will become onerous, conditions of service will become offensive and your customers will go by the board, I care not what may the protection of the courts or institutions. We have all of us a great mission in this respect. It is not only a duty we owe to our ownselves and our stockholders, but a duty that we owe to the community of citizens.

Mr. Insull hits the nail on the head, thus:

Our trouble lies mainly in the fact that for a great many years we lacked understanding of the economics of our business ourselves and that at this time a knowledge of the true economics of the various public utilities is confined to a few of the people engaged in those businesses. What we need worse than anything else is to sell our business to our own officials and employees and then sell it to the public.

And I will tell you another way of spreading the gospel. Take the people into partnership with you. Last evening at 5 o'clock I attended the annual meeting of the stockholders of the Commonwealth Edison Company. A few years ago it used to be difficult to get a sufficient number at the meeting to propose the different resolutions. We have 25,000 stockholders and we had 1,500 at the meeting yesterday afternoon. That of itself is a great protection to that particular property. It reminds me here of an incident of what occurred in connection with one of the Byllesby properties in Minnesota. Jones returned from the annual session of the Legislature and remarked to his next door neighbor and he said: "Bill, don't you think it is about time we went for this electric light company?"

"What electric light company?"

"Oh, this electric light company here."

"Oh, you mean *our* electric light company!"

And Jones said:

"What do you mean?"

"Oh, you have been away; you had better go around and you will find that you are the only man in town who is not a stockholder!"

I had an experience myself on the west side in Chicago. We sell Commonwealth Edison stock on the installment plan in small amounts to our customers. One of my canvassers was delivering a certificate of stock one evening and the subscriber said:

"This is my company, isn't it?"

"Well, as far as that stock is concerned—the proportion it bears to all the stock."

"Well, I can be a director?"

"Yes, if you can get enough votes."

"Well, then I am really interested in that property. Well," he said, "the fellow around on the other side of the block has been boasting of stealing current from you people for years and I'll be darned if he is going to steal it from me."

And on that tip we collected three years from that boasting thief.

An Illustration from Rochester

I was sitting in the office of Mr. Searles, manager of the Rochester Edison Company, a few years ago and asking him about this very subject—about the sale of securities to customers and the effect it had upon the general sentiment of the community, and the telephone bell rang. It was Monday morning and somebody called him up, Jones, we will say:

"You don't happen to know me, but I'm a stockholder. There has been a lot of cable and wires lying outside my house ever since Saturday and I'm afraid it will get lost. I wanted to know whether you had any work around here just now. Of course, if it is telephone cable I don't care about it; but if it is electric light cable I want you to clean it up."

That's the practical side of this thing. I told a meeting of bank clerks last week in Chicago that what we were engaged in doing was selling our property of the Commonwealth Edison Company to the community as individuals; that we did not believe in municipal ownership where it involved municipal operation because of the gross extravagance of every form of municipal operation, but we did believe in community ownership through our individual customers. And the more you can do of that kind of thing the more people will be interested in getting a proper idea of the principles governing our business and the easier will be your job to establish proper public relations.

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A Commissioner's Viewpoint on Some Electric Railway Problems*

By Hon. W. D. B. Ainey

Chairman Public Service Commission of Pennsylvania, Harrisburg, Pa.

Management Must Be Allowed to Perform Its Proper Function — The Pennsylvania Commission Is An Inquisitorial Agency with Corrective Functions—Statutes Have Never Answered Any Great Crisis—The Human Element Must Solve Our Utility Problems

UNDER our modern conception and as the result of the complexities of our civilization in these days, the utilities of the nation no longer relate themselves to the category of private enterprises. The comfort and happiness of the people is dependent upon them and their measure of operating efficiency is a measure of their reply to the nation's challenge for service.

The economic and business prosperity of a nation, and, in consequence, the well being of all our citizens, is largely dependent upon the sound and functioning conditions of the two great circulatory media, arteries through which flow the lifeblood of the country —finance and transportation.

This meeting of your association and the duties devolving upon the public utility regulatory bodies of the land naturally needs the emphasis of these remarks to be placed upon the latter.

To the clarity of our thinking, it is necessary therefore that we divest our minds of the underbrush of some specious reasoning. Let me therefore present for your consideration some suggestions applicable to the utility problems as a whole, in order that from the general we may pass to the specific.

Recognizing as we do, that utility service is necessary for the public's benefit, it follows that that benefit cannot continue except by the preservation of these utilities upon standards of efficiency and economy.

There must come a greater appreciation on the part of the public of the benefit which they derive from transportation and the necessity on their part of greater co-operation in securing it. On the part of utilities in general and transportation companies in particular there must be an ever-increasing emphasis made upon their public responsibility in the rendition of their services; and on the part of the regulatory bodies of the state and nation there must be a clearer understanding of their duties and relationship both to the public to be served and to those companies which render the service.

A sympathetic rather than an antagonistic approach must be made by all these factors in order that each may understand the difficulties and the necessities which confront the other.

*An address delivered at the Midyear Dinner, American Electric Railway Association, Indianapolis, Ind., Feb. 28, 1922.

HON. W. D. B. AINEY

In final analysis and speaking broadly it is in the management and in the management alone that there is to be found the solution of the utility problems of the country. Upon the shoulders of management have always rested and will continue to rest the responsibility for the success of any enterprise, whether that enterprise be public or private. When management is dethroned, is unduly hampered or fails, the business ends, and to the extent that the public are interested in that business, the public suffers.

In so far as public utilities are concerned it should be the policy of the law not to permit that managerial responsibility be avoided. Responsibility, however, without authority to make itself effective, is vain.

Responsibility is but another term by which to define the "right, or reciprocal duty, of initiative." But if this opportunity to exercise initiative is destroyed then responsibility is but an empty name and management fails. A handmaid of initiative is "incentive" and a major difficulty in the regulatory program of our laws is a failure to provide for or to recognize and thus spur on that incentive to greater effort on the part of our utilities.

There is a provision in the public service company law of Pennsylvania which is a source of considerable gratification to me. It is one wherein due allowance can be made by the commission for efficiencies and economies in operation, and thereby furnish an opportunity for management to secure that extra reward which comes from good, as distinguished from poor, operation. A modern tendency which has caused me some anxiety and to which both the public and the utilities themselves have contributed is to substitute statutory standards for managerial judgment until today as a nation we are suffering, to the public detriment, from too much law and too much substitutionary judgment under the guise of regulatory policies.

The Appellate Courts of Pennsylvania have defined the Public Service Commission to be a corrective body with inquisitorial powers. It is a source of much gratification to me that this enunciation, which was buttressed by sound economic thought, has been made and it places the utilities and the commission of our state in that relationship which under our law should enable the utilities properly to function in public service, and subjects them only to the proper limitations that their rights of initiative shall be exercised and bounded by just and reasonable rates, service and practices.

Whenever either the public feels that it has been aggrieved or our utility companies are of the opinion that they have been hampered, with equal celerity they are inclined to rush to the legislatures of the states or to the congress of the nation for statutory relief, until we are rapidly becoming a nation burdened with a complexity of statutory enactments calculated to control the most intimate relations of life, in the doing of which we are continuously centralizing authority in Washington until it is evident that local matters to a large extent are lost sight of in the broad train of a nationalistic concept.

I have used the term "management" advisedly as a factor as distinct from capital as it is from labor. Of course capital selects management as management in turn selects labor. Management is responsible for the continued support of each and cannot succeed without the support of both. Management's duty is to preserve the property for the benefit of and to secure if possible a fair return to capital; to give to the public adequate service at reasonable rates and to labor an adequate wage and proper working conditions. Management has the further burden of providing incentive for capital as it has the duty of securing incentive to labor, and it likewise is called upon to secure a fair measure of public sympathy and support by prac-

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tices calculated to inspire the public's confidence. I quite agree with you that these are more easily stated than they can be effectuated, but I venture this conclusion with some assurance that the answers are to be found not primarily in statutes but in sympathetic public contact.

Probably no class of utilities has had its revenues depleted and its operating expenses increased to the extent that the electric railways have. There are several contributing causes. One of these is the advent in increasing numbers of the privately owned automobiles. In Pennsylvania ten years ago there were approximately 10,000 such vehicles, while today there are nearly 700,000. In so far as these vehicles are concerned the situation will no doubt continue and perhaps be accentuated. Some years ago the sole answer to the electric railway difficulty which your companies suggested was the increase in the rates of fare. Several years ago I suggested in two addresses, one in St. Louis before the National Chamber of Commerce, and the other in New York at a meeting of your association, that you could not well afford to neglect the merchandising side and opportunity of your business and coined a word at that time to designate my thought. It is a source of some gratification to find that your principal electric railway journals in recent issues have emphasized this same idea and many of your companies are putting in practice effective programs by which the car riding habit can be and is being increased.

And this is your opportunity. From the broad standpoint of national interest and patriotic expression your companies have, during the period of time when the world was in a whirl of international strife, established themselves in the minds of the people as integral elements in our national existence. During this period of your anxiety and distress, I had greater confidence in the brains and ability back of your organization than apparently you had in yourselves. You are emerging from many of these troubles, you have demonstrated the necessity for your existence, and where necessity exists, a method by which your continuance will be assured awaits but the master mind of those of your number who have devoted their lives to the railway problems. There are some truths new and others as old and unchangeable as the fixed stars in the heaven. The ability of the world to stand the stress and strain of any great emergency has been that the human element came to the forefront. That was true in the early dawn of history and it is true today.

In the rush and rumble of the world's activity, we are apt to forget, and sometimes think that all things old have passed away in the dawn of a newer day.

Old Neptune lifting his head above the briny depths of the Atlantic a few months ago might have observed a strange monster of the air journeying from one continent to another, disputing as it were, his sway. But had he stopped for a moment to consider, he would have remembered that a few hundred years before, Columbus, traveling in the opposite direction, journeying from one continent to another, was guided on his voyage of discovery by the same old instrument which charted the course of the aeroplane—the compass.

Bedrocked in our national concept there are the compasses of eternal verity, man's responsibility to man, our duty toward each other, and our national ideal to the preservation of which we owe the highest degree of allegiance. Projecting the past into the future I have no other thought except one of extreme optimism, better voiced by one whose words touched the deep-toned notes of our nature when he said in the dark days of former times, "We have journeyed in safety through the wilderness and crossed in triumph the Red Sea of civil strife and the foot of Him that led hath not faltered nor the light of His countenance been turned away."

Exhibit of Safety Committee

W. H. BOYCE, chairman of the committee on safety of the Transportation & Traffic Association, had a very extensive exhibit for that committee in one of the rooms of the Claypool Hotel. This is one step in the announced policy of the committee to make safety work a prominent feature of the association program this year.

The exhibit consisted of more than 2,000 individual posters, car cards, newspaper advertisements, employees' magazines, company pamphlets and leaflets for distribution in cars, street signs, shop signs, bulletin boards, photographs, etc., all relating to the subject of safety. These exhibits for the most part were mounted on beaver board and arranged so as to cover all four walls of the room in which the exhibit was held. They represented all forms and styles of safety warnings, from enameled street signs to home-made signs. These latter were made a special feature of the exhibit, the theory being to prove clearly to even the smallest company that there is no reason why it cannot conduct a safety campaign.

Altogether twenty-five railway companies were represented in the exhibit, this being the number forwarding exhibits in reply to some 300 requests sent out by Mr. Boyce.

In addition to the exhibits of posters by railways, the National Safety Council, the Elliott Service Company of Buffalo and New York and the Railway Service Safety Company of Newark, N. J., contributed samples of safety posters and cards issued by them. The accompanying illustrations are two of the panels shown. The one showing the twelve black and white car cards was exhibited by the Railway Safety Service Company. The other panel includes three posters of the Community Traction Company of Toledo.

PANELS FROM EXHIBIT OF SAFETY COMMITTEE

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Second Joint Convention of Illinois Public Utility Associations

IN THE Feb. 28 issue of this paper, page 288, appeared the preliminary program of the 1922 joint convention of Illinois Electric Railways Association, the Illinois Gas Association and the Illinois State Electric Association. The convention will be held at the Hotel Sherman, Chicago, March 15 and 16. The mornings will be given over to general sessions. Wednesday and Thursday afternoon the several associations will meet in respective section conferences. The banquet will be held Wednesday evening. The final program is substantially as given earlier, but with a few modifications mentioned below.

John F. Gilchrist, vice-president Commonwealth Edison Company, Chicago, will speak at the Wednesday general session on "Co-operation with Illinois Committee on Public Utility Information." This topic will be discussed by W. H. Sawyer, Britton I. Budd, J. R. Blackhall, B. J. Mullaney and others.

The Thursday general session will be opened by Robert I. Todd, with an address on "What the National Associations are Doing," with particular reference to the American Electric Railway Association. The National Electric Light Association will be represented by President M. R. Bump, chief engineer of the Doherty Operating Organization, and the American Gas Association by Vice-President R. B. Brown. William L. Goodwin, assistant to the president Society for Electrical Development, will speak on "Some of Our Problems and How to Overcome Them."

As previously announced in more detail, the electric railway section will discuss traffic relations between steam and electric railways, advertising electric railway service, the modern electric railway franchise, recent developments in safety car design, wood preservation and bus lines as aids to electric railways.

C. E. R. A. Will Take Six-Day Cruise

THE executive committee of the Central Electric Railway Association met with the hotel and arrangements committee in Indianapolis on Feb. 28 and approved the plans proposed by the latter for having the summer convention on board the S.S. South American in connection with a six-day cruise on the Great Lakes. The cruise will start from Chicago on Sunday, June 25, following the route indicated by stops at Mackinac, Detroit, Toledo, Cleveland, Charlevoix, Traverse City, Ottawa Beach, Benton Harbor and thence to Chicago, arriving there Friday afternoon, June 30. With these various stops it will be possible for the members to pick up the party at a point to suit their convenience, time available and pocketbook. The entire cost for the full trip, which will be taken by a large majority, judging by last year's cruise, will be $70. This is $5 and war tax less than the cost last year. The cost of any part of the trip is proportional. The detail schedule and rates will be published later. The committee urges that members lay their plans and make reservations early with John Benham, 15 South Throop Street, Chicago.

Railway Engineers to Meet in Chicago

AS USUAL, the American Railway Engineering Association will hold its annual convention in Chicago. This will be the twenty-third annual convention, and the meetings will be held in the Congress Hotel March 14 to 16.

Tuesday March 14, will be occupied with the president's address, the reports of the secretary and the treasurer and the reports of the committees on yards and terminals, electricity, ballast, iron and steel structures, standardization, signals and interlocking, ties and track. On Wednesday, March 15, the reports to be presented include shop and locomotive terminals, roadway, economics of railway location, stresses in railroad track, records and accounts, signs, fences and crossings, water service and uniform general contract forms. The annual dinner will be on Wednesday evening. On Thursday the reports will include masonry, rail, economics of railway labor, wooden bridges and trestles, economics of railway operation, buildings, wood preservation and rules and organization. On Thursday there will be a memorial meeting for John F. Wallace and a closing business session. An excursion to the Gary industrial district will be made on Friday after the close of the convention.

Southwestern Electrical & Gas Association

THE eighteenth annual meeting of the Southwestern Electrical & Gas Association will be held in San Antonio, Tex., May 3 to 6.

The convention will be participated in, also, by the Southwestern Geographic Division of the National Electric Light Association, and delegates and guests will be present from Texas, Oklahoma, Arkansas and Mississippi.

Annual Meeting of Oklahoma Association

THE Oklahoma Utilities Association will hold its annual meeting on March 14 to 16 at the Lee Huckins Hotel, Oklahoma City. General meetings will be held mornings and section meetings afternoons. Among the subjects arranged for consideration at the general sessions are the Kansas industrial law, which will be discussed by R. W. Huggins, presiding judge of the Court of Industrial Relations, Topeka, Kan.; taxation, accident prevention, publicity and a banquet talk on Wednesday night on "What Has Experience in State Regulations Taught Us?" by Noah W. Simpson, member Missouri Public Service Commission.

Of the subjects of interest to electric railway men to be discussed at the section meetings are the following: Analysis of corporation commission order pertaining to telephone and power line crossings; concerted action and how shall it be taken in relieving street railways of paving burdens; effect of the safety car and modern methods of fare collection on accident prevention; the jitney problem; should electric interurban lines be extended in Oklahoma? the use of electric track switches; possibility of returning to 5-cent fare, and how to inform the public on schedule and routing changes. The meeting of the electric railway section will be held on Wednesday afternoon, March 15.

On Thursday morning a joint session of all sections will be devoted to the discussion of the subject of appraisal and valuation work.

American Engineering Council

THE executive board of the American Engineering Council will meet in Chicago on March 10, at the headquarters of the Western Society of Engineers, Monadnock Block.

Mayor Addresses Camden Section

MAYOR THOMAS W. JACK of Collingswood, N. J., was the speaker at the meeting of Company Section No. 13, held at Camden, N. J., on Feb. 16. In his talk, the Mayor, after recalling some of the early history of street cars in Collingswood, compared the duties of a railway man with those of a salesman, such as he had been for a number of years. He told the men that somewhat more than courtesy is essential in their work and complimented them on the improvement they have made in this line during the last few years.

American Engineering Standards Committee Elects Officers

AT THE adjourned annual meeting of the American Engineering Standards Committee, recently held in New York City, Albert W. Whitney, a representative of the National Safety Council, was elected chairman, and George C. Stone, a representative of the American Institute of Mining & Metallurgical Engineers, was re-elected vice-chairman. Among the eighteen members of the executive committee elected to represent the respective member bodies of the committee are the following: Martin Schreiber, American Electric Railway Association; C. E. Skinner, American Institute of Electrical Engineers; E. A. Frink, American Railway Association (Engineering Division); Eugene C. Peck, American Society of Mechanical Engineers, and John A. Capp, American Society for Testing Materials.

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Recent Happenings in Great Britain

Wage Deflation Continued—New Financing Successful—Growing Government Debt a Menace

(From Our British News Representative)

IN THE middle of January the National Joint Council for the tramway industry notified the tramway undertakings of the country that in view of the fall in the cost of living index figure for December to 92 per cent above the pre-war cost, reductions in wages would be made as from the first full pay period in February as follows: Employees aged eighteen and over, 3s. per week (making a total reduction since August last of 8s.); employees under eighteen years of age, 1s. 6d. per week (making a total reduction since August last of 4s.). These reductions come about automatically under the sliding scale, by which wages rise or fall according as the index figure rises or falls. The London County Council announced in the end of January that this reduction of 3s. a week would mean a saving of £93,000 per annum in the working expenses of the tramway undertaking. Other places will benefit correspondingly. In the meantime, however, surpluses will not be commensurably improved.

One-Man Safety Car a Novelty

C. J. Spencer, manager of the suburban tramways associated with the London underground railways, was one of a deputation from the "combine" which visited the United States in 1920 and investigated traffic problems and methods of dealing with them there. Perhaps it is one of the results of the visit that he is now experimenting on the London United Tramways with a one-man safety car, which is a great novelty on this side. It is a single deck car and the driver's platform is fully vestibuled. The brake is a hydraulic track one of the type designed by Mr. Spencer when he was with the Bradford Tramways. There is the usual "dead man's handle." The door for passengers is at the front end, and door and step are operated simultaneously by the motorman. The car cannot be started till the door is shut and the step folded. As the car has been approved by the Ministry of Transport and licensed by the Commissioner of Metropolitan Police, there will be no legal obstacle to multiplying the number of such cars should the experiment prove successful.

Holding Company Carries Out New Financing

It is not often nowadays that a tramway company issues new capital, but it was done during January by the Fife Tramway, Light & Power Company. As its name implies, however, the company is not wholly dependent on tramways. It is a holding company, and owns the shares of the Fife Electric Power Company, the Dumfermline & District Tramways Company, the Scottish General Omnibus Company, and the Falkirk & District Tramways. Until this new issue the paid-up capital of the holding company was £720,000, along with £236,000 of debenture stock. Good dividends are paid on the ordinary shares, the rate for 1919 and 1920 being 8 per cent. The new issue consisted of £250,000 of 7 per cent debenture stock at £93 per £100 share. Proceeds are to be devoted to developing the company's property. The new stock will be redeemed by a cumulative sinking fund. So keen were the public to secure the stock that the issue was oversubscribed eleven o'clock on the day offered.

Good Results Despite Hard Times

In spite of hard times the Lanarkshire Tramways Company continues to show good results. The revenue for the year ended Dec. 31 last amounted to £227,450, and the expenses to £188,510. After making various deductions, the directors are able to declare a dividend at the rate of 6½ per cent per annum for the second half of the year, making with the interim dividend for the first half 5¾ per cent for the year on the issued share capital.

From annual statistics prepared by W. Allison Davies, borough treasurer, Preston, Lancashire, it appears that for the financial year 1921-22 municipal tramway undertakings in thirty-eight towns in England had to receive aid from the rates, while in nine towns contributions were made by the tramways in relief of local taxation. The amount of the subsidy from the rates varied from £80,707 in the case of West Ham down to £325 in the case of Ossatt. The payments made out of tramway profits in aid of the rates ranged from £18,000 in the case of Wallasay down to £233 in that of Nelson. These results are no great testimony to the financial success of municipal tramway enterprise, but of course the year was probably the worst in tramway annals.

Five tramway companies operating lines in the "black country" district of the Midlands are jointly promoting a bill in the present session of Parliament in regard to powers of purchase by local authorities. The system of tramways which these companies work is situated within the areas of a large number of local authorities, who are authorized to purchase compulsorily parts of the undertakings at various dates between 1922 and 1938. The bill proposes to postpone the first date of possible purchase till 1951.

I recently referred to the fact that the London County Council had decided to institute a system of rewards for useful suggestions or devices by employees for facilitating traffic or work. In this step the Council is following the example of the London underground railways which have a successful scheme of the kind in operation. During the year 1921 these railway companies received 4,149 suggestions. Awards were made in 234 cases.

Expansion of State Debt a Growing Menace

A committee on national expenditure—of which Sir Eric Geddes is chairman—on Feb. 10 issued two voluminous reports recommending reductions of expenditure on various State departments. One of the proposals is the abolition of the Ministry of Transport. The committee is composed of business men, and their instruction was to make recommendations to the Chancellor of the Exchequer for effecting forthwith all possible reductions in the national expenditure. Sir Eric Geddes was Minister of Transport until recently, and he withdrew from the deliberations of the committee so far as the Ministry was concerned. The proposal of the committee is that the functions of the Ministry of Transport should be transferred to the Board of Trade. It was from the Board that some of the functions of the ministry were transferred when the latter was constituted by the Ministry of Transport Act, 1919. The committee says that its proposal is in agreement with an opinion expressed by Sir Eric Geddes to the Prime Minister that with the passing into law of the Railways Act, 1921, a separate ministry would be unnecessary.

The ministry was empowered by the Act of 1919 to carry out many new duties as well as those previously performed by the Board of Trade and other departments. In general it was to improve the means of the facilities for locomotion and transport. It was to co-ordinate and develop existing means and to arrange for the development of new means. The Act was passed at the time of the temporary boom after the war, when magnified ideas were held about the possibility of improving everything almost out of recognition, and the talk was about "making a land fit for heroes to live in." With the general slump came disillusionment, and it was found that, however desirable many things might be, there was no money to pay for them. The ministry consequently was unable to carry out many objects which it was designed to accomplish, but it has done a lot useful work. Its most important achievement was the Railways Act for consolidating and regulating the railways of the country. The control of tramways, so far as they are controlled, is under the ministry, and it secured the passage of one or two emergency Acts of Parliament for their benefit whether the government adopts and carries out the proposal of the committee regarding the Ministry of Transport remains to be seen.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Saginaw Wants Railway Service

Twenty-five-Year Franchise Being Prepared—Proposed Agreement Includes Bus Line Feeders

Another attempt is to be made to have the Saginaw-Bay City Railway, Saginaw, Mich., resume railway service in Saginaw. Plans are now being formulated and a definite announcement is expected soon as to the attitude of the bondholders and other creditors of the bankrupt property through the protective committee.

Otto Schupp, who was named receiver for the company when an involuntary petition in bankruptcy was filed, has been appealed to by a committee of local business men and manufacturers to start the cars under a twenty-five-year franchise which is now being prepared. The details will be worked out within the next day or two and the contract will be submitted to the committee in New York by the receiver.

Under the terms of the proposed agreement present lines are to be maintained and there are to be a number of bus line feeders. The rate of fare for the first two years is to be five tickets for 25 cents and transfers are to be provided from bus to car and car to bus. After the first two years the question of the rate of fare and service, in case the company is unable to agree with the city on its demands, is to be submitted to the State Public Utilities Commission.

Citizens Demand Relief

Citizens headed by J. B. Kirby who demanded of the receiver that service be resumed laid down the plan which the committee believed would be favorable to the city. The term of the grant is for twenty-five years, although it is revocable at the end of fifteen years by a 60 per cent vote of the electors.

As soon as the announcement was made of the plan, the Saginaw United Club came out in opposition to it. This is an organization which came into being Dec. 10, following the advisory vote of Dec. 7, when the electors by a majority of 871 said they preferred buses to street cars. The members have been working along the line of organizing a motor coach company to be entirely owned by the people of Saginaw. Their plan was to have been presented several days ago, but when the committee's demands for a resumption of railway service were announced the United Club stopped and went on record against the franchise as proposed.

The entire city is wrought up over conditions and business men, who have been hard hit by the lack of transportation facilities since last August, have become desperate. They assert that business is on the ragged edge and several, interviewed on the subject, assert that unless some substantial transportation system is soon forthcoming business failures will result.

At the present time the fight is a three-cornered one. The United Club, the citizens' committee and the United Transit Company, the outgrowth of the Jitney Bus Association, are in the field. To those who are not identified with any of the movements it appears that unless there is some semblance of cooperation all will fail and the traveling public will be forced to depend upon the jitneys. The operators of the jitneys are frank to admit that these vehicles alone cannot solve the problems. Conditions within the organization are not the best, and because of internal troubles, the City Council has been forced to pass an emergency ordinance placing the entire control of the buses with the police department. At the present time 64 buses are operating and, owned by individuals, they are giving the police department trouble, but not to such an extent as when the owners were permitted to regulate themselves.

Attorney Wants Cincinnati Franchise Forfeited

Demand has been made of City Solicitor Saul Zielonka of Cincinnati that an ordinance be drafted immediately for passage by Cincinnati Council to forfeit the franchise of the Cincinnati Street Railway now held by the Cincinnati Traction Company. The petitioner that this action be taken is Attorney Robert S. Alcorn, who declares that failure or refusal of the City Solicitor to draft such ordinance and have it presented to Council will result in measures being taken immediately to initiate an ordinance and have it submitted to the voters.

Twenty-four counts are brought against the company, ranging from refusal to make extensions to accusing the company of falsely accounting for its gross revenue in order to procure the right to raise fares.

Mr. Alcorn is quoted as follows:

> I have a suit pending in Common Pleas Court which seeks to forfeit the franchise, and by agreement this is to be heard March 6. The traction company has answered through Attorney Alfred C. Cassatt, and Attorney Joseph Wilby filed an answer for the street railway company. I do not intend to wait for or depend upon this suit, however, but have demanded that an ordinance forfeiting the franchise be presented to Council, and if this is not done I intend to take advantage of the initiative and referendum law and will initiate such an ordinance myself.
>
> All I will need is a trifle more than 2,500 signatures of petitioners to initiate such an ordinance, and I am perfectly able and capable of securing these, and then we will put the matter up to the public and let it decide whether it wants to continue with the Cincinnati Traction Company as it now is conducting the street railway system here.

Wages Are Reduced in Massachusetts

As Much as Ten Cents an Hour Cut Off Pay in Voluminous Decision at Springfield

The board of arbitration in the dispute between the Springfield, Worcester Consolidated, Milford, Attleboro & Woonsocket and the interstate Consolidated Street Railways and the Attleboro Branch Railroad and Divisions 448 and 22 of the Amalgamated Association reached an agreement on Feb. 23 and made an award which became public on Feb. 28. This award in the case of the Springfield and Worcester lines continued the then existing maximum hourly rate of 68 cents in force up to March 1, 1922, and fixed a rate of 58 cents from that date until Jan. 1, 1923. Questions in arbitration covered the year 1922, the old agreements having expired Dec. 31 last. Operation of the lower rate was postponed until March 1 because the arbitrators decided that the men were entitled to this amount of lag because of the lag in their wages as the cost of living was rising.

Some fifty questions were covered by the decision, which was signed by James J. Storrow, neutral member of the board, and Bentley W. Warren, attorney for the companies, constituting majority of the arbitrators. James H. Vahey, attorney for the employees, filed a dissenting opinion, in which he expressed a belief that the cause of arbitration had been dealt a serious blow by the award.

The board reviewed the wage and living cost conditions during the period from June, 1912, to December, 1921, during which six wage increases of the men became effective. By means of a chart it was shown that up to June, 1920, the rise in wages lagged behind the rise in the cost of living during all the time except a few months in 1919, so that the first four wage increases were found to be unquestionably just. The board also finds that the reduction from ten to nine hours in the working day for motormen and conductors put into effect by the Legislature of 1913 was in line with the movement in other industries.

In June, 1920, the companies entered into agreements with the Amalgamated Association to grant three successive additional increases in pay, as follows: From 57 to 64 cents an hour June 1, 1920; to 65 cents Jan. 1, 1921; to 68 cents June 1, 1921. It was found that in the summer of 1920 the cost of living entered on a sharp decline, amounting to an equivalent of more than $1 a day in wages between that time and June 1, 1921, following which it remained at practically the same level for the rest of the year. Accordingly the arbitra-

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tion board decided that a material reduction of wages was just. On that score it says:

It is true indeed that if we possessed a wizard's wand we would rejoice to permit the employees to enjoy what, since June, 1920, owing to the drop in prices and the two subsequent increases in their wages, has amounted to a very large increase in their actual wages represented by the things they can buy compared with the things they could buy in June, 1920. But no one has handed us the wand and we must all realize that the double fare of 10 cents now charged in Worcester and the two-zone fare which requires the workman to pay 7 cents for the shortest ride in Springfield and 14 cents for many of them to get to their work represents an unqualified burden on men, a large majority of whom at the present time are suffering great hardship due to the present upset economic conditions.

It was shown by a table that the 68-cent wage was considerably in excess of wages paid elsewhere in New England, except on the Boston Elevated, where the rate has been reduced this year to 65 cents.

At the time of the award the 68-cent maximum rate was in force on all the companies involved in the proceedings, but in Springfield the method of payment was by the day instead of by the hour.

The more important findings are as follows:

Wages blue uniform men, Springfield and Worcester: Maximum hourly rate set at 68 cents from Jan. 1, 1922, to March 1, 1922, and at 58 cents from March 1, 1922, to Jan. 1, 1923.

Wages blue uniform men, Milford, Attleboro & Woonsocket: Maximum hourly rate set at 68 cents from Jan. 1, 1922, to March 1, 1922, and 53 cents an hour from March 1, 1922, to Jan. 1, 1923. Employes here get the benefit of the differential for operating one-man cars, in general use on that system.

Wages blue uniform men, Interstate Consolidated and Attleboro Branch Companies: Maximum hourly rate set at 68 cents from Jan. 1, 1922, to March 1, 1922, and 56 cents from March 1, 1922, to Jan. 1, 1923.

Minimum and intermediate blue uniform rates for all companies: Present differential of 10 cents less per hour than the maximum rate shall apply to the new men during the first three months of service, and 5 cents less per hour during the ensuing nine months.

Differential for operating one-man cars: Fixed at 8 cents, as against 13 cents previously and 5 cents asked by the companies.

Outside spread of hours in Springfield and Worcester: Spread for spare men in Springfield set at fourteen hours instead of eleven as formerly, and continued at fourteen hours in Worcester.

Daily guarantee for spare men: Seven-hour Worcester guarantee shall stand; Springfield guarantee to be the same instead of full day's pay as formerly.

Hourly or daily method of pay: Hourly basis shall be practice in Springfield as in Worcester.

Union's request for nine in eleven-hour day for all blue uniform men is denied, and hours of work for regular men on all the roads to be continued as under agreements then existing.

Extra pay for more than 13-hour spread to be continued in force.

Platform men on regular runs to get nine hours pay for day of eight hours or more.

Schedule run may consist partly of two-man car work and partly of one-man car work.

No rule to be set against a man performing his eight or nine hours of work without respite.

Request that working week be standardized at six days is denied.

Limited changes of runs to be permitted without putting up the whole schedule for rebidding.

Extra work by regular platform men before the start or after the completion of a run to be paid time and a half, except that compensation for this extra work shall not be less than one hour.

Intervening time between regular and extra run to be paid for at regular rate.

Deadheading to and from regular runs to be paid for at regular rate.

Blue uniform men failing to perform extra work scheduled owing to being late in ending regular run are not to be paid more than regular full day's pay.

Time allowed conductors for making up reports fixed at twenty minutes in Springfield and ten minutes in Worcester.

Employees to be paid 10 cents for making out each accident report.

Employees' right of appeal to the president of the company to be continued.

Pay of miscellaneous employees to be reduced 16 per cent, effective March 1, 1922.

Standard day set at eight hours for shop men, carhouse men, car cleaners, and line men, as previously.

Track men to work nine hours a day instead of eight, as previously, from April 1 to Oct. 1.

Seniority rules to continue practically unchanged.

Pay for all pitmen and pitmen's helpers set at 60 and 51 cents an hour, respectively, effective March 1, 1922, in place of varying and somewhat higher rates in Springfield and uniform rate in Worcester of 72½ cents for pitmen and 61½ cents for pitmen's helpers.

Regular linemen doing extra work between midnight and 5 a.m. to get day's pay as previously; time and a half for in case of work begun before midnight and finished after midnight.

Overtime pay and regular night pay not to apply to regular emergency crews or to regular or seasonal night shifts.

Vacation provisions to stand as previously.

Men transferred temporarily to work carrying a higher rate of pay are to receive the higher rate during the temporary transfer.

Bentley W. Warren, companies' arbitrator, while joining in the award, expressed "disappointment at the high rate of compensation fixed for blue uniform men, giving them, he said, an average rate for the calendar year 5.9 cents an hour higher than the average rate of such New England awards and 7.2 cents an hour higher than all such awards introduced in evidence. He also considered the one-man car differential of 8 cents as too high.

Attorney Vahey also protested the one-man car differential, and also the failure to make more marked the application of the nine-in-eleven hour provision. He complained of various changes involving pay reductions. He summed up in a declaration that "the great trouble about this award is that the patient (who is the employee) has been given so much medicine that he is very likely not to recover at all."

Martin J. Hennessey, business agent of the union, said: "We shall have to make the best of it and hope for better things next year." He added that it was the sentiment of the men not to sanction arbitration again on the question of the nine-in-eleven hour provision.

$19,850,000 Accepted for Detroit Properties

Directors and Stockholders of the Detroit United Railway Agree to Sell to the City on the Basis of Mayor Couzens' Proposal—The Matter of Purchase Now Goes Before Voters for Approval

Directors and stockholders of the Detroit (Mich.) United Railway voted on Feb. 28 to accept the city's offer of $19,850,000 for the city system, certain real estate not included. A special election is to be called by the City Council to vote on the purchase. A 60 per cent affirmative vote will be required. The initial payment is to be $2,770,000 with semi-annual installments of $500,000.

THE week previous the stockholders adjourned without coming to an agreement. Meanwhile the city's offer was increased to $19,850,000. It will be recalled that Feb. 21 was set by Mayor Couzens in his message to the stockholders at the annual meeting on Feb. 7 as the final date for acceptance of the purchase proposal. The week's delay sought by the company was not looked upon with favor by the Mayor.

After the meeting on Feb. 21, at which a further respite for a week was secured, it was said the stockholders and directors of the company were not all in accord, but it was announced that part were in favor of accepting the city's offer rather than have the Mayor enforce the ouster ordinance and proceed with the construction of municipal lines. This would amount to making the company junk part of its system. The franchise provisions which require the company to replace the paving if the tracks are torn up would force the company to spend a lot of money after the lines had been junked.

The company's representatives endeavored to bring about an agreement on a price approximating $22,000,000 and it was stated that that amount was needed by the company to offset its bonded debt and outstanding mortgages.

Under the city's offer as finally accepted there will probably be two questions submitted on the ballot at the next election. One proposal will be for authority to purchase the company's system and the other will be a bond issue to provide for the initial payment.

E. W. Moore, Cleveland, who was returned as a director by the minority stockholders, was active in the purchase negotations, toward the last.

The offer includes all the company's urban system not already taken over by the city, mentioned in the 1919 purchase plan, except certain land at Grand River and Mackinaw Avenues, and the paint shop in Highland Park.

The question of possession of the Woodward Avenue property was a sticker, since both parties desired it. The Detroit United Railway contended that it needed the property for use in connection with the operation of its interurban cars, while the city wanted it for storage facilities for its Woodward Avenue line and as a repair shop for the municipally operated system. The entire Woodward Avenue property includes paint shops, car shops and carhouse. The property at Grand River Avenue and Mackinaw it was conceded was more desirable to the company than to the city, since it would be of use for storage and repair facilities for the company's interurban cars using Grand River Avenue.

The company has prepared a list of the liabilities against the lines and other property which the city proposes to purchase, which amount to approximately $22,000,000.

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Governor Against Anti-Strike Bill

Governor Miller of New York has declared himself opposed to the anti-strike industrial bills introduced into the Legislature of New York. These bills would make it unlawful for an employer to declare a lockout or for an employee to go on a strike on account of a labor dispute. Governor Miller said:

I had no hand in the preparation or introduction of these bills. I have given such time to a study of them since they have been introduced as I have had at my disposal. I have no hesitation in saying that from the examination which I have now been able to give to them, I am of the belief, and the more I study them the more my conviction grows, that they go a great deal farther in the direction of establishing State-control over labor and industry than the people of this State are prepared to accept.

One of the fundamental objections to the bills, as the matter appears to me, is that they undertake to set up a judicial machinery to adjudicate on questions which I do not think are subjects of adjudication. For example, the question of wages. That is a matter of contract. It can't properly be made the matter of judicial determination according to any settled or known principles of law.

I doubt very much that the State can undertake, for example, to compel people to work for less wages than they are willing to work for and I do not think that a judicial tribunal can adjudicate the kind of questions which must necessarily be left to contract.

What the State can properly do, it seems to me, in the way of helping in the settlement of industrial disputes is along the line of endeavoring to secure fair dealing to prevent abuses, to, as far as it can, set up machinery for mediation and arbitration. And, I think, perhaps, the greatest thing it can do is to secure exact information of the facts involved in these disputes so that the public may know what the facts are.

Civility in Houghton

The "courtesy" idea has hit Houghton. The Houghton County Traction Company, Houghton, Mich., started a courtesy campaign on Feb. 15 assuring both patrons and employees that civility will tend to improve service. Trainmen are urged to be generous with smiles, "thank you" and "good morning" greetings. The patrons are asked to enter the campaign by giving their co-operation and helping to carry out the company's suggestions.

Outlook at Fresno Greatly Improved

F. W. Webster, manager of the Fresno (Cal.) Traction Company, is pleased with the outlook for the future for that company. The company is negotiating a new franchise with the city with every prospect of its early enactment and in addition the railway has begun to come back, showing a profit on operation for December.

Mr. Webster is quoted in the Fresno *Republican* in part as follows:

The franchise ordinance to be considered by the City Commission is a pioneer in its field and is based, with certain modifications and alterations, to meet Fresno conditions and objections on the franchises as granted in Montreal, Cleveland, Cincinnati, Memphis and Boston to rehabilitate and assist the street railways.

We are out of the red for the first time. December showed an excess of revenue over expenses, amounting to nearly 6 per cent, and January, I am assured, will duplicate the feat. February is also starting out on the same upward curve, showing that the condition is not spasmodic but promisingly permanent.

The broad minded spirit of the business men, city officials and the public generally while we were seeking a way out of the crisis facing us has been instrumental in getting a solution that virtually assures us of ready support in the financial market.

We have an investment here of, say, $2,000,000 and in the next five years may put in another $1,000,000. When the people want to they can buy back the property for what the system has cost, as ascertained by the Railroad Commission's adjudication, less depreciation.

Key Route Plan Would Cut Trans-Bay Ferry Time

The San Francisco-Oakland Terminal Railway has applied to the heads of the departments of War, Commerce and the Navy, at Washington, D. C., for permission to extend its East Bay terminus to Goat Island. This, it is stated, would shorten the water trip by 1½ miles and would reduce the time on the ferry from twenty to ten minutes. The company would be willing, it is stated, to build whatever type of bridge government authorities require and in addition to the rail lines would provide a roadway to make the Goat Island terminal accessible to vehicular traffic.

The present fill would be extended as far as practicable and the terminal on the island would be built on the north side, where there are shoal waters that could readily be reclaimed for terminal purposes. The application expresses a willingness either to finance the entire project or to join with other transportation companies in a joint terminal program. The plan is, in principle, the same as that suggested by Admiral J. L. Jayne, formerly stationed at San Francisco as commandant of the Twelfth Naval District.

Service Suspended by Glasgow District Subway

In consequence of losses incurred in working, the directors of the Glasgow District Subway Company announced early February that their railway will be closed until further notice. This subway, which was opened for traffic in the end of last century, forms a closed circle about 6 miles in circumference. The eastern part of the circle passes through the heart of Glasgow and the western part through Govan and Partick, while the other parts traverse the northern and southern districts of the city. The line passes twice under River Clyde.

Cable traction has been used all along, and with the exception of one or two short steep grade lines, and of the Edinburgh tramways (now being electrified) the undertaking is the only remaining example of cable traction in Great Britain. Since the Glasgow tramways were electrified the subway has suffered much from their competition, and the present period of trade depression has added to its troubles.

The Glasgow Town Council later took alarm at the prospect of the subway being closed because adoption of that course would inconvenience many people and would be likely to add to the congestion of tramway traffic during the busy morning and evening hours. A special meeting of the Town Council was accordingly held on Feb. 9, when after deliberation in private a resolution was adopted remitting to a special committee to adjust the terms of an arrangement for keeping the subway going for not more than two months. During that period the committee is to confer with the directors of the subway company and to report where, in the public interest, the Town Council should acquire the district subway undertaking.

Co-operation Seen Between Managements and Men

"Fares, Hootch, Craps and the Unemployed" is the title of an interesting eight-page pamphlet recently circulated among the employees of the Georgia Railway & Power Company, Atlanta, Ga., by means of a joint effort on the part of the local Amalgamated division and the company. The pamphlet contains a reprint of two articles which were taken from the *Union Leader*, an organ published in the interest of organized labor by the Amalgamated Association of Street and Electric Railway Employees of America. One is a card of warning published over the signatures of officers of division 241, the body which holds the 14,000 surface and elevated railway men of Chicago; the other is an editorial along similar lines. The text of the booklet shows the Twentieth Century attitude of the railway managements and the Amalgamated divisions in contrast to the old-time relationship.

Another instance of this co-operation idea existing between management and men is found in the boosting program which has become the order of the day in Alliance, Ohio. The local division of the Amalgamated Association here insists that there is nothing better than boosting. As a practical demonstration of its views this division started in January the publication of a monthly leaflet entitled *The Booster*. The aim will be to boost along the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railroad, the two companies employing members of this division.

Interchange Track for Public

The California Railroad Commission on Feb. 20 ordered the Central California Traction Company to permit cars of the San Francisco-Sacramento Railroad to be switched oven an interchange track owned by the former company in the city of Sacramento. The switching service has been performed by the Sacramento Northern which was notified by the Central California Traction Company to discontinue handling cars of the San Francisco-Sacramento Company over the track. The latter company appealed to the commission for a restraining order against excluding it from the use of this track. In granting the restraining order the commission held that the track in question had been dedicated to public use.

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Gas Case Appealed

Company at Atlanta Considers Questions of Law Involved to Be Vital Issues

The Georgia Railway & Power Company, Atlanta, Ga., maintaining that its rights under the Constitution of the United States had been violated by the Georgia Railroad Commission, which on Dec. 31, 1921 reduced the gas rate charged in Atlanta, has appealed its case to the Supreme Court of the United States, with the permission of the United States Circuit Court which recently upheld the decision of the State Railroad Commission.

In granting the appeal, Judge Sibley of the Circuit Court, orders the Georgia Railway & Power Company to post a bond of $100,000 until such time as the case may be decided by the Supreme Court. In the meantime the court grants a writ of supersedeas which will hold all gas rates at their present level. The court also orders that, if the case is decided against the power company, the power company shall at such time pay back all extra charges that have been collected.

RAILWAY LISTS ITS REASONS FOR APPEAL

The company bases its appeal on sixteen assignments of error, the more important of which are stated briefly as follows:

1. Because the valuation of the property of the company, as established by the commission, was $2,500,000 under the true valuation, and the lower valuation limits the company from earning a fair return on its property.
2. Because the court failed to find for itself a proper valuation.
3. Because the court, in fixing the value of the property, denied the right of the power company to assign a value to its franchise which is assessed and on which the company must pay ad valorem taxes, thus subjecting this particular part of the company's property without due process of law to the public use without permitting the company to earn any return thereon.
4. Because the court denied the company a sufficient working capital, and denied the right of the power company to amortize debts and losses amounting to more than $1,000,000 which the complainants were forced to sustain during the years 1917 to 1920.
5. Because of grossly incorrect rates fixed and enforced by the commission.
6. Because the court, in fixing a fair value of the company's property, refused to consider the element of original cost of financing which amounted to more than $500,000.
7. Because the court did not allow sufficient value for "going concern value."
8. Because the court held 2 per cent a fair depreciation rate, while the company claims a 2½ per cent depreciation.
9. Because sufficient depreciation has not been allowed since 1914.
10. Because the rate of 1.55 will return a yield of only 5.1 per cent on the valuation of the property, instead of 8 per cent as allowed under the rules of the Georgia Railway Commission.
11. Because the rates as established are confiscatory.
12. Because the court refused to allow sufficient value for increase in the value of the company's property since 1914.

It is claimed that in all of the above respects the decision contravenes the Fourteenth Amendment of the Constitution of the United States.

President Arkwright of the Power Company in summing up the company's appeal says:

There are questions of law involved in the case which are vital, and it is to the interest of the public and the company that these questions be finally determined by the United States Supreme Court.

The case was referred to in the ELECTRIC RAILWAY JOURNAL for Feb. 11, page 256.

East End Extension Being Agitated Again

Petitions calling for a special election on an initiative ordinance compelling the Cincinnati (Ohio) Traction Company to extend the East End car line to California are being circulated by the California Improvement Association as the result of a resolution adopted by the association. Announcement that the receiver for the Interurban Railway & Terminal Company operating through California would cease service March 25 and that the tracks would be torn up within sixty days were causes of the determination again to attempt to pass the ordinance by a vote of the people. The Public Utilities Commission has granted the Interurban Railway & Terminal Company the right to abandon its route between Cincinnati and California. Under a recent ruling of the Ohio Supreme Court a special election on the question is legal if held ninety days prior to the general election. The car extension issue failed at two previous regular elections.

Changes Proposed in New York Transit Law

An amendment to the public service commissions law to confine to such New York city traction companies as are included in the Transit Commission's plan of readjustment the power to authorize a change in the rate of fare previously fixed by contract, franchise or otherwise was incorporated in bills introduced in the Legislature on Feb. 27 by Senator William T. Simpson and Assemblyman George N. Jesse, both Republicans of New York. The amendment was recommended by the Transit Commission.

Three other amendments also are embodied in the measure. One seeks to give the commission power to compel continued through operation over all existing lines in New York City, with a view of meeting any possibility of service being broken or discontinued on any parts of the line of the Manhattan Elevated Railway Company.

Another is intended to make it clear that the valuations finally determined by the commission, "and incorporated in the contracts," shall be the basis for all allowances to be made to the railway companies and for fixing the returns "under the plan and the contracts entered into thereunder."

The fourth amendment authorizes and legalizes a proposed plan to give the commission power to organize the various operating companies, to permit their organization with a nominal capital stock and to enable the directors of the operating companies to be chosen by bondholders and others than stockholders. The amendment also provides for the detailed mechanism of incorporating these companies following in general the present provisions of the railroad law.

Subway Agitation Renewal in Chicago

Chicago may make a start on subways in the near future. Stirred by public agitation, the local transportation committee of the City Council on Feb. 22 named a board of engineers, to submit plans for an initial subway within sixty days. These engineers are: Bion J. Arnold, Harold Almert, R. F. Kelker, Jr., Joseph H. Pryor and Charles E. Fox.

Chairman Schwartz announced on behalf of the committee that plans would be prepared and if the surface and elevated companies are unwilling to co-operate an independent system may be started. Expenses can be paid out of the traction fund which now amounts to about $30,000,000. It was decided to follow as closely as possible the suggestions made in the Parsons-Arnold-Ridgway report of 1916. It has been estimated that a two-track subway for elevated trains can be built from Eighteenth Street to Chicago Avenue for about $10,350,000 and a subway for surface cars through the downtown district for $7,181,750.

Up to date the present companies have not seen their way clear to co-operate with the city on the subway suggestions.

According to the latest report filed by the Surface Lines with the Illinois Commerce Commission, the revenue from passengers for the year ended Jan. 31, 1922, amounted to $59,706,412, which after deductions left a return of 6.5 per cent on the purchase price. Revenue passengers carried were 750,515,622. The company's annual report will not be issued for several weeks.

New Suburban Service Established

The Columbus Railway, Power & Light Company, Columbus, Ohio, has made come true the dream of the dwellers in Columbus' northern suburban district, known as Clintonville. On Sunday, Feb. 26, it began a regular service from downtown to the suburban district, covering the 4 miles, through the congested business district and on through residence and suburban streets to the northern terminus, recently annexed to the city. Ten-minute service is being provided.

For a decade or more Clintonvillites have longed and prayed and worked for city railway service. They have it now and are duly appreciative. Sunday was a holiday in the real sense for them.

The run to Clintonville is being made over the Summit and Steelton line, which passes through the downtown section of Columbus on Third Street.

Saturday afternoon a party of company officials, City Councilmen, Mayor James J. Thomas and others made the first trip over the line to the northern suburb. The trip was extended to Worthington, a few miles north of the suburb, just to make the event one of interest to the village as well as to the suburb.

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Western Pacific Plans to Take Over Additional Lines of Sacramento Northern

At a special meeting of the stockholders of the Western Pacific Railroad Corporation held at Wilmington, Del., on Feb. 20, a proposal was unanimously approved, it was announced, for the issuing of first mortgage bonds of the Western Pacific Railroad for the purchase of additional lines of the Sacramento Northern Railroad, consisting of electric lines connecting with the main line of the Western Pacific.

The electric railways and the other properties of the Sacramento Northern are to be conveyed to the Sacramento Northern Railway, and the securities representing them are to be all the authorized capital stock of the Sacramento Northern Railway or all the capital stock except shares necessary to qualify directors and all of the outstanding mortgage bonds of the Sacramento Northern Railroad, or not less than approximately $5,165,000, the principal amount. The proposed payment for the purchase of the electric lines will exceed $1,000,000.

A second proposal was approved for the authentication of first mortgage bonds of the Western Pacific Railroad for the construction or extension of a line rfom Woodland to Vacaville, Cal., to a connection with the existing line from Vacaville to Willota, and through to Vallejo, if it is desired or deemed advisable by the board of directors.

The cost will exceed $1,000,000.

Traction Plan for New Development Before Council

The Evanston (Ill.) Street Railway has submitted a proposal to the City Council which includes transportation facilities for the west side of the city. The new west side line would be operated under the name of the Evanston West Side Railway, which later could be merged with the Evanston Street Railway. The company has sought the following concessions from the Council:

1. Granting of a twenty year franchise to the Evanston West Side Railway.
2. Extension of the franchise of the Evanston Railway for eleven years to correspond with the franchise of the new company.
3. Freedom from bus and jitney competition.
4. Freedom from paving streets on new west side lines until such lines are paying expenses and a profit.

Further Attacks Made on King Tax Measure

Another California railroad has *taken except* ion to the constitutionality of the King tax bill, adopted at the last session of the State Legislature. On Feb. 18 in the State Superior Court the Los Angeles and Salt Lake Railroad (Union Pacific System) brought suit through its attorneys, the plaintiffs demanding a return of $127,000, taxes paid under protest. The King tax bill was instituted and passed by the legislature to raise $15,000,000 additional taxes from public utilities of the State for conducting the State government. The legislative act provided that the steam road lines pay, under the new measure, 7¼ per cent of their gross income into the State, whereas the old State corporation tax law carried a rate of 5¼ per cent of the gross.

A number of suits attacking the constitutionality of the new measure, which exempted street railways from increased taxation, have been filed by various utilities. The street railways still pay 5¼ per cent of the gross income as taxes. Other utilities have paid the added tax and have been permitted to increase their rates to consumers accordingly.

This tax measure applies to all forms of public utilities, but exempts municipally owned power, water, light and street railway properties from any taxes. It has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

City to Hold Lien on Property

In order that Main Street may be paved—the work being held up because of the inability of the Jacksonville (Fla.) Traction Company to raise the money for its share—the city of Jacksonville will go ahead on the paper of the company, which is in receivership. The City Commission has authorized City Attorney P. H. Odom to take the necessary steps, in conjunction with Receiver E. J. Triay, to raise the $30,000 necessary for the company's share, the city in turn to hold a lien on the company's physical properties until the paper is paid up by the company. Ways and means are to be worked out by the attorney and the receiver and reported back to the commission for approval.

News Notes

Official Figures Published.—Official figures announced by the Ontario government, Canada, show that Thorold township returned an adverse vote on the by-law to acquire the Niagara, St. Catharines & Toronto Railway. This means four of the seventeen municipalities rejected the proposal.

One-Man Cars Allowed.—The Board of Aldermen of the city of Providence, R. I., at its annual meeting on Feb. 16 changed the ordinance relative to the operation of electric railways which required trolley cars carrying passengers to be under the control of two men. The amendment will permit the use of one-man cars by the United Electric Railways Company.

Council Adopts Franchises.—The City Council of Dubuque, Iowa, recently passed the railway and lighting franchises of the Dubuque Electric Company. The measures will be submitted to a public vote at the spring election on March 27. A twenty-five-year extension has been sought by the railway, which officials claim is necessary to enable the company to market its securities and make improvements in service.

Free Official Rides to be Listed—Mayor Julian M. Smith of Augusta, Ga., has asked for a list of all city officials who rode free on lines of the Augusta-Aiken Railway & Electric Corporation of South Carolina, Augusta, Ga. According to a statement of the general manager of the company, city officers rode more than 36,000 times in 1921 at the expense of the railway.

Legislative Bodies Approve Appropriation.—The New Jersey House of Assembly and the Senate have passed the Evans' bill to appropriate $25,000 for the Board of Public Utility Commissioners to oppose the attempt of the Public Service Railway to make permanent the 8-cent fare which the company was authorized to charge temporarily by the Federal Court.

Agreement Effected.—Arrangements have been completed whereby the Cincinnati (Ohio) Traction Company is to make up any deficit of the Fairview Incline Company, caused by the operation of the incline. In consideration of this agreement the incline company is to honor the traction company's transfers, so that passengers will not have to pay an additional fare to use the incline. The contract is to be in force until Jan. 1, 1923.

Railway and Bus Clash.—Competition has started between the motor bus line and the Cleveland, Southwestern & Columbus Railway, which runs between Bucyrus and Galion. The fare charged by the railway and the bus is the same, 20 cents, but the electric line has asked the County Commissioners to change its franchise so as to permit a rate of 3 cents per mile. The distance is 11 miles with a brick road paralleling the interurban for the entire distance.

Self-Propelled Motor Car Replaces Trolley.—The Cape Fear Railways, Inc., as purchaser of the properties of the Cumberland Railway & Power Company, Raleigh, N. C., is engaged in completing a gasoline-propelled transportation system of 20 miles running from Massey Hill south to Fayetteville, through Fayetteville and westward to Camp Bragg. The company plans to construct 5 miles of additional track over which it is intended to operate gasoline-propelled rolling stock.

Wages Reduced.—The Sacramento Northern Railroad, operating in Chico, Cal., announced on Feb. 22 a wage reduction of 5 cents an hour for motormen and conductors in the interurban passenger service and a reduction of 7½ cents an hour for motormen and conductors in the freight service, effective Feb. 16. The wages of brakemen and Sacramento street car employees are not affected. Under the new schedule the passenger service men will receive 57½ cents an hour and freight men 62½ cents. The reduction, it was announced, is in keeping with general business conditions at present.

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Financial and Corporate

P. R. T. Net $1,807,292

Outlook for 1922 Particularly Bright, with Prospect Ahead for Resumption of Dividend Payments

The net income of the Philadelphia (Pa.) Rapid Transit Company in 1921 was $1,807,292. This compares with $382,065 in 1920. W. C. Dunbar, vice-president, explains that in accordance with the published policy and program for 1921, the net income of $1,807,292 was spent to improve the condition of the property. Deferred maintenance, due to wartime conditions, was overcome during the year, and the reserve ample to pay present rentals to underlying companies and 6 per cent upon the $30,000,000 of Philadelphia Rapid Transit paid-in capital.

Expert testimony has been presented, according to Mr. Dunbar, showing that the accomplishments of men and management represent an annual saving to the car riders of over $16,000,000. According to Mr. Dunbar nothing less than a 10-cent fare would have been required, had only ordinary operating methods prevailed.

The earnings, efficiencies and economies effected by co-operative effort are summarized by Mr. Dunbar as follows:

Passenger receipts approximating $7,000,000, induced by superior salesmanship—producing a net revenue of	$2,400,000
Advertising receipts attributable to better marketing of available space	300,000
Saving in operating costs due to scientific car scheduling and routing and increased speed aided by skip stop	8,350,000
Increased energy production per unit of fuel consumed and saving in power demand account lighter weight of nearside cars	1,800,000
Accident prevention work and enlightened policy of claim settlements	1,500,000
Developed production in car repair shops, refinements in methods of painting and maintenance of car bodies and equipment	900,000
Accelerated track relaying and repair	140,000
Improved fare collection and station methods on subway elevated	210,000
Benefits derived from low ratio of labor turnover	160,000
Savings account bulk purchases, standardization and reduced handling of supplies	260,000
Reduction in fire insurance premium rate in recognition of improved housekeeping and fire prevention methods	100,000
	$16,120,000

fund for renewals re-established at $1,671,679 as against the amount of $1,500,000 set up in 1911.

Mr. Dunbar says that critics for the city assert that the present upkeep appropriations are too high, and other critics contend that they are too low but that Charles Hansel and George W. Fuller, eminent engineers who have spent two years in examining the property, have certified that the property is maintained in an appropriate operating condition and that present appropriations are necessary to maintain its present condition.

According to Mr. Dunbar, Philadelphia Rapid Transit's annual net earning capacity, with present wage reductions, now approximates $3,000,000, after paying all operating expenses, fixed charges and taxes. This will provide $1,800,000 for the proposed 6 per cent dividend on Philadelphia Rapid Transit stock, leaving upwards of $1,000,000 otherwise applicable to payment of back dividends, which must now be used to finance expenditures for betterments and improvements. There is no other source from which to draw, until Philadelphia Rapid Transit's credit, made worth-while by continued payment of dividends, is sufficiently established to make Philadelphia Rapid Transit's guarantee good, so that track extensions and other additions to property may be thereafter financed under the terms of the 1907 city agreement.

Mr. Dunbar says that Philadelphia Rapid Transit's proved property value, before Public Service Commission, is sufficient to insure a continued return,

Only 1,606 suits against the company are now pending for unsettled accidents, as against 4,953 unsettled suits inherited in 1911 from former management. In 1921 2.55 per cent of operating revenue was required for accident costs, as against 6.21 per cent required in 1910.

Fixed charges now represent only 23.27 per cent of operating revenue, while 46.27 per cent was required in 1910.

INCOME ACCOUNT OF PHILADELPHIA RAPID TRANSIT COMPANY

	1921	1920
Gross passenger earnings	$41,514,830	$37,989,623
Other operating revenue	905,775	817,731
Railway operating revenue	42,420,605	38,807,354
Way and structures and equipment—maintenance, renewals and depreciation	8,136,800	5,595,600
Power — maintenance, renewals and depreciation and operation	3,675,788	3,728,027
Conducting transportation	13,330,470	13,748,926
General	3,291,709	3,521,358
Taxes, including paving tax	2,798,820	2,601,252
	31,233,589	29,195,165
Operating income	11,187,016	9,612,188
Non-operating income	490,434	592,986
	11,677,451	10,205,175
Interest	1,029,245	976,462
Rentals	8,720,913	8,726,647
Sinking fund—city contract	120,000	120,000
	9,870,158	9,823,110
Net income	$1,807,292	$382,065

President Mitten of the company reviews the controversy for control, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL, saying that a dividend of 6 per cent for 1922, with present earnings, is assured, unless prevented by disruption of the present effective combination of men and management. He says that in the eleven years that followed 1911-1921 the company earned a surplus of $11,595,494. Of this total $5,846,514 has been paid in dividends and $5,748,980 has been put back into the property. According to Mr. Mitten, Philadelphia Rapid Transit stockholders have been enriched by new values, created by co-operation of men and management, "who have thus earned the right to demand that the result of their co-operative effort be not destroyed, nor the management changed to endanger the continuation of their forward progress." He explains that the payment to Philadelphia Rapid Transit employees for super co-operation during 1922 is proposed, in an amount not to exceed 10 per cent of Philadelphia Rapid Transit payroll, after paying 6 per cent dividends to stockholders.

Mr. Mitten says that his agreement covering the direction of Philadelphia Rapid Transit affairs, unchanged since 1911, expires March 31, 1922, and will be continued, providing Philadelphia Rapid Transit stockholders assent to the proposed financial participation by employees in the result of further co-operative accomplishment.

Commission Approves Partial Abandonment

The Public Service Commission of New York has approved a declaration of abandonment by the International Railway, Buffalo, of a part of its old Buffalo-Niagara Falls line. The part to be abandoned is between North Tonawanda and LaSalle in the town of Wheatfield. The company is ordered, however, to arrange for the protection of the rights and equities of the holders of certain bonds issued under a mortgage by executing a trust agreement to contain specified conditions. The railway has agreed to make certain improvements on the old Buffalo-Niagara Falls line, thereby increasing the value of the road continued in operation.

The line abandoned is 7.12 miles in length. The company claimed there was little necessity for the old Buffalo-Niagara Falls line as the new high-speed line between the cities serves all purposes. The operating loss on the line in 1920 was $86,108 and for the first six months of 1921 it was $65,557.

Ottawa Traction Makes Report

In the eighth annual report of the Ottawa (Ont.) Traction Company Ltd., T. Ahearn, president, states that the amount received from The Ottawa Electric Railway during the year ended Dec. 31, 1921, was $279,060. He said that this amount paid for the usual quarterly dividends of 1 per cent and a bonus of 1 per cent. The efficient condition of the railway's plant and equipment was made a subject for comment in the report.

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$116,462 Deficit for Chicago-Kankakee Line

The annual statement of the Chicago & Interurban Traction Company, Chicago, Ill., which operates from Chicago to Kankakee, showed a net deficit of $116,462 for the year ended Dec. 31, 1921, as compared with a net deficit of $37,701 in 1920. The net operating loss for the year, of $1,844, is compared with net operating revenue of $62,138 in 1920 before interest and taxes. The gross revenue from transportation was $373,607 as compared with $444,537 in the previous year.

	Dec. 31, 1921.	Dec. 31, 1920.
Revenue from transportation	$373,606	$444,537
Other revenue	36,770	5,345
Total	$410,376	$449,882
Operating expenses	412,221	387,743
Net operating revenue	$ 1,844	$ 62,138
Interest and taxes	114,618	99,840
Deficit	$116,462	$ 37,701

Details of the statement for the year ended Dec. 31, 1921, as compared with the previous year, are shown in table above.

Back Dividend Payments Liquidated

The Federal Light & Traction Company, New York, N. Y., has issued a circular to its stockholders in connection with the readjustment of its finances and the stock dividend of $42 a share on its preferred stock which has just been declared.

New certificates for the number of shares of preferred stock represented by certificates which are surrendered bear substantially the following statement:

The accumulated dividends from Sept. 1, 1914, to Sept. 1, 1921, on the stock represented by this certificate have been paid in preferred stock (6 per cent cumulative) which has been accepted by the holder of said stock in satisfaction of said accumulated dividends. All certificates issued upon transfer of the stock represented by this certificate will bear this statement.

No certificate will be issued for a fractional share, but scrip will be issued for such fractional shares as may be required. Scrip for fractional shares will not bear dividends, but all accrued dividends when, as and if declared, are payable on the stock represented by scrip will be payable to the first registered holder of the stock.

The Dec. 1, 1921, quarterly dividend of $1.50 a share has been declared payable on March 11, 1922, to preferred stockholders of record at the close of business on March 6. It will be paid on the 25,000 shares of preferred stock now outstanding. This method of payment has been adopted for the convenience of stockholders who receive the preferred stock dividend.

It is the desire and intention of the directors that the preferred stock issued in payment of the stock dividend shall participate in the March 1, 1922, quarterly dividend, but the board has advised that dividends should not be declared except on outstanding stock. The board therefore has decided to defer the declaration of the March 1, 1922 quarterly dividend until after March 15, 1922, in order to enable the holders of the preferred stock to receive their stock dividend before the March 1, 1922, dividend is declared. The preferred stockholders are therefore urged to surrender their certificates promptly so that the March 1, 1922 quarterly dividend may be paid at the earliest possible date.

Columbus Property Extended

The Columbus Railway, Power & Light Company, Columbus, Ohio, with the approval of the State Utilities Commission has recently acquired by purchase from the Columbus, Delaware & Marion Electric Company more than 6 miles of its track from Summit and Hudson Streets in the north end of Columbus, on northward to and through the village of Worthington. This purchase has solved a problem that has existed for some time due to the fast residential development in the north end of the city which is spreading to Worthington. The Columbus, Delaware & Marion continues an operating privilege until it may within a stated time complete a new line for the same distance, which more isolated, will permit it to quicken time—the matter of time being an important factor with the interurban line between this city and Marion.

$29,033,000 Louisville Railway Value

In his remarks to stockholders in presenting the annual report of the company for 1921 James P. Barnes, president of the Louisville Railway, reminded the stockholders that at the time of last year's meeting they were notified that the board of directors had engaged the J. G. White Engineering Corporation to make an appraisal of the physical properties of the company and estimate the cost of reproduction. This work was started on Feb. 25, 1921. Sometime later the city of Louisville appointed an expert, David C. Caldwell, consulting engineer, of Wilmette, Illinois, to make a similar appraisal for the use of the city in the fare proceedings or negotiations with this company.

Mr. Barnes said that the J. G. White Engineering Corporation's report of appraisal was presented on Nov. 1, 1921. It covered a very thorough and complete analysis of the company's property in the city system. The cost to reproduce the Louisville Railways urban property as of April 1, 1921, was found by the J. G. White Engineering Corporation to be $29,033,900. Mr. Barnes said these data are now in shape to be used in presenting the claims of the company for a fair rate of return before a court or special master, or as a basis for negotiation and discussion of these matters with the proper authorities.

Engineer Recommends Abandonment of Twenty-Six Surface Lines

Recommendation that twenty-six of Brooklyn's seventy-one surface car lines be abandoned, some of them to be absorbed in part by surviving lines, was made on March 1 to the New York Transit Commission in a tentative rerouting report made by Daniel L. Turner, consulting engineer of the Commission. A public hearing on the plan will be held on March 6.

Among the more important lines it is planned to drop are the Myrtle Avenue, Sixty-fifth Street-Bay Ridge, Reid Avenue, Smith Street and St. Johns Place lines. In most instances the plan points out that considerable stretches of the abandoned systems can be taken over by other lines.

The tentative rerouting plan thus provides for the utilization of about 356 of the present 504 miles of track in Brooklyn streets. Of the 148 miles to be dropped entirely, 30 are now out of operation.

The plan says that "the function of the surface car systems in Brooklyn and Queens in the future, to a greater and greater degree, will be to provide for the local travel within the boroughs themselves, and to supplement and feed the rapid transit lines—not compete with them. In outlying sections of Brooklyn, where existing surface lines are not retained, bus lines should be established along such routes as will best feed the rapid transit lines."

In commenting on the plan, Chairman George McAneny said:

These recommendations will be consulted by the commission through its further examination of this matter publicly. Any definite action taken in the matter of rerouting will follow the plans and will be made subject to proper hearings, at which everybody will have an opportunity to be heard.

This report, however, and the preceding reports on the same subjects, covering Manhattan, are extremely valuable in the view of the commission and will approximate, at least, the action that in our judgment should finally be taken.

York Railways Income Decreases $29,600

A decrease of $29,600 in the net income of the York (Pa.) Railways for the year ended Nov. 30, 1921, as compared with the net income for 1920, is reported by Gordon Campbell, president, in his annual report. Net income for 1921 is $207,001 and for 1920 $236,602. While operating expenses remained practically the same, gross receipts from railway operation decreased $55,376. Taxes increased $7,211 over 1920.

	1921	1920
Gross earnings	$1,720,417	$1,679,122
Operating expenses	1,161,654	1,097,205
Taxes	122,471	115,260
	1,284,125	1,212,465
Net earnings	436,291	466,657
Interest and bond Discount	229,290	230,055
	$ 207,001	$ 236,602

The comparative income statement as shown in the table above includes both railway and lighting operation.

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Toledo Has Best Month

Operation Cost Down to Finer Point than Ever Before, Says Railway Commissioner

Operations of the Community Traction Company, Toledo, Ohio, for January, the twelfth month under service at cost, returned a surplus of $6,519 over all expenses and payments to funds. This is the best month's showing since the new ordinance has been in effect. Street Railway Commissioner W. E. Cann declared that the elimination of part of the bus competition had been largely responsible for the good showing.

During January both net earnings and gross receipts showed decreases from December figures, but the ratio of operating expense to gross income showed a decrease also of 2.45 per cent. Passenger revenue decreased 0.91 cents per car-mile, while operating expense was cut 1.61 cents per car-mile. Car mileage was cut 0.137 per cent. A total of 5,103,295 passengers were carried, of which 4,966,786 were revenue passengers.

During January $35,000 was credited to maintenance and repair fund, the ordinance requirements as to depreciation and sinking funds were complied with and $16,000 was set aside for taxes.

There is now a deficit of $318,516 in the stabilizing fund. Mr. Cann points out that this is less than the savings in fare that have been made to car riders in the first eleven months of operation.

At the end of January there was $70,504 in the fund set up for tax payments. Payments totaling $55,455 had been made during the month.

In his talk to members of the Chamber of Commerce at a noon luncheon one day during the week ended Feb. 25 Mr. Cann pointed out some of the accomplishments of the new street railway control during the year 1921. He said:

> We started the cost-of-service ordinance under the most unfavorable conditions I have ever known. The fare for six months provided us with a deficit of $350,000, but it put us on our toes on operation, and we now have operating costs down finer than in any previous experience that I have known. They are down to rock bottom, with the exception of what lowering can come through material and labor reductions.
>
> The service has been improved. Last February we were operating 105.5 trips an hour, which was increased to 112 trips an hour in December. During rush hours we operated 106 trips an hour in February and 173 trips an hour in December.
>
> Speed of cars has been increased from 8.8 m.p.h. in February to 9.44 m.p.h., in December. The rush hour speed has been increased from 8.43 m.p.h., to 9.38 m.p.h. Double loading has helped.
>
> To indicate service control, I can say that out of 200 cars checked last week on the East Broadway line only four were more than two minutes of schedule. That is notwithstanding the fact that we have forty railroad crossings to contend with.

Mr. Cann showed that the railway industry is a home-city business. He said $1,688,937 was paid in wages to the 1,250 employees of the company during the year, which amounted to 53.6 per cent of the entire revenues. At least 60 per cent of materials was purchased in Toledo and part of the power cost went into Toleda labor and materials. At least 75 per cent of the total revenue was spent in Toledo.

He showed that the average fare was 6.68 cents, as compared with the average of 7.2 cents for all cities of more than 50,000 people excluding New York.

Wants Legislation for Company's Relief

Because of purported losses sustained by the Southern Pacific Company through the operation of its railway line in Salem, Ore., the management of the corporation has sent to the City Council of Salem a letter suggesting legislation which would tend to relieve the company of a part of its present financial burdens. The company urges the amendment of an ordinance providing for twenty-minute service on one of its longest lines to a thirty-minute schedule, exemption of the traction corporation from hard-surfacing any streets not paved at the present time, elimination of the ordinance requirement of a 72-lb. rail in favor of a 60-lb. rail, abandonment of what is known as the Summer Street line, and adoption by the Council of a resolution favoring a 6-cent cash fare, and a 5½-cent fare when tickets are purchased in books of fifty.

Columbus Company to Pay Back Dividends

For the first time since the present management of the Columbus Railway, Power & Light Company, Columbus, Ohio, took charge, the utility is to pay dividends. This was announced during the week ended Feb. 25, concurrently with the filing of an application with the State Public Utilities Commission for authority to issue $1,228,996 of preferred stock, representing accumulated and unpaid dividends covering the past four years.

At the same time it was made public that with the ensuing year the payment of dividends will be made in cash, a welcome novelty for stockholders. The proposed stock payments represent a dividend of 6 per cent, amounting to a total of $392,376, on the company's Series A preferred stock, as of April 1, 1922, and of 5 per cent, or $836,620, on Series B preferred, as of Feb. 1, 1922.

Issuance of preferred stock in lieu of cash dividends at this time is shown to be necessary because of the inability of the company to sell its capital stock economically during the past four years, and because it cannot hope to sell any stock at this time to procure the wherewithal to reimburse its treasury for capital expenditures unless the market value of its outstanding stocks shall be brought to par. To pay accumulated dividends in cash would militate against bringing its stock back to par, the application avers.

A surplus of $2,067,350 in assets over liabilities is reported, as of Jan. 1, 1922.

Stone & Webster Properties Submit Report

Results of operation during 1921 compared with 1920 on the lines of the Eastern Texas Electric Company, El Paso Electric Company, Columbus Electric Company, Galveston-Houston Electric Company, Tampa Electric Company and Paducah Electric Company, all Stone & Webster properties are given in the following tables. The Tampa Electric Company had the largest balance for the year 1921.

EASTERN TEXAS ELECTRIC COMPANY
BEAUMONT, TEX.

	1921	1920
Gross earnings	$1,670,328	$1,619,242
Operating expenses and taxes	1,097,530	1,009,676
Net earnings	$572,798	$609,566
Income from other sources†	12,400	7,490
Balance	$585,198	$617,056
Interest and amortization charges	230,787	193,890
Balance for reserves, replacements and dividends	$354,410	$423,165

†Income from Securities of Port Arthur Ice and Refrigerating Co.

EL PASO (TEX.) ELECTRIC COMPANY AND SUBSIDIARY COMPANIES

	1921	1920
Gross earnings	$2,290,405	$1,931,629
Operating expenses and taxes	1,592,236	1,327,170
Net earnings	$698,168	$604,458
Interest and amortization charges	158,318	113,481
Balance for reserves, replacements and dividends	$539,850	$490,977

COLUMBUS (GA.) ELECTRIC COMPANY AND SUBSIDIARY COMPANIES.

	1921	1920
Gross earnings	$1,807,298	$1,547,353
Operating expenses and taxes	798,069	964,990
Net earnings	$1,009,228	$582,362
Interest and amortization charges	395,803	382,224
Balance for reserves, replacements and dividends	$613,425	$200,137

GALVESTON-HOUSTON (TEX.) ELECTRIC CO.

	1921	1920
Gross earnings	$3,679,867	$3,808,952
Operating expenses and taxes	2,760,887	2,682,447
Net earnings	$918,979	$1,126,504
Interest and amortization charges	426,636	422,056
Balance for reserves, replacements and dividends	$492,343	$704,448

TAMPA (FLA.) ELECTRIC COMPANY.

	1921	1920
Gross earnings	$1,715,903	$1,473,629
Operating expenses and taxes	1,027,525	914,935
Net earnings	$688,378	$558,694
Interest and amortization charges	52,494	52,498
Balance for reserves, replacements and dividends	$635,883	$506,195

PADUCAH (KY.) ELECTRIC COMPANY.

	1921	1920
Gross earnings	$529,886	$483,569
Operating expenses and taxes	395,366	347,241
Net earnings	$134,519	$136,327
Interest and amortization charges	96,795	75,090
Balance for reserves, replacements and dividends	$37,723	$61,237

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Net Income Shows Net Decrease in Duluth

The Duluth-Superior Traction Company, Duluth, Minn., reports a total railway operating revenue for 1921 of $1,777,330 against $1,919,579 in 1920. The total railway operating expenses decreased from $1,585,900 for the year 1920 to $1,493,305 for the year just ended. The net income transferred to profit and loss amounted to $28,587 against $73,848, or a net decrease of 61.3 per cent. In submitting its yearly report to the stockholders, A. M. Robertson, president of the railway, said that the management realizes the necessity of continuing the present reduced service, and if possible devising new economies in operaing costs, until an increase fare is permitted in the city of Duluth.

American Cities Collateral Sold

As the application of the committee representing 10 per cent of the preferred stockholders of the American Cities Company has been denied and the sale of the securities has been conducted which were pledged with the Whitney Central Bank & Trust Company, New Orleans, as collateral, it is not conjectured that any further effort will be made to block the reorganization plan of the bondholders of the American Cities Company. Each holder of an undeposited $1,000 bond of the American Cities Company will now receive from $450 to $475 in cash unless the bondholders' committee can effect some other means of taking them on.

The depositing bondholders will receive new securities in the National Power & Light Company. For each $1,000 bond, there will be given one $500 7 per cent income bond; 2½ shares of preferred stock and 3½ shares of common stock in the National Power & Light Company.

The preferred stockholders will have the right for each twenty shares of American Cities preferred stock now held to subscribe for a $100 7 per cent income bond and seven shares of common stock in the National Power & Light Company, upon payment of $242.50 cash.

Twin City Earnings Amount to $487,305

For the year ended Dec. 31, 1921, the Twin City Rapid Transit Company, Minneapolis, Minn., realized a total railway operating revenue of $13,865,582 against $12,986,406 for 1920. The earnings for 1921 after paying expenses and making allowances for depreciation and the payment of the quarterly dividends on the preferred stock at the rate of 7 per cent per annum amounted to $487,305.

In his report to the stockholders dated Jan. 24, 1922, Horace Lowry, president of the property, told of some of the important work which had been accomplished during the year just ended. He said that the work of constructing front exits on 300 cars had been completed and twenty-five cars of the company's older type had been converted into trailers which were being operated successfully. He said further that there had been developed a new two-car train having a seating capacity more than double the company's present standard double truck car. In his opinion the operation of such trains will increase the efficiency of the system and greatly improve transportation for the public.

Charlottesville Net Is $42,097 —Five-Cent Fare

A net surplus of $42,097 for the year ending Dec. 31, 1921, of the Charlottesville & Albermarle Railway, Charlottesville, Va., is shown in the president's annual report. In 1920 the net surplus was $24,021. The company operates at a 5-cent fare. The comparative statement follows:

Gross earnings:	1921	1920
Railway	$ 72,657	$ 60,226
Light and power	163,899	138,003
Total	$236,556	$198,229
Operating expenses:		
Railway	50,482	42,754
Light and power	68,679	67,999
Total	$119,161	$110,753
Net earnings	117,395	87,476
Fixed charges	37,633	35,499
Amount available for dividends	$ 79,762	$ 51,977
Dividends paid on preferred stock	8,589	8,589
	71,173	43,383
Miscellaneous income	1,424	633
Surplus	$ 72,597	$ 42,021
Depreciation	20,000	20,000
Income tax	10,500	
Total	$ 30,500	$ 20,000
Net surplus	$ 42,097	$ 24,021

Exceeds Authorized Return

The Dallas (Tex.) Railway exceeded its authorized return of 7 per cent on its invested capital during January, this year, according to a report filed in the office of John W. Everman, supervisor of public utilities. The report shows gross earnings of $259,448 and gross operating costs of $145,732, leaving a balance of $115,716 for reserves and return on the invested captal. Deducting $38,876 for reserves, as required by the franchise, a balance of $56,840 is shown. The authorized return of 7 per cent on the invested capital amounts to $54,764 which leaves an excess of $2,076 for the surplus reserve. This amount is credited against the accumulated deficit in the authorized return, now amounting to nearly $1,000,000.

San Francisco Municipal Line Has $9,484 Surplus

The San Francisco (Cal.) Municipal Railways reports a net income for the month ended Dec. 31, 1921, of $9,484. Receipts for December amounted to $253,132, and total operating expenses climbed to $178,017, leaving a total of $75,115, before depreciation, compensation insurance fund and interest. These three items amounted to $65,631, leaving a surplus of $9,484 for the month.

Financial News Notes

Net Realized of $74,346.—For the month of January, 1922, the Market Street Railway, San Francisco, Cal., reports a railway operating revenue of $764,885 and a railway operating expense of $579,612. The gross income amounted to $138,017 from which deducting bond interest, etc., a net income remains of $74,346.

Good Showing for January in Boston. —The total receipts of the Boston (Mass.) Elevated Railway for January, 1922, amounted to $2,837,057 against $2,930,072 for the same month a year ago. The total operating expenses were $1,831,474 against $2,062,146. The total "cost of service" for the month was $2,633,783. The excess of "receipts" over "cost of service" was $203,274, an increase of $92,372 over January, 1921.

New Issue Offered.—Bonbright & Company, New York, N. Y., are offering $1,000,000 of the Tri-City Railway & Light Company's first and refunding mortgage 5 per cent gold bonds. The bonds are dated July 1, 1910, and are due July 1, 1930. The price is 92 and accrued interest, yielding about 6.25 per cent. The Tri-City Railway has outstanding, including this issue, $11,750,000.

Negotiations for Sale in Prospect.—It appears that negotiations have been completed for the sale of the defunct Norwalk-Shelby line to the Wilkoff Syndicate, Pittsburgh, Pa. A certified check of $10,000 has been deposited with G. Ray Craig, Norwalk, master commissioner of the company. Formal approval of the sale by Federal Judge Killits is expected soon. Operation was suspended by the traction line last March.

Stock Issue Offered.—The Hagerstown & Frederick Railway operating in Cumberland, Md., has inaugurated a Community Partnership Policy, which is simply the extension to its customers and the public of a plan whereby they may become partners in the business. The company announces the issue of $200,000 par value of its 7 per cent cumulative preferred stock at $50 a share, which is the par value. It is the plan that this entire issue be taken by local people.

Suburban Road Sold Under Foreclosure.—The property of the Syracuse & Suburban Railroad, Syracuse, N. Y., was sold under foreclosure on Feb. 24 to I. D. Vann for $10,000. Mr. Vann represented J. M. Steer of the Girard Trust Company, Philadelphia, chairman of the first mortgage bondholders' protective committee. The sale was made under proceedings brought by the Fidelity Trust Company, Philadelphia. The first mortgage due was for $485,722 and the second mortgage $150,000.

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Traffic and Transportation

Experimental Fare Periods Extended

The Public Utilities Commission of Connecticut announced on Feb. 28 that the 5-cent fare would continue in Bridgeport until further orders. The commission's order for the ninety days test contained a provision for its continuance until the commission ordered otherwise. The period of the test expired on Feb. 20, but the 5-cent fare order continues in force. This applies equally to the rate of fare charged in Norwalk. Connecticut Company officials have stated that no tokens allowing for three rides for 25 cents would be sold for those two divisions as they are under the Public Utilities Board order as regards rate of fare.

Lower Fare in Prospect

Car riders in Cleveland, Ohio, will very likely have their car fare reduced early this coming summer, if the same gradual but steady improvement in business conditions that has been manifest for the past several months continues. That is just disclosed by the January report of the Cleveland Railway, read to the company directors on Feb. 23.

This report shows that the company in January earned a surplus of $1,973 over and above all expenses. The deficit in the interest fund has now been reduced to $87,061, and the grand total surplus in the company's operating reserve fund, including $28,298 accumulated in January, is $442,748. The company carried a total of 32,876,191 passengers in January, a slight increase over the previous month.

The company's fiscal year ended last month, at which time the surplus in the operating fund was transferred to the interest fund, giving the interest fund a surplus of more than $350,000. The interest fund is the fare barometer, and when it contains $700,000 the fare must automatically be reduced one notch.

Fare Referendum Will Not Be Submitted

No referendum on the question of a 5-cent fare with a tax levy to liquidate the resulting deficit in the Seattle (Wash.) Municipal Railway will be submitted to the voters of Seattle at the May election. Councilman C. B. Fitzgerald's measure, providing for such a referendum, was defeated in the Council recently by a vote of five to three.

One reason for the defeat of the ordinance was the decision of three Councilmen to vote against it, in order that Councilman Erickson's plan to load the entire cost of operation and maintenance of the railway upon the general fund should go to the voters as a clear-cut issue, so that it may be defeated once and for all. The 5-cent fare referendum proposed by Councilman Fitzgerald would, it is believed, cloud the issue and leave the Erickson plan in the offing for another year, so that taxpayers and prospective taxpayers would not know whether to expect the 18 mills addition to the tax levy which it is estimated would result from the Erickson scheme.

Witt Suggests Solution of Traffic Problem

In answer to the query of *The Press* as to the solution of the traffic problem in the Public Square of Cleveland, Ohio, Peter Witt, traffic expert, suggests a plan with the conveniences of loading and unloading at one place, immunity from traffic dangers and protection from storms when transferring. The three outstanding features of the plan are to keep vehicular traffic out of the Public Square altogether, prohibit parking there at any time, and loading all Square trolley traffic from one platform extending the length of Ontario Street through the Public Square with a sheltered inclosure in the center.

Washington Fares Reduced

Slight Concession to Purchasers of Tokens Is Ordered by Commission—Legislative and Merger Program Failed

Effective March 1, the Public Utilities Commission of the District of Columbia reduced the rate of fare on the electric railways in the national capital from the present basis of five tokens for 35 cents to six tokens for 40 cents, but maintaining the present 8-cent cash fare.

ON JULY 29, 1921, the commission issued an order reducing fares on the lines in the District of Columbia from 8 cents cash, or four tokens for 30 cents, to 8 cents cash or five tokens for 35 cents, these rates to be effective until March 1, 1922, on which date they were to be restored automatically to those in effect on Oct. 18, 1919, unless on or before March 1, 1922, the commission should order otherwise.

On Jan. 12, 1922, the commission announced its intention of holding a public hearing to consider the question of the rates of fare to be effective on and after March 1, 1922, with particular reference to correlated operating subjects which it listed under nine different heads.

In its decision just rendered, the commission before proceeding to a discussion of the testimony given at the public hearings on these several questions on Feb. 1 and 2, 1922, says it felt it should state its position on the question of whether the rate of fare for all the companies in the District of Columbia should be uniform or whether each company should be considered separately and such a rate of fare established for it as will enable it to earn a fair and reasonable rate of return upon the fair value of its used and useful property. It was contended by both the Capital Traction Company and the Washington Railway & Electric Company, that the rate of fare should be uniform. It was contended with equal force by the representatives of the Federation of Citizens' Associations that, under the provisions of the public utilities act, the commission has no authority to consider these two companies as one and must establish separate rates of fare for each. The position which the commission took on Oct. 18, 1919, is in effect that the two systems are so related that if the present character of service is to be maintained, much less improved, it is deemed imperative that uniform rates be maintained on the two systems.

At that time the commission said that it was true that the disparity in the net earnings of the two corporations is very great; that every proper means of correcting this disparity should be taken and that a big step toward this end lay in modifying the provisions of the law under which street railway companies are required to pay into the public treasury 4 per cent of their gross revenues.

In carrying out its expressed intention to seek remedial legislation a bill was introduced in the House of Representatives on Jan. 25, 1920, the principal provisions of which contemplated a change in the method of taxation from the present 4 per cent tax on gross receipts to a tax of 50 per cent on net income in excess of 6 per cent return

CAPITAL TRACTION COMPANY

Earned in excess of a 7 per cent return in 1919, actual	$ 372,268
Earned in excess of a 7 per cent return in 1920, actual	536,016
Earned in excess of a 7 per cent return in 1921, actual	584,309
*Estimated earnings in excess of a 7 per cent return, 1922	517,479
	$2,010,072

WASHINGTON RAILWAY & ELECTRIC COMPANY'S SYSTEM

Amount by which the combined companies failed to earn a 7 per cent return:	
Actual, 1919	$ 780,444
Actual, 1920	401,919
Actual, 1921	121,761
*Estimated, 1922	458,553
	$1,762,677
Net amount paid in excess of 7 per cent return on fair value of all companies	$ 247,394

*Estimates as made by companies, unchanged.

Returns are based upon weighted average fair value for each year, as found by the commission.

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and 75 per cent on net income in excess of 7 per cent return, with no tax if the net income is less than a 6 per cent return. Since that time twelve other bills have been introduced in the House of Representatives and five in the Senate, all seeking to provide some form of relief to the public from high fares.

Remedial Legislation Failed

The remedial legislation has all failed and the effort also failed which was made to bring the two companies together in voluntary consolidation. Under the circumstances the commission felt that it should adhere to its position to keep the rates of fare uniform. Any other policy, it felt, would bankrupt the weaker carrier.

The effect of maintaining a uniform rate of fare for these two companies during the past three years, including the effect for the present year at the existing rates if this policy be continued, is shown by the commission on the preceding page.

The fair value of the properties of the Capital Traction Company and of the Washington Railway & Electric Company system, as of Dec. 31, 1921, was, respectively, $15,865,798 and $17,469,527, or a total of $33,335,326, based upon the commission's findings. These figures included the net amounts of additional property placed in service during 1921, at the actual cost thereof. The commission says that in calculating the rate of return earned by each of these companies during that year the weighted average of the 1921 additions should be taken, not the full amount of such additions. This would reduce the fair value figures just given to an average fair value for each company of $15,734,221 and $17,236,409 respectively. On this basis the rate of return actually earned during 1921 becomes 10.73 per cent for the Capital Traction Company and 6.25 per cent for the Washington Railway & Electric Company system. If these two principal street railway companies be considered as one, their combined operations during the year 1921 will show a rate of return of 8.38 per cent upon the commission's findings of fair value.

Company Protested Valuation

The commission says that these earnings are in excess of what may be expected in 1922, principally because the rate of fare during the first eight months of that year was higher than the present rate. The estimates for the two companies for 1922 at the present rates of fare show a rate of return on the fair values as of Dec. 31, 1921, of 10.26 per cent and 4.375 per cent, respectively, or a combined rate of return of 7.17 per cent. Expressed in dollars, this amounts to $58,926.13 in excess of 7 per cent return on the combined fair value.

In the petition submitted by the Washington Railway & Electric Company at the opening of the case the company discussed the question of the fair value of its property as a basis for fixing rates. The position it took then that the basis of the valuation was unfair was also discussed by the president of the company in his testimony, the claim being made that the cost of reproduction, using the commission's basis and quantities as of July 1, 1914, and using the present costs, shows that the property at this time would cost over $10,110,606 more than the figures used by the commission. A similar claim was made at the hearing by the Capital Traction Company, the increase in the reproduction cost of that company's property, at this time being placed at about $4,000,000. On this point the commission said:

> The commission does not consider it necessary nor advisable to enter into a discussion of these claims at this time. It is sufficient to say that the trial court has upheld the findings of the commission in the Potomac Electric Power Company's case in every particular; the Court of Appeals has reversed the lower court on two points only, on one of which the companies now rely for their arguments for an increased fair value; an appeal has been taken from the latter decision to the United States Supreme Court, which that court has allowed, and briefs and transcripts of the evidence are being prepared for presentation to that court. The commission will await the decision of that court before attempting to revise its findings of fair value.

Estimates for 1922 Considered

The commission in its finding then goes at considerable length into the estimates of the probable cost of operation for 1922, compares the rates of fare in effect in Washington with those charged in about seventy-five other cities, and concludes that "a reduction in the rate of fare is justified from the evidence in this case, and, after considering the effect on the revenues of the combined companies, reaches the conclusion that the token fare should be reduced from 7 cents to 6⅔ cents, the cash fare to remain unchanged and the present charge for intercompany transfers to continue."

Commission Requests Opposing Authorities in Rehearing Case

The California State Railroad Commission, with a view to examining again the principles governing rights of way lands and uniform mileage fares, has addressed a letter to city attorneys and special representatives of communities and organizations appearing in the case of the Pacific Electric Railway asking these parties to furnish briefs and citations on these subjects at the rehearing of the railway's case in Los Angeles on March 20, which was postponed from Feb. 24. The commission pointed out that while its recent rate and service decision regarding the Pacific Electric followed the law as it heretofore has been interpreted by the courts, it always stands ready to receive suggestions and hear arguments in support of other views.

The questions on which the commission specially asked for opposing authority were the consideration that should be given donated lands and bonuses and the fairness of allowing the same rate per miles on paying as on non-paying lines.

Authority of I. C. C. Over Intrastate Rates Upheld

Increased intrastate railroad rates put into effect in all States by the Interstate Commerce Commission during the last nine months were upheld by the United States Supreme Court on Feb. 27.

The court declared constitutional that part of the rate-making provisions of the Esch-Cummins law, which gave the Interstate Commerce Commission virtually complete control of the intrastate as well as interstate rates.

This provision of the law was attacked by forty-three States which claimed that their sovereign rights were invaded by the statute and that Congress had no authority to give the commission control over intrastate rates, but only over interstate matters.

The suit, the first legal attack against the Esch-Cummins Law to reach the Supreme Court, was brought by the Railroad Commission of Wisconsin against the Burlington Railroad to enjoin the charging of the higher rates.

The decision of the Supreme Court in this case is regarded as one of the most important that the Supreme Court has rendered in recent years. In brief, it means that the Commerce Commission has unlimited power to safeguard the revenues of interstate carriers from injurious action by state authorities through the fixing of local rates. It practically disposes of the issue of states' rights so far as the exercise of them may reduce railroad revenues below the level determined upon by the federal commission as reasonable.

New Legislation Pending

In previous decisions the Supreme Court had indicated that, while Congress undoubtedly had the power under the Constitution to pursue the protection of interstate commerce into the domain of the states if necessary, it had not exercised that power, except so far as direct discriminations in specific rates were concerned. In passing the transportation act, according to the theory of the railroads and the federal commission now upheld by the Supreme Court, the federal commission was given power not only to remove discriminations in specific rates, but also general discriminations against interstate commerce where only the question of the reasonableness or adequacy of the total revenue was concerned.

Legislation is pending in Congress, notably in the Capper bill, to amend the rate-making sections of the transportation act so as to restore jurisdiction over state rates to the state authorities, regardless of the effect upon the revenues of the carriers or the yield upon their property investment.

Increased Patronage Noted.—Electric railway patronage in Miami and Miami Beach (Fla.), for January, 1922, has increased 15 per cent over January, 1921, according to R. L. Ellis, manager of the Miami Beach Electric Company.

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Rumor Weekly Pass May Be Adopted

The Tacoma Railway & Power Company, Tacoma, Wash., is considering the installation of the weekly pass system on its lines, similar to that in use in Youngstown, Ohio. This is indicated by the fact that the company recently sent Richard T. Sullivan, its manager, to Youngstown, to investigate and report on the success of the plan in that city. No confirmation or denial of the plan has been made by the Tacoma officials. However, a resolution has been introduced in the City Council, asking the Department of Public Works to request the Tacoma Railway & Power Company to establish a weekly pass to cost $1, and to be good for an unlimited number of rides during the week. The resolution asks the department to do everything possible to get Tacoma fares down to franchise provisions. Mr. Sullivan is very likely conversant on conditions in Youngstown, being formerly general manager of the Mahoning & Shenango Railway & Light Company.

Another Small Company Gets By on Five Cents

Another small road has been able to get by on a 5-cent fare, during the trying war-time period. It was a terrible struggle, but the company has succeeded. The railway in question is the one at Hannibal, Mo., operated by the Hannibal Railway & Electric Company. Included in the system are 6.5 miles of track. The need of the company was great for increased revenue, and in its effort to preserve the full value of the service to the public the company in 1918 sought an advance in fares. After no end of delays the matter finally came before the Public Service Commission at a rehearing last December for determination. The railway, however, having struggled along in the meantime as best it could, withdrew its appeal for help, realizing that as the tendency everywhere was toward price recession, the stigma of seeking an advance in rates just at that time would attach to it, although it would be unfair to the company that this should be so.

The increase in fare sought in 1918 was from 5 cents to 6 cents, with a corresponding increase for half fares. After several months, the Public Service Commission, to which the appeal had been addressed, turned down the request. During the late summer of 1920 the commission sent its auditors and engineers to examine the plant. The final outcome was that in December, 1921, the commission granted a further hearing on the original request. During all of this time the company operated on a 5-cent fare. It is still doing so.

After looking at the matter from all angles the company decided to ask the commission to dismiss its request without prejudice. This the commission did. As stated before, the company was prompted to this action by the fact that it did not think it propitious to seek an increase in fares when prices generally were on the downward trend. Moreover, as the company had been able, by exercising the greatest economy, to struggle along after a fashion, it figured that the prospect which was ahead of an early return to normal conditions removed the need for insisting on relief. The record is all the more remarkable when it is considered that the company is still running two-man cars and that the equipment necessarily is not the most efficient available to companies whose means permit them to adopt all that is best in modern methods of equipment and engineering.

Transportation News Notes

Repeal One-Man Car Ordinance.—The ordinance prohibiting the use of one-man cars in Sacramento, Cal., was repealed recently by a plurality of approximately 500 votes.

Pay-Leave Plan Suggested.—Collection of fares as passengers leave the car instead of when they enter is suggested as a means of relieving congestion on the lines in Camden, N. J., of the Public Service Railway by the trolley schedules committee of the Camden Chamber of Commerce.

Council Rejects Plan.—The plan of the Tri-City Railway, Davenport, Iowa, to install a monthly ticket system has been rejected by the City Council. This scheme of increasing individual fares to 10 cents and offering 5-cent fares to the holders of monthly tickets was discussed in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 25.

Hearing Postponed.—The hearing on the 10-cent fare rate on the lines of the Grays Harbor Railway, Light & Power Company operating between Aberdeen and Hoquiam has been postponed until March 8. The hearing was set for March 1. Several weeks ago the 10-cent fare went into effect and has been the cause for considerable protest.

Planning to Expedite Ticket Sale.—The action of the Cincinnati (Ohio) Traction Company in discontinuing the sale of two tickets for 15 cents has brought forth protests from many citizens. Before the Street Railway Committee of the Chamber of Commerce, Walter A. Draper, vice-president of the traction company, presented data showing how the sale of tickets at the rate of two at a time impeded service. He said that the traction company was preparing plans whereby car tickets would be placed on sale in any store that may care to handle them.

One-Man Cars on Line to Lake.—One-man cars have been placed in service on the line of the Connecticut Company between Willimantic and Lake Coventry. After leaving Willimantic the route of this line runs for the most part along the public highway. Except in the summer, when the lake is popular as a resort, the service between the two places over the single track line is infrequent. The road is divided into two zones, one furnishing service over the main street of Willimantic as far as Perkins Corners and the other extending from Perkins Corners to the lake.

Rehearing Postponed.—On Feb. 20 the California State Railroad Commission postponed to March 20 the Pacific Electric Railway's rehearing of the Hollywood rate case, which was scheduled to take place before the State Railroad Commission in Los Angeles on Feb. 24, 25 and 27. The postponement was caused by the serious illness of Paul J. Ost, assistant engineer of the San Francisco Municipal Railway, who has been called to represent the Hollywood Chamber of Commerce. The rehearing was granted the Hollywood Board of Trade, which is fighting the increase of the local fare to 10 cents on the Pacific Electric Lines serving its territory.

Scranton Rezoned.—The Scranton, Montrose & Binghamton Railway, Scranton, Pa., in a decision of the Public Service Commission dated Aug. 16, 1921, is ordered to rearrange its zoning system. The boundary of the first zone had been placed by the company at a point three-quarters of a mile from the boundary line of the city, where the zone had previously ended. To enable patrons living within the second zone, and thus within the city, to ride into the center of the city for one fare of 7 cents, the commission ordered that the limit of the first zone be extended to the city line.

Double-Berthing Plan in Effect.—The Dallas (Tex.) Railway is now employing the double-berthing plan of loading street cars in the business district of Dallas, as a means of speeding up traffic. This has just been made possible by the passage by the City Commission of an ordinance authorizing such practice. The ordinance was passed on recommendation of the Dallas Safety Council and with the approval of the officials of the railway. New safety zones range in length from 90 ft. to 125 ft. from the property line of the intersecting street, and will permit the berthing at the same time of two cars for loading and discharging passengers.

May Operate Trackless Trolleys.—Several track'ess trolleys will be purchased by the International Railway Buffalo, N. Y., for operation on Bailey Avenue if the necessary franchise is secured from the municipal authorities. Residents in the Bailey Avenue section have approved of the offer of the traction company to operate trackless trolleys in that section instead of laying tracks in that newly developed residential district. The International Railway told residents of the section as represented in the Bailey-Kensington Business Men's Association that its financial condition is not such that it could go ahead with laying a double track line in Bailey Avenue until that section of the city is better developed.

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Personal Mention

Promotions on Cleveland Railway

R. W. Emerson Named General Manager —A. E. Duty His Assistant—A. L. Behner General Superintendent

Promotions for three employees of the Cleveland (Ohio) Railway have just been announced by John J. Stanley, president, as a result of the recent death of George L. Radcliffe, vice-president and general manager of the company.

Ralph W. Emerson is named general manager. Since September, 1915, Mr. Emerson has been assistant superintendent of the company.

Mr. Emerson's experience in the traction field has been varied and rather unusual. Graduating in 1906 from Case School of Applied Science as a mechanical and electrical engineer, he joined the engineering force of the Cleveland Railway immediately thereafter. In 1910 he resigned from the service of this company to install and operate a power plant of the New York & North Shore Traction Company at Roslyn, L. I., N. Y. When that road began operating he acted as general superintendent, continuing in that capacity until 1915, when he rejoined the Cleveland Railway. Mr. Emerson is thirty-seven years old.

A. E. Duty is advanced from the position of general superintendent of the Cleveland Railway to assistant general manager. Mr. Duty is sixty-nine years old. He has been actively connected with electric transportation in Cleveland for more than fifty years. For the past ten years he has been general superintendent of the Cleveland Railway. Word of his promotion was wired Mr. Duty at Pasadena, Cal., where he is spending the winter.

Arthur L. Behner is promoted to the position of general superintendent of the Cleveland Railway. He is known throughout the country in traction circles as "Al" Behner. Twenty years ago he entered the service of the company as a motorman. Later he was transferred to the Cleveland, Southwestern & Columbus Railway. For a number of years he was very active in the work of the Amalgamated Association of Street & Electric Railway Employees of America as one of the international vice-presidents. On Nov. 1, 1910, he was appointed superintendent of employment for the Cleveland Railway, and became assistant general superintendent on Feb. 1, 1912.

Paul Warwick Is Executive Secretary of Georgia Utility Committee

Paul Warwick, assistant director of public relations for the Georgia Railway & Power Company the past few months, became executive secretary during February of the Georgia Committee on Public Utility Information. Mr. Warwick has been well known in newspaper circles in the Southern states for several years, having been connected with the Atlanta *Constitution* before and since the war as an editorial and feature writer. He served in the overseas forces during the war with the Eighty-second Division.

The Georgia committee was organized only last year and Lincoln K. Starr, now director of public relations for the Georgia Railway & Power Company, served as its first secretary. The purpose of the committee is to keep the public informed on matters pertaining to the public utilities throughout the State and to build good will for these utilities by the dispensing of reliable and accurate information concerning them and their operation. Among the plans it proposes to carry out this year is an extensive newspaper advertising sampaign that is to serve an educational purpose in the building of public good will for the utilities of the State.

Mr. Warwick has been succeeded as assistant director of public relations of the Georgia company by John R. Marsh, who has been connected with the editorial department of the *Georgian* in Atlanta for more than two years.

W. H. Taylor Assistant Executive

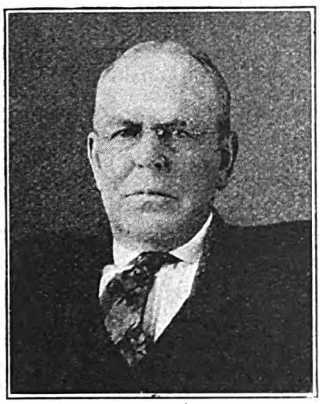
Appraisal and Rate Expert Joins Georgia Railway & Power Company

William H. Taylor, president for the past several years of the Omaha (Neb.) Gas Company, has joined the Georgia Railway & Power Company, Atlanta, as executive assistant to Preston S. Arkwright, president of the company, and Hugh M. Atkinson, chairman of the board of directors. He has become nationally known in public utility circles as an expert in appraisal and rate matters and in general consulting engineering work.

Mr. Taylor joined the Omaha Gas Company nine years ago as general manager of its properties, and seven years ago he became president of the company. Prior to that time he was with the United Gas Improvement Company, as engineer in charge of the gas and electrical properties on the main line out of Philadelphia. He had previously served with the Fulton County Gas & Electric Company Gloversville, N. Y., for a period of three years, where he also was engaged in engineering work.

MR. TAYLOR KNOWN NATIONALLY

While president of the Omaha Gas Company, Mr. Taylor served on various committees for the National American Gas Association, and was also representative of the association in the Iowa district. He was also president at one time of the Iowa District Gas Association. The bulk of his work the past few years has been in connection with rate cases before commissions and courts either as a witness or as a rate and appraisal expert. His duties with the Georgia company will be of a general nature in that he will act as the personal representative of the chairman of the board and the president.



A. E. DUTY

A. L. BEHNER

R. W. EMERSON

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Mr. Taylor was graduated from the Stevens Institute of Technology at Hoboken, N. J., as a mechanical engineer in 1902.

W. F. Bellinger and A. L. Smith Head New Departments of Georgia Railway

Following the resignation recently of G. A. Iler, superintendent of operation in the electrical department of the Georgia Railway & Power Company, Atlanta, F. L. Butler, general operating manager, has divided this work into two separate departments and announces the appointment of W. F. Bellinger and A. L. Smith to take charge.

Mr. Bellinger, who has been assistant superintendent of operation, becomes general superintendent in the electrical department to have supervision of the commercial trouble men, load dispatchers and operators of all the stations of the company near Atlanta, and all stations in other cities. Mr. Smith, who has been superintendent of the substation construction and steam heating division, is made superintendent of tests and repairs. He will continue in charge of the other division and will also have supervision of the repair and testing departments.

W. C. Smith Retires from Pennsylvania-Ohio Electric Company

W. C. Smith, for many years superintendent of the Newcastle District of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, and manager of Cascade Park, has resigned. He does not expect to go into any other work.

Mr. Smith has been active in the railway industry for forty-two years. He has watched it grow from a city transportation by horse cars to an interurban transportation by electricity. He drove a horse car, but he acted also as conductor, and traffic manager as well if anything obstructed the peaceful path of the car. From 1880 to 1883 he successfully conveyed passengers for the Citizens' Passenger Railway Company of Pittsburgh in what was then record-breaking time. In 1883 he became stable chief and superintendent of the East End Division, and in 1889 assistant superintendent of the Citizens' Traction Company.

His experience includes direction of cable cars, for during his service with this company cable cars were widely used. He climbed steadily higher, holding the post of general manager of the Central Traction Company, Centralia, Ill. Upon the consolidation of the Pittsburgh companies Mr. Smith was made superintendent of transportation. From 1901 to 1904 he was assistant manager and later general manager of the Mahoning Valley Street Railway, Youngstown, Ohio, but returned for three years to Pittsburgh. Since 1907 Mr. Smith has been with the Mahoning Valley & Shenango Railway & Light Company, Youngstown, as superintendent, with headquarters at Newcastle.

Guy C. Hecker Appointed Special Engineer

Guy C. Hecker, formerly general engineer for the Westinghouse Electric & Manufacturing Company, has been appointed special engineer in the headquarters office of the American Electric Railway Association, his duties to commence March 15. Mr. Hecker's duties will be principally those which were formerly performed by the present Executive Secretary, J. W. Welsh, when he held the position of special engineer. This office has been vacant since Mr. Welsh was made acting secretary at the time of Mr. Burritt's resignation. It is also expected that this will materially assist the engineering association in its work.

Mr. Hecker's connection with the electric railway industry dates from 1903 when he became connected with the Citizens' Traction Company of Pittsburgh. He was there until 1908 as wireman, and substation and power station operator. In 1908 he entered the electrical engineering course of the Carnegie Institute of Technology at Pittsburgh, working evenings as load dispatcher for the Pittsburgh Railways Company. He became load dispatcher on the regular force two years later About 1914 he was made chief electrician of the Pittsburgh Railways Company in charge of substation construction, operation and maintenance; he also had charge of electrical maintenance of power stations until power generation was transferred to the Duquesne Light Company.

G. C. HECKER

After spending, in 1919, a short time as the Pittsburgh representative of Whitman & Barnes Manufacturing Company and later in the year as district manager of the Bristol Company, he became in 1920 a general engineer of the Westinghouse company in the railway department. In this position he has spent a great deal of time in the analysis of railway properties to determine the economies which may be realized by the adoption of automatic substation control. It is from this position that Mr. Hecker has resigned to accept appointment to the American Electric Railway Association.

Mr. Hecker is thirty-four years old.

Dr. Philip A. Brennen, who has been connected with the legal department of the Brooklyn, (N. Y.) Rapid Transit Company, for fifteen years, has resigned from his position. He has been trial counsel for the company in many of its greatest cases, notably those arising out of the Malbone Street tunnel crash in 1917.

E. C. Crosby, who constructed the Springfield (Vt.) Electric Railway, has disposed of all his interests in that company. He has also retired from active management of the Massachusetts Consolidated Railways, Greenfield, but retains his connection with the company. A new company, the Springfield Terminal Railway, takes over the Springfield Electric Railway. He was associated in the construction of the lines of the latter.

Obituary

W. T. Bryan, formerly president of the Athens (Ga.) Street Railway, and one of the best known financiers in Georgia for several years, died recently.

George E. Morris, trial counsel for the Boston (Mass.) Elevated Railway, died Feb. 15, at his home in Milton, Mass. He was a member of the firm of McConnell, Pinanski & Morris.

John A. Weir, ex-president of the Brotherhood of Interborough Rapid Transit Company Employees, died in New York City, Feb. 3. He was formerly an agent on the Subway Division of the Interborough company. From the organization of the Brotherhood in 1916 Mr. Weir held the position of a leader, for his desire to promote the best interests of all employees led him to work constantly for them. He was first a delegate for the station men of the Subway Division, soon after becoming vice-president. This position he held from 1917 to 1918, when he was made president to succeed John A. Phelan. He was re-elected in 1919.

T. J. Evans, builder and operator of one of the first commercial electric railways, died at Hollywood, Cal., on Feb. 2. He was ninety-one years old. Mr. Evans planned, financed, and built the Council Bluffs Street Railway and the present electric railway bridge, which was first used in October, 1880. He organized and directed two construction corporations, the Omaha & Council Bluffs Railway & Bridge Company and the Council Bluffs Street Railway. One company built the bridge and the other built the railway. The figures published at the time showed the bridge cost approximately $450,000. Mr. Evans eventually devoted all his attention to promotion of public enterprises, building several electric lines in Illinois. He was an associate of Abraham Lincoln and Stephen A. Douglas in his early manhood when his father was a leader in Illinois politics.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Will Enter Market for Railroad Equipment

J. P. Ernster and A. W. Barker, directing managers of the Founders Organization, 325 Plymouth Bldg., Minneapolis, Minn., expect soon to be in the market for railroad equipment. The firm is connected with the Northern Bond & Investment Corporation and has practically completed the survey from Columbus, on the main line of the Northern Pacific Railroad in Stillwater County, Mont., in a general southwest direction into the New World Mining district at the northeast corner of the Yellowstone National Park. This railroad will be a standard gage, electrically operated. It taps rich coal, timber and mineral districts. It will be 83 miles long. Active construction work of the road, it is expected, will be started this spring. Engineers are now at work on bridge design to cross the Yellowstone River. The same organization plans the erection of an ore reduction plant in the Divide and New World Mining districts and power development in this district. All of the work is under the supervision of the firm.

Standardization Increases Material Salability

An instance in which standardized American overhead trolley wire and transmission line equipment was preferred to a German product is cited in *Commerce Reports* for Feb. 6. An order of material for Swiss use by an American firm showed that the American equipment was purchased in spite of the fact that a much lower figure was obtainable from German manufactured equipment. Investigation shows that the engineer in this case wanted a high class standardized material that could be relied upon not to change periodically and so render obsolete the parts and supplies needed for replacement.

Business Decline Continues

Continued declines in business and industrial activity marked the months of December and January, according to a report issued by the United States Department of Commerce. Pig iron production increased in December to 1,649,000 tons, which was 90 per cent more than the year's minimum point, in July, when 865,000 tons were produced. Sales of structural steel decreased practically 30 per cent in December, when 71,500 gross tons were purchased, but were still three times larger than in February, 1921.

The report notes as of great import that prices have been comparatively stable for the past six months. It predicts only gradual decreases from now on. Imports and exports increased slightly in December, according to the report. The Department of Commerce has also issued statistics on the average mill prices of lumber for the past six months, and the averages for 1919 and 1920, also preliminary figures for the year 1921.

I. C. C. Reports on 1921 Freight Traffic

Reports just received by the Interstate Commerce Commission show that during 1921 there was a falling off in the freight traffic of the country of approximately 23.3 per cent compared with the volume the previous year. The greatest decrease, the reports showed, was in the Eastern District, where the net ton miles for the past calendar year amounted to 172,394,000,000, a reduction of 55,906,000,000 or 24½ per cent compared with the year before. The Western District came next with a reduction of 22½ per cent, the net ton miles totaling 127,044,000,000, which was 36,910,000,000 below 1920. A falling off of 20.6 per cent was reported by the carriers in the Southern District, where the net ton miles totaled 44,729,000,000 in 1921 compared with 56,303,000,000 or a reduction of 11,574,000,000 net ton miles in 1920.

Electrification of Central Railway of Brazil

Announcement and call for tenders for the electrification of certain lines of the Central do Brazil Railway, the supply of traction and transport material, and material for construction of substations has been forwarded to the Bureau of Foreign and Domestic Commerce, Washington, D. C.

These specifications will be loaned to firms interested through the bureau's district offices. Inquiries should be sent to the Electrical Equipment Division, referring to file No. 877.

Boston Makes Budget

The Boston Elevated Railway's budget for 1922 will amount to at least $4,000,000. Of this sum $2,000,000 will represent replacement due to depreciation and $2,000,000 additional capital account.

$3,750,000 Electrification Contract Awarded

It is announced that the Metropolitan-Vickers Electrical Corporation, Manchester, has secured the first contract in connection with the electrification of the South African Railways. The value of the order is between £750,000 and £1,000,000. The section involved is the main line in Natal from Glencoe to Pietermaritzburg, a distance of about 120 miles. The country is mountainous and the mineral traffic on the railway is heavy. About 70 electric locomotives will be supplied, and they will haul heavier trains over the gradients than the steam locomotives have been able to do.

ELECTRIC RAILWAY MATERIAL PRICES—FEB. 28, 1922

Metals—New York

Copper, electrolytic, cents per lb	12.75
Lead, cents per lb	4.70
Nickel, cents per lb	41.00
Zinc, cents per lb	4.85
Tin, Straits, cents per lb	29.875
Aluminum, 98 to 99 per cent, cents per lb	19.00
Babbitt metal, warehouse, cents per lb.:	
Best grade	32.00
Commercial	16.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.60
Somerset mine run, Boston	1.87
Pittsburgh mine run, Pittsburgh	2.15
Franklin, Ill., screenings, Chicago	2.00
Central, Ill., screenings, Chicago	1.80
Kansas Screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$40.00
Standard open hearth rails, gross ton	$40.00
Railroad spikes, drive, Pittsburgh base, cents per lb	2.05
Tie plates (flat type), cents per lb	2.00
Angle bars, cents per lb	2.40
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.12½
Steel bars, cents per lb	1.37½
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	1.35

Hardware—Pittsburgh

Wire nails, cents per lb	2.40
Sheet iron, (24 gage), cents per lb	2.85
Sheet iron, galvanized, (24 gage), cents per lb	3.55
Galvanized barbed wire, cents per lb	3.05
Galvanized wire, ordinary, cents per lb	2.75

Waste—New York

Waste, wool, cents per lb	13.00
Waste, cotton, (100 lb. bale), cents per lb.:	
White	10.00
Colored	9.00

Paints, Putty and Glass—New York

Linseed oil, (5 bbl. lots), cents per gal	94.00
White lead, (100 lb. keg), cents per lb	12.25
Turpentine, (bbl. lots), cents per gal	88.00
Car window glass, (single strength), first three brackets, A quality, discount*	85.5%
Car window glass, (single strength), first three brackets, B quality, discount*	86.5%
Car window glass, (double strength, all sizes, A quality), discount*	85%
Putty, 5 lb. tins, cents per lb	5.50

*These prices are f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb	14.12½
Rubber-covered wire, cents per lb	6.00
Weatherproof wire base, cents per lb	15.50

Paving Materials

Paving stone, granite, 4 x 8 x 4, f.o.b. Chicago, dressed, per sq.yd	$3.35
Common, per sq.yd	3.00
Wood block paving 3½, 16 treatment, N. Y., per sq.yd	2.17
Paving brick, 3½ x 8½ x 4, N. Y. per 1,000 in carload lots	49.50
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.80
Cement, Chicago consumers net prices, without bags	1.94
Gravel, ¾-in., cu.yd., N. Y	1.75
Sand, cu.yd., N. Y	1.00

Old Metals—New York

Heavy copper, cents per lb	9.37½
Light copper, cents per lb	7.87½
Heavy brass, cents per lb	4.87½
Zinc, old scrap, cents per lb	2.37½
Yellow brass, cents per lb (heavy)	4.87½
Lead, heavy, cents per lb	3.62½
Steel car axles, Chicago, net ton	$13.25
Old car wheels, Chicago, gross ton	14.75
Rails (short), Chicago, gross ton	12.25
Rails (relaying), Chicago, gross ton	22.50
Machine turnings, Chicago, net ton	5.25

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Rolling Stock

Buffalo & Lake Erie Traction Company, Buffalo, N. Y., operating in the city of Erie has awarded a contract for the building of twenty-five new cars to the J. G. Brill Company for delivery some time during the month of May. They are of the one-man type. The cars are to be put in operation about June 1, according to present plans.

The United Electric Railways, Providence, R. I., will install one-man safety cars on one urban and seven suburban lines. These routes are Chalkstone-Elmwood Avenue, North Scituate, Chepochet, Warren and Bristol, Riverpoint-Rocky Point, Pawtucket-Cumberland, and Cranston cross-town. The company will buy new cars and also convert double truck cars for one-man operation.

Illinois Traction System, based on its experience in Quincy, Ill., and Wichita, Kan., has purchased Economy meters for the street railway systems in Peoria and Bloomington, Ill., and for the cars of the St. Louis Electric Terminal Railway, which operate over the McKinley Bridge between St. Louis and the Illinois suburbs of St. Louis. All of the meters used by the Illinois Traction System are equipped with the car inspection dials.

Track and Roadway

Wilkes-Barre (Pa.) Railway has been ordered by the Public Service Commission, in a decision dated Aug. 16, 1921, and just published, to reconstruct its track underneath the overhead bridge in the town of Duryea. The estimated cost is placed at $2,035. The order states that the work was to be completed by January of this year.

Grand Rapids (Mich.) Railway will install a trackless trolley extension on Bridge Street if the company is given a franchise by the city. The company's tracks will, in that event, also be extended on Kalamazoo Avenue from Franklin Street to the cemetery, on Division Avenue from Burton to Alger Street, and on College Avenue to the country club.

Miami Beach Electric Company, Miami, Fla., is now operating cars on West Flagler Street to a point beyond the Flagler Street bridge. Wires are being stretched to the end of the line in the northwest part of the city and cars are being operated on the line as the construction progresses. The Miami Beach Electric Company leases the Flagler Street line from the city.

Birmingham Railway, Light & Power Company Birmingham, Ala., is installing the necessary turnouts to allow the new routing which is now in progress. Extension of the Norwood line around the Norwood boulevard is expected to be completed very soon. Ties and rails have already been laid. It is stated that the wires will be strung in a short time. The extension is expected to be put in operation when the one-man cars are put on.

Power Houses, Shops and Buildings

Trenton & Mercer County Traction Corporation, Trenton, N. J., had its two-story brick garage badly damaged recently by fire. Two trucks were burned.

Lake Shore Electric Railway, Cleveland, Ohio is negotiating at Fremont with the owners of the Birchard building for the entire ground floor for use as a waiting room and ticket office. At present, the electric line occupies a part of the Wheeling & Lake Erie Railway station for office purposes.

Springfield (Mass.) Street Railway may have a new office building and waiting room for its patrons if the plan for the development of the bridge approaches submitted by Architect Cobb of the Improvement League is carried out. His suggestion is the building of a trolley terminal building on the vacant plot at the corner of Broadway and Vernon Street. This would help in the plan of the East-Side bridge approach.

Indiana Service Corporation, Fort Wayne, Ind., is rapidly completing the last link in a high-voltage circuit which will encircle three-quarters of the city and which will furnish electric power to the mammoth new truck plant of the International Harvester Company, on which construction work will start about the middle of March. The company, upon completion of the present last link, will have the city surrounded on three sides by a 33,000-volt system. It is planned to extend the present system back to the Spy Run power plant, thus completing the circuit.

Franchises

Dallas-Terrell (Tex.) Interurban, now being built from Dallas to Terrell, has asked the City Council of Terrell for a franchise within the city limits of that city for the operation of its cars. It is proposed to have the line enter the city from the west over the campus of the Texas Military College, thence down Grove Street to the Texas Midland Railway, where the interurban station will be located. Officials of the interurban company have asked for this route on account of the connection it will make with the Texas-Midland Railway, which officials of the interurban company declare, it is planned eventually to purchase from E. H. R. Green, its present owner. The plans of the interurban company call for the electrification of the Texas-Midland throughout its length and its operation as an interurban line from Paris on the north, via Greenville, Terrell, Kaufman to Ennis on the South. Extension of the Dallas-Terrell line to Tyler is also planned in the future.

Trade Notes

The F. Bissell Company, Toledo, Ohio. jobber of electrical supplies and power apparatus, and manufacturer of the Bissell electric suction cleaner, has recently moved from 226-230 Huron Street to its own building at 812-822 Lafayette Street.

Simmen Automatic Railway Signal Company, Eden, N. Y., has announced that Exum M. Haas, formerly manager of the railroad departments of the Austin Company and the H. K. Ferguson Company both of Cleveland, Ohio, and Western editor of the ELECTRIC RAILWAY JOURNAL from 1911 to 1916, has joined its organization in an executive capacity.

Roller-Smith Company, New York City, N. Y., announces the appointment of Pendleton E. Lehde, 609 Whitney Central Building, New Orleans, La., as a special representative in the State of Louisiana and the southern part of Mississippi. Mr. Lehde will handle the Roller-Smith Company's line of electrical instruments, electric meters and electric circuit breakers in that territory. By reason of his wide acquaintance and experience, Mr. Lehde is well equipped to handle the Roller-Smith Company's lines.

New Advertising Literature

Consolidated Car-Heating Company, Albany, N. Y., has just issued a new bulletin, No. 9-A, covering its line of resistances and fuse boxes designed particularly for use on electric railway cars.

The Ohio Brass Company, Mansfield, Ohio recently issued a pamphlet with a double page spread descriptive of its improved O-B Type C Splicer. The pamphlet describes the improvements made to give increased life and strength.

The General Welding & Equipment Company, Boston, Mass., has issued a descriptive pamphlet of the "GEWE" automatic cutting machines. This describes the equipment used for cutting steel plates and other parts by means of an automatically controlled gas torch.

The Cutter Company, Philadelphia, Pa., has issued a thirty-six-page booklet, describing in considerable detail various types of steel box mountings for its I-T-E circuit breakers. Various other details in regard to satisfactory mounting and use of these circuit breakers are also given.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is distributing two circular reprints relating to babbitt. One contains a discussion of the production of babbitt metal together with photographs of equipment used in its manufacture as well as the results of various tests of samples of alloys. The other reprint is a general discussion of the cost of lead base babbitt metal.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MacMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, March 11, 1922 — *Number* 10

"A Bond in Every Home"

MRS. FUNK, with her "Bond in Every Home" slogan, which she suggested at Indianapolis last week, has certainly hit pretty close to the mark in her answer to the public relations question. And she told how to do it too—sell to the women, the great sentiment makers of the country.

It was a happy arrangement of speakers at the mid-year dinner. Mr. Ainey, the commissioner, placed the responsibility for public utility operation on management, unhampered but advised by commissions, and pointed out that it was principally through the human factor that problems were solved; Mr. Insull, the owner and manager, placed his full reliance on good "public relations," and Mrs. Funk told how the fundamental desire of both could be obtained through the women.

Women, she said, are interested in the things of local interest—electric railway service, electric light and telephone service. This is, then, the great opportunity for electric railway men. This is particularly true just now as women are taking their place as voters and as women are more and more investing their own money and having a voice in the family's investments.

It was interesting to note the general nodding of heads and other indications of approval among the railway men at the dinner as Mrs. Funk drove these points home. Women are not to be neglected; in fact, if the women can be satisfied, electric railways will have solved "public relations."

Will this idea be capitalized? "A Bond in Every Home"—the women can help put them there!

Some Real Progress on the Overhead Crossing Specifications

THAT was a remarkable gathering of representative engineers which was held in New York City on March 2, under the auspices of the American Engineering Standards Committee, to consider the revision of existing overhead crossing specifications. And the result of the conference was even more remarkable, for a unanimous agreement was reached to co-operate in making such a revision.

Why was this a remarkable result? It was so because the particular subject under consideration was one regarding which there have been widely diverging views. The controversy has been going on for a dozen years. This was possibly the first time that so immediate and complete an agreement has been reached in a technical conference on so vital a subject.

Now, why all this hubbub in the matter of crossings of power lines over other things? Simply this: "The people whose property was to be crossed have wanted the overhead construction to be made ultra-safe. Those who were to do the crossing wanted to do the work cheaply. These points of view are necessarily conflicting; if allowed to control, they inevitably lead to deadlock. This is a consummation known in mathematics as *reductio ad absurdum*. But crossing must be made, and all that is needed is a reasonable factor of safety. The New York conference shows that a definition of "reasonable" is due to be reached soon.

The American Engineering Standards Committee provides a forum for the discussion of matters of this sort. It furnishes auspices under which conflicting interests can get together without sacrificing dignity. The result in this case augurs well for future co-operation.

Once Again "No Confiscation"

NO MATTER in what manner or on what point of law a case is brought before the Supreme Court in which a question of confiscation of private property, whether devoted to public use or not, must be determined, the court seems always to uphold the sacred principle of non-confiscation without due process of law. The latest example is the "80-cent gas case," the Consolidated Gas Company of New York being the particular company and the legal question being the constitutionality of the New York State law fixing the price of gas at 80 cents per 1,000 cu.ft.

In affirming the decision of the lower court the Supreme Court spoke in no uncertain terms; in fact, it spoke with much stronger language than is its wont.

While the details of the case are of interest, the one thing of importance to other branches of the public utility business is that this merely adds one more bit of evidence, one more piece of assurance, with reference to the legal and moral power to resist confiscation at the hands of uninformed or unprincipled public officials. A continued maintenance of this policy, which seems fully assured, is of course in the very best interests of service to the public. It is only with a feeling of such security that public utility operators can do anything worth while in developing the stability of their properties and in maintaining a satisfactory service.

Turning the Tables in Paving

IT IS not hard to prove to anybody and everybody that the indirect paving tax is a monstrous, obsolete injustice, but it is quite as impossible to get any one to bell the paving cat as it was to bell the original cat after the mice conclave of the famous fable. On the other hand, there is usually frank admission by automobile interests that the paving wear caused by rubber-tired vehicles is not fully compensated by taxation.

Is there no way of belling the paving cat other than stepping up to him frontwise? Yes, there seem to be several ways of sidling up to this terror-striking creature, and the weapon is the motor bus itself! Not long ago, as reported in these columns, a community confronted by the substitution of shuttle bus for direct railway service came to the sudden conclusion that it would rather see the rails renewed than taken away forever—so much rather, indeed, that it waived the paving charge then and there.

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Now comes another story. An engineer was addressing a group of the city's most influential men on the modernizing of the local transportation system. He dwelt upon the necessity of more cars for the better routes and of motor bus substitution for cars on the thinner but worn-out rail routes. At the close of the meeting one of the members stepped forward to say privately to the speaker that inasmuch as the city had appropriated but a limited amount for new paving it would be desirable to have advance information as to the exact route of the proposed bus services. Arrangement would then be made to spend the paving funds where they would be of most good to the new transit system! This was real co-operation, for no matter how the municipality might feel toward the elimination of the street railway paving tax, it had no power to amend what is practically a state contract. On the other hand, the fact that the local company was going to operate motor buses gives the city the opportunity to show its good will in a most substantial way, since good paving is the first essential toward economical and attractive motor-bus operation. But the moral? Two strings to a bow are better than one.

Better Materials and Better Methods Are Needed in the Shop

A WALK through the repair shop of an average railway gives an impression of inefficiency in spite of the small number of hard-working men present and the excellent shop system in force. There are apparently too many worn axles and wheels, too many broken or cracked pinions and gears, too many burned field coils or armatures. The railway operator has devoted long hours to his task in trying to keep going without any money, and the worker is liable to feel that he is working under some great handicap in regard to the materials furnished. One sometimes wonders if the manufacturer of railway materials has also been forced by economic conditions to curtail the research and study necessary to bring about desirable improvements in quality.

At quite frequent intervals in the columns of this paper articles on manufacturers' tests and inspection of railway material have been printed. In these an attempt has been made to demonstrate the great care that is exercised by them to insure the maintenance of a high standard of quality. The manufacturer is just as vitally interested in having his materials give good service as is the operator. He realizes that one of the essentials of sound business is to give satisfactory service, and this can only be accomplished if the highest grade of material enters into his product. To offset this fact, at the present time, without doubt, materials are subjected to more severe conditions than ordinarily. In fact the severity of electric railway operating conditions is continually increasing. The present conditions of heavy overload and deferred equipment and track maintenance add one more element of stress to the equipment parts.

There is one point that should not be lost sight of, however, namely, that the scrap heap is an excellent place to study weaknesses of material, and the equipment of electric railways at the present time is certainly in a condition to afford valuable data. The battle-scarred motors, axles, pinions, gears and truck frames will afford suggestions for improving the situation.

Every economy counts and if a better grade of steel, a better lubricant or method of lubrication, a better method for installing and maintaining gearing can be developed by the manufacturer in co-operation with the railway shops, then every encouragement should be given to research work of this character.

Real Reasons for Being Optimistic

PRESIDENT TODD is optimistic on the outlook for the future. Some there are who will say: "Well, he ought to appear to be even if he really isn't." But he is, and he has real reason to be. In so far as the so-called exigencies of the occasion would permit, Mr. Todd quoted a few statistics at the meeting at Indianapolis to prove that his attitude is properly taken. He looked at a cross-section of the industry for his enthusiasm. Along with most other companies Mr. Todd's own company has suffered in recent years. But he has not allowed that fact to dim his appreciation of the general change for the better that is taking place. The process of recovery for the industry is slow, but it is sure. The latest available association statistics prove it. Necessarily, these are some months old, but the facts they brought out are being substantiated in the annual reports for 1921, now being published. Individual managers here and there may have wished for better results, but the figures are distinctly encouraging.

Both Boston companies have turned in accounts for the year that show remarkable results. In Philadelphia Mr. Mitten hopes to go back to paying dividends after having earned $1,807,292 net in 1921. In Pittsburgh the receivers showed an increase in net of $1,073,046. In Columbus arrangements are being made to liquidate back dividends on preferred stocks by increasing that issue and returning to regular payments. In Louisville the showing is distinctly encouraging, although it may not be all that Mr. Barnes could have desired. In San Francisco the reorganized Market Street Railway has been placed on a dividend-paying basis. These are a few instances taken at random. In many places plans are being made to care for the deferred maintenance of the war-time period. Thus in Brooklyn $1,000,000 is to be spent in 1922 on track alone. In Boston the Elevated is planning to spend $4,000,000 the coming year.

It was a gruelling experience that the electric railways endured during the war time, but reviewed in the light of the frightful record of industrial companies all over the country during 1920 and 1921, the public utilities have certainly proved their claim to stability.

Concrete Evidence of a More Healthy Financial Condition

SIXTY-ONE of sixty-two electric railway companies in the Middle West which have purchased supplies from a certain manufacturer since Jan. 1 have paid cash within ten days of delivery and obtained the 2 per cent discount thereby. In addition to the indications mentioned above that the electric railways generally were getting on their feet, this nearly 100 per cent record of companies discounting their bills is indeed encouraging evidence of a healthy state of finances. It means that there is a widening margin between revenue and operating expenses, thus providing some surplus with which to work and making it possible to take advantage of such economies as the cash payment discounts. This concrete evidence of a general financial improvement of the industry is most reassuring to both railways and the manufacturers whose welfare is dependent on that of the railways.

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Nashville Traffic Survey Completed

City, State and Railway Join in Making a Comprehensive Study of the Vehicular and Passenger Traffic—Ross W. Harris Employed to Make the Report—He Used Methods Similar to Those Followed by Him in Memphis Survey

WHY is it that so many traction line managers do not seem to appreciate the value and importance of a highly developed schedule organization and close regulation of service? In Nashville the city, the state commission and the Nashville Railway & Light Company have recently co-operated in a survey of traffic on the railway, with the idea of better car routing to handle this traffic with a minimum of expense and delay. Some drastic rules will have to be made affecting the parking of automobiles in the business districts so as to enable the trolley car schedules to be materially increased. This survey was conducted by Ross W. Harris, consulting engineer, Madison, Wis. It is in two parts. In the first the objects sought and the recommendations made are outlined. The second part gives the results of the observations upon which the recommendations are based.

The report has been submitted to the city and the commission, but as yet no final action has been taken to accept the report as a guide nor to put the recommendations into practice. The methods suggested are similar to those which Mr. Harris recommended in his report on the Memphis situation and which have been adopted and put in effect by the receivers of the company, the city of Memphis and the state commission.

An abstract of the Nashville report follows:

INTRODUCTORY

The primary purpose of a street railway system is to transport passengers to and from their places of employment. It is to this business that the street railway must look for its most substantial form of revenue. In addition to the habitual car riders, there are certain passengers who demand railway service when the weather is good and others when it is bad. Still others are transient and have no resident connection to the territory served. Other elements of service might be termed "indirect." Under this heading come those elements that have a bearing on the social, industrial and commercial welfare of the city. The laboring people constitute the regular riders, and to them the street railway is a convenience and a necessity. These people constitute the backbone of the community and their convenience comes first when the question of service is considered.

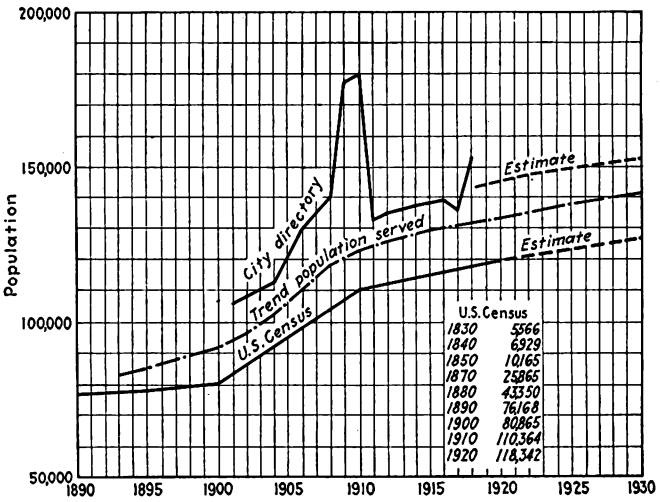
TABLE I—SHOWING PER CENT OF TOTAL AREA, POPULATION AND TRAFFIC CONTRIBUTED

By Half Mile Concentric Zones Centering at Public Square

Zone Number	Per Cent Total City Area	Per Cent Total City Population	Per Cent Total Traffic Contributed
1	4.29	4.99	46.92
2	12.85	19.53	11.00
3	19.79	30.85	11.32
4	23.43	24.18	11.67
5	16.70	10.48	7.06
6	11.33	4.14	3.61
7	5.37	2.11	2.61
8	3.36	2.03	3.24
9	2.28	1.18	0.77
10	0.60	0.51	1.39
11	....	....	0.05
12	....	....	0.02
Outside 12th	....	....	0.34
Total	100.00	100.00	100.00

The automobile has been developed to a remarkable degree during recent years and some have said that it would greatly impair the usefulness of the street railway. This theory has not been supported by experience, for, concurrent with the increase in the number of automobiles, street railways have expanded, and there is substantial evidence of their continued development. The street railway of today is more firmly imbedded in the life of the community than ever before.

Early in the history of street railways in Nashville the longest possible ride for a single fare was slightly more than 1.5 miles. Now it is slightly more than 14 miles. Thus with the increasing demand for urban transportation the increase in facilities for rendering service has been a substantial aid to the development of the city in a social, industrial and commercial way.



POPULATION OF NASHVILLE, PRESENT AND ESTIMATED

Street railway service is rendered in large units and thus serves transportation demands with greater ease and less congestion than can the automobile. Even if automobiles were economically possible, the capacity of the streets would be insufficient to accommodate the myriads of small units necessary to serve many thousands of passengers who demand service collectively in short periods of time. No method has ever been suggested and proved practical that is cheaper than trolley car operation.

The problem of transportation is not merely one for the street railway company alone. It should claim the serious attention and constructive co-operation of the public, car rider, operator and investor so that its future may be assured to the benefit of the community.

RESULTS SOUGHT

As a result of a six months study of traffic conditions in Nashville, recommendations are made in order that the following results may be obtained: (a) General improvement of street car service; (b) relief of congestion in the downtown district; (c) greater reliability of street car service; (d) increase of schedule speed of cars; (e) improvement of efficiency in the use of cars

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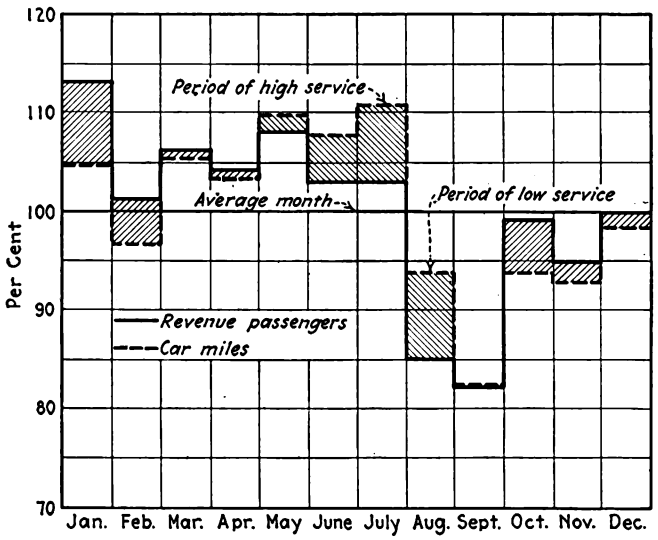
and a distribution more nearly in proportion to the volume and direction of traffic and its time of occurrence; (f) freer movement of traffic and better use of the carrying capacity of downtown streets; (g) further development of the central business district.

RECOMMENDATIONS

As a guide for distributing service, periodic checks of traffic on each route should be made during rush hours each week, not including Saturday, and at least once a month on Saturdays and Sundays by a permanent force of trained inspectors. From this



TRAFFIC AND CAR-MILES COMPARED WITH MONTHLY AVERAGE FOR YEAR

information there should be determined for each route, just prior to the beginning of each month, an equitable daily line standard that is seasoned with good judgment and policy and predicated on an equitable relation between fare, rate of cost, volume of business, physical conditions along each route and the immediate future business outlook. These standards should be a guide for determining the total car mileage to be operated for each route.

Every effort should be made to establish a system of flexible schedules that can be readily changed on short notice. Such schedules should be limited on one side by the readiness-to-serve element of service and on the other by an equitable relation of the elements of car service. The daily car mileage over that required for readiness-to-serve service should be distributed proportionately to traffic as to its volume, length of ride and time of riding. This traffic may be indicated by that observed at points of maximum loading in excess of that accommodated by cars in readiness-to-serve service.

Ordinances forbidding parking of automobiles on certain downtown streets should be passed immediately. Limitation of the time of parking is alone not sufficient owing to the increasing number of cars. The downtown parking privilege is an extravagant use of valuable roadway to the great disadvantage of moving vehicles, for which purpose street capacity is primarily intended. Left-hand turns should also be prohibited in the downtown districts.

The coupling up of lines which now enter the downtown district from opposite directions and have similar traffic characteristics into single through lines is not only desirable from the standpoint of service and economical operation but is necessary to avoid congestion that would result from looping all cars in the business district.

Many cars are now operated to the ends of the lines, while the average ride of the passengers is much shorter. This results in many vacant seat-miles and many standing passenger-miles.

The characteristics of street railway travel are such that seat-miles are always in excess of passenger-miles. Nevertheless the proper distribution of service will reduce this ratio to a minimum, consistent with reasonable, adequate and efficient service. The situation therefore justifies the turning back of cars, after readiness-to-serve service is taken care of and whenever physically possible, before they reach the terminal of many of the present routes.

In a small city a central transfer station is advantageous, but the station in Nashville today offers facilities which are inadequate for the traveling public. In other words, the city has outgrown the transfer station.

If the service-at-cost plan is instituted, it is implied that the public is entitled to all the service that a given fare will pay for. That is to say, the patrons of any line are entitled to all the service their patronage will pay for, considering the operating cost and the relation that their line bears to all other lines.

Any change in the present system of routing will make necessary changes in the operating routine followed by the company. Such adjustments are far reaching and can be brought about only by a gradual process. It is advisable that a system of rerouting be put into effect at the earliest practical date that will relieve the present excessive congestion and improve service without materially changing the relation of the system to the present business district.

Report on Traffic Conditions

LAYOUT OF CITY

The city of Nashville has a population of 118,342, residing in an area of 18.44 sq. miles. In addition, several thousand people live just outside the present city limits. The topography is irregular, there being many steep grades, ravines and streams. Many of these grades are in the downtown district where the congestion is greatest. Their presence emphasizes the necessity of safe operation.

The city centers approximately at the Court House and service must be rendered in four directions. The population is very dense in the immediate downtown section. The manufacturing district as well as the residential sections are widely distributed. The streets are narrow at points where the flow of traffic is greatest, and this offers a serious problem that must be solved. Otherwise it will remain a decided handicap to the future development of the city.

The population statistics are shown in the accompanying diagram. The trend of population for the next ten years has also been projected. This estimate is equivalent to an annual increase of 0.56 per cent each year for the next ten years. If the city should be divided up by concentric half-mile zones centering at the public square, 31 per cent of the population will be found in the third zone, or that between the mile and the 1½-mile circle. Ninety per cent of the population lives within 2½ miles of the center of the city. The population density for the whole city is 6,415. The most densely

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populated zone is No. 3, which has an area of 3.65 sq. miles and a population density of 10,000. The extent to which these zones contributed to the riding is shown in Table I.

Due to the many influences that have a bearing on the development of riding habit, such as the area of the city, the distribution of population, the relative location of the car rider from his point of employment, the quality of service rendered, the rate of fare, etc., it is very difficult to draw a comparison of the riding habit of one city with that of another, for the reason that the controlling factors are not effective alike in any two cities. There is a prevailing tendency, however, for the riding habit to increase as a city grows. This is evident from an analysis of the statistics for the past seventeen years. In 1903 the rides per capita in Nashville were 139, and in 1920 they were 255. It is estimated that in 1930 the figure will be 332.

VEHICULAR TRAFFIC—PARKING

A survey was made of automobiles parked on the streets in the downtown district between 2 p.m. and 5 p.m. on April 15, 1921. At 2 p.m. there were 1,668 parked vehicles, 36 per cent of which were on streets having car lines, and at 5 p.m. there were 1,372 parked vehicles, 40 per cent of which were on streets having car lines. If each automobile complied with the one-hour parking law there were 1,725 automobiles during this time entering or leaving parking spaces on streets with tracks, and twice that number (3,450) of chances of delays to vehicles and cars in these three hours.

Stop-watch observations indicate that about twenty-five seconds are required for an automobile to enter or leave its parking space. Applying this to the aggregate number of vehicles, it would require 1,438 minutes, or twenty-four hours, during the three-hour period to park these automobiles.

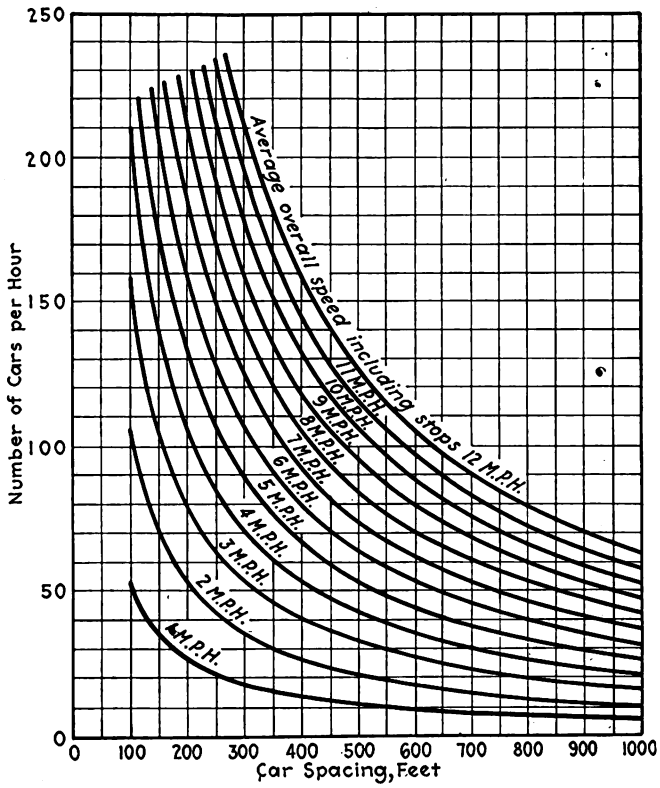
In cases where street cars had actually to stop or slow down on account of automobiles entering or leaving parking places the observed average duration of a street car stop was ten seconds, and an average loss of six seconds when a car was required to slow down. The total loss of time when a car comes to a full stop, including that due to drifting and accelerating under such conditions, is twenty seconds.

With these figures as a basis it is estimated that the delay on account of cars having to stop when passing through the downtown district on Church Street, Fourth and Third Avenues from 2 to 7 p.m. daily amounts to one hour and twenty-four minutes. Similar analysis shows that on account of cars having to slow down due to interruption they lose two hours and six minutes. This estimate does not include delay to street cars that is caused by the reduction of street area caused by parked automobiles.

During the evening rush hour the parked machines begin to move with greater frequency, and it is during this period that street car traffic is greatest. Thus the ill effects of parking become more serious. If the parking of automobiles was not permitted, particularly on streets having car lines, much more space would be available for moving vehicles and this would aid the free movement of the street cars. This would also result in improvement of the reliability of the street car service, increase in the speed of cars and greater economy in the cost of operating, thus making better service possible.

TABLE II—SHOWING TRAFFIC CONDITIONS IN DOWNTOWN SECTIONS

	Width of Street Curb to Curb (Feet)	Width of Car Zone (Feet)	Total Width Outside of Car Zone (Feet)	Normal Vehicular Street Capacity (15 Min. Period) Parking Allowed	No Parking	Observed Vehicles Max. 15 Min. Period
Third Avenue...	31.5	8.2 (S.T.)	23.3	0	349	126
Fourth Avenue..	31.5	8.2 (S.T.	23.3	0	349	103
Church Street...	33.2	17.8 (D.T.)	15.4	0	115	107
Eighth Avenue..	40.0	17.8 (D.T.)	22.2	0	166	94
Broadway.....	80.0	19.4 (D.T.)	60.6	357	454	188
Deaderick.....	55.2	18.3 (D.T.)	36.9	179	276	74



THEORETICAL TRACK CAPACITY, ONE TRACK IN ONE DIRECTION PER HOUR

CARRYING CAPACITY OF STREETS

A survey of the amount of street space available for moving vehicles on the downtown streets was made, with the idea that the railway strip should be entirely reserved for railway passengers. On 31-ft. streets, measured between the curbs, even with single tracks, it was found that when there was automobile parking the space remaining for vehicular traffic was not sufficient to permit cars to pass moving vehicles. The same was true of a 40-ft. street with double tracks.

With the elimination entirely of parking on such streets, the capacity would naturally be greatly increased, and if figured on the basis of one vehicle per foot width of roadway per minute, it would be many times what was actually observed.

An analysis of Table II will indicate that with parking prohibited the normal capacity of the street is far from being used, even with the track space reserved for the exclusive use of street cars. It follows that not only does the parking privilege deprive the moving vehicles of a large share of the use of the street but it also necessitates the use by automobiles of the space which should be given over to the car rider, particularly during rush hours. Further, the parking privilege, as it now prevails, seriously inconveniences the public at

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large by reducing the amount of carrying capacity available for the use of all street traffic. It must be apparent therefore that privileges accorded the parked automobile are a serious handicap to serving the public requirements properly and cause an inefficient use of valuable street capacity.

There is but one conclusion to be drawn from this analysis, and this is that there is need of more capacity for moving street traffic. Two major plans are available: The first involves street widening, thereby giving more space, but such a plan would involve an enormous expense and require extensive readjustments of the downtown district. For this reason its practicability is questionable. The second plan is to obtain additional street capacity by a more efficient use of the present street capacity. This can be accomplished in one of three ways. The car tracks may be removed entirely from certain streets. Second, automobile traffic may be removed entirely. Third, a combined restricted use of the streets by both automobiles and street car traffic can be brought about. This last plan will least inconvenience the public. The regulations regarding parking should be revised, and automobile traffic should be diverted from street car arteries by opening new routes and improving street paving on those streets. Rerouting street cars will also help.

TABLE III—COST OF SERVICE AND EXCESS SERVICE, 1920

	Per Cent of Average Month						
	Revenue Passenger Service		Excess Service Over Revenue Passengers	Car Miles Average Month	Excess Mileage	Operating Expense Exclusive of Taxes, Cents per Car-Mile	Cost of Excess Service
May	108.10	109.99	1.89	461,524	8,723	31.2339	$2,725
June	103.04	107.69	4.65	461,524	21,461	32.8584	7,052
July	103.02	110.73	7.71	461,524	35,584	32.8061	11,674
August	85.09	93.99	8.90	461,524	41,076	38.0215	15,618
Total					106,844		$37,069

These 106,844 miles if run in 1920, say July, would cost 32.8061 cents each, or a total of $35,037.

Cases have been noted where one automobile with one passenger has delayed three cars. Many cases have been noted where three or four automobiles have delayed ten or fifteen cars. The average automobile during the rush hours has two passengers, and a small number of people in automobiles can delay a large number riding on street cars. It is thus clear that, taken as a whole, automobile parking delays the movement of many thousands of people daily, and thus increases the cost of rendering street car service, which in turn argues for a higher rate of fare. These delays are most noticeable during rush hours when the maximum number of passengers are inconvenienced.

On Eighth Avenue between Church and Commerce Streets observation on April 21, 1921, showed that out of a total of 906 vehicles but 14 per cent were commercial cars and wagons, all the remainder being pleasure vehicles.

Cars are bulky and require a lot of space. They make frequent stops and at times are slow moving, whereas the automobile is a fast-moving conveyance, not large in size, and cannot render its best service and move freely without danger among the slow-moving street cars. This is especially true in narrow streets, and under such conditions the cars, moving slowly, limit the rapid transit possibilities of the automobile. In turn the car rider is inconvenienced by the great number of automobiles. Hence it is most desirable that certain streets be reserved principally for the use of street cars and others be used by the faster moving vehicles.

STANDARDS OF SERVICE

In a general sense, street railway service can be said to have two purposes. First, to transport passengers, and, second, to aid in the development of a community. There are also two ways of fixing the standard of service. The choice between these two depends on the answer to the question: Shall service be determined by the existing fare, or shall the fare be made adequate to meet the cost of the service demanded by the public?

Any service standard that does not take into consideration the constantly shifting relation between revenues and cost of service falls short of the purpose for which it is intended. In the past it has been quite common to attempt to establish a standard based upon an average load or number of seats per hundred passengers applied over a given period of time. These methods, however, have not proved successful for the reason that they are not conducive to efficient operation, neither do they guarantee an equitable relation between service, fare and cost.

A standard of service that is based upon the rate of fare, revenue, riding habit, cost of service and distribution of traffic demand in such a way as to maintain an equitable relation between revenues and cost should be developed somewhat as follows: Make an estimate of future revenue for several months, preferably a year, and from this deduct first an amount to maintain the integrity of money invested; that is, a sum sufficient to cover returns, renewals and replacements, maintenance and a small marginal profit and loss. The balance, after an amount is deducted to cover taxes, comprises all the money available for service.

BASING MILEAGE ON MONEY AVAILABLE

The next step is to determine the aggregate mileage that this amount of money will pay for at the prevailing rate of cost, then distribute it to the various months according to seasonal conditions and requirements. The amount of aggregate service thus allocated to the months may next be allotted to each of the various routes, and this in turn distributed to weekdays, Saturdays and Sundays, according to the conditions and requirements of each route.

TABLE IV—TOTAL SEATING CAPACITY OF CARS IN VARIOUS CITIES

	Date	Amount	Density Population per Square Mile	Area Served, Square Miles	Total Seating Capacity Per 1,000 Population	Total Seating Capacity Per 1,000 Revenue Passengers
Nashville...	1921	134,000	7,267*	18.44	52.8209†	0.207‡
Memphis...	1920	185,000	7,520*	24.6	55.946†	0.217‡
Minneapolis	1907	276,000	5,208	53.00	60.935	0.249
Detroit.....	1906	367,000	10,295	35.65	71.531	0.267
Milwaukee.	1904	307,000	13,644	22.50	37.817	0.211
Columbus..	1911	187,674	9,268	20.25	70.116	0.240
Indianapolis	1906	206,000	7,043	29.25	56.898	0.232
Toledo.....	1914	184,126	6,461	28.50	64.505	0.266
Kansas City	1904	239,000	9,192	26.00	75,372	0.269
St. Paul....	1907	204,000	3,676	55.50	35.382	0.169

* Includes trend population outside city limits. Density city only 6,602 in Memphis and 6,415 in Nashville.
† Closed equipment only.
‡ 1919 revenue passengers in Memphis and 1920 in Nashville.

Having thus distributed the service, a line standard can be formulated in the form of earnings per car mile for each route for each month of the year on a weekday, Saturday and Sunday basis. By such procedure all the underlying factors relating to fare, cost, traffic demand, etc., are centralized in the unit "earnings per car-mile." Then, reports of earnings and service for each of the

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routes furnish a basis for determining the current earnings of any line, and by a simple division of this amount by the unit "earnings per car-mile" the largest amount of mileage that should be operated on a given date will be indicated.

With the amount of mileage fixed for each line on a given day thus determined, the next problem is to distribute it along the line and throughout the day. This is a matter of schedule design. To do this deduct from the daily mileage justified by earnings the mileage

TABLE V—MINIMUM TIME SPACING

	Church Street, All Points, Seconds	Church Street Between 4th and 5th, Seconds	Church Street Between 5th and 6th, Seconds	Church Street Between 7th and 8th, Seconds
1. On account of car ahead: service stop..	25.000	25.000	25.000	25.000
2. On account of car behind: safety requirements:				
a. Personal element of motorman (decision to act)	3.000	3.000	3.000	3.000
b. Retardation (half time required for)	1.810	1.035	1.165	1.915
c. Acceleration (half time required for)	1.810	1.035	1.165	1.915
d. Time required to run 5 ft. at initial speed	0.629	1.099	0.977	0.593
Total minimum time spacing	32.249	31.169	31.307	32.423
Use – Seconds	32	31	31	32
Distance spacing – feet (initial speed x seconds)	173	96	108	184
Initial speed, m.p.h.	5.42	3.10	3.50	5.75
Initial speed, feet per second	7.95	4.55	5.13	8.43
Rate of acceleration and retardation m.p.h. per second	1.50	1.50	1.50	1.50
Seconds to accelerate or stop car	3.62	2.07	2.33	3.83

required on each route to maintain the "readiness-to-serve" element of service, and the balance may then be distributed along the line in a manner somewhat proportional to the length of ride and the distribution of the number of passengers passing the point of maximum loading over and above the number of seats scheduled to pass the point of maximum loading in the "readiness-to-serve" service.

The application of an equitable service standard, as outlined above, requires an efficient schedule department, the duties of which are to collect regularly and systematically observations of traffic requirements at the point of maximum loading and to design schedules in accordance with the standard of service. Difficulties that may accrue when schedules are changed may be overcome by the construction of fabricated schedules, built up in such a manner that each part, in effect, is a schedule complete in every detail but of such nature that each part may be changed without reference to any other part yet still gear in with all other parts forming the complete schedule.

Only the Method of Fixing a Service Standard Can Be Permanent

An equitable working standard of itself cannot be permanent for the reason that any one or more of the factors that govern it may and do vary in value and degree of effectiveness. The method of determining a service standard and distributing service, as outlined, requires constant supervision and adjustment on account of variation in the cost of service, changes in the price of materials and labor, the variation of traffic demand, etc. This means that each route will have a standard "earnings per car-mile" which may differ in amount from other routes for the reason that the traffic characteristics will vary the distribution of the available mileage. Likewise each month may have different requirements, and this, together with the possibility of changing rates of cost of service, makes it advisable that the line standards be determined just prior to the beginning of the month for which they are intended. Such a procedure, it is believed, will distribute service equitably and give to the public all the service a given fare will permit, and to the company assurance that the integrity of its investment will be protected, all of which lends itself to furthering the development of the community.

Whatever service will result from such a procedure must be such as to encourage riding and meet a test by the public as to whether it is satisfactory. Should such service be demonstrated to discourage riding and be unsatisfactory to the public, the rate of fare must be raised immediately a sufficient amount to permit service at cost that will meet requirements.

Limit of Loads

Subject to the limitation of service the loads carried past the maximum loading point over a twenty-minute period should not exceed regularly the normal capacity of the car, *i.e.*, the seating capacity plus one standing passenger for each 3 sq.ft. of standing area. Further, no regularly occurring maximum load should exceed the emergency capacity of the car, which is the seating capacity plus one passenger for each 2 sq.ft. of available standing area.

When two or more types of cars are operated on the same route the capacity of all types involved should govern the average load, but in the case of regularly occurring maximum loads the emergency capacity of the type of car involved should govern.

Recent changes in the economic conditions of the country have been far reaching and have brought about marked decreases in the purchasing power of the dollar and increase in the cost of labor and material. In many lines of industry increases in the prices of commodity have kept pace with the general trend of economic conditions. This is not true in the street railway industry, where materials and wages have increased by large margins without corresponding increases in the rate of fare.

The car rider usually rides at least once every day. This brings to his attention, through his pocketbook, any real or fancied grievances against the transportation system. The car rider has been inclined to view with disfavor any fare increase. In fact, rather than permit an increase he has been content with a lower standard of service. The standard of service now acceptable would not have been satisfactory before the recent change in economic conditions. Thus, the standards of today must be such as will harmonize with a public conception of service much different from that which existed a few years ago.

Control of Service

The demand for service is not at all constant. Variations frequently occur without warning, sometimes by long swings, and frequently by peaks. Superimposed on the increase due to increase of population there may occur seasonal, industrial, weekly or even daily fluctuations. The cost of service must be counter-balanced by revenue originating from traffic demand, as a matter of equity, and outside of the mileage required for the "readiness-to-serve" element of service.

Any lag in putting into effect reduced service after a decline of traffic is a needless expense, and similarly any lag in properly increasing service with an increased

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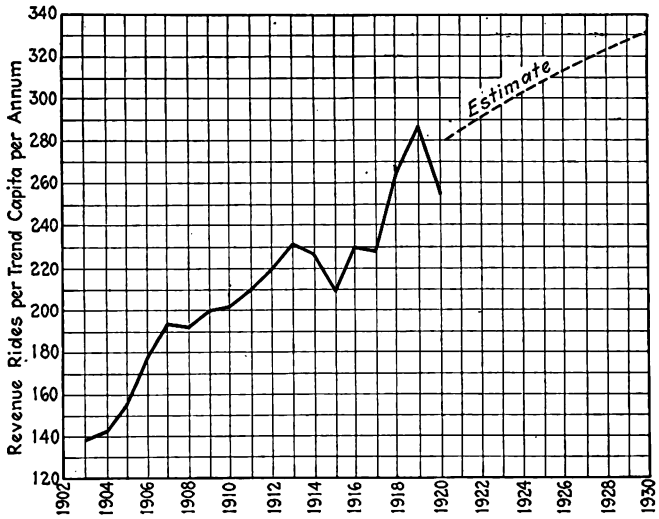
demand is to withhold from the public justifiable service. Much money may be needlessly expended if service does not closely follow the demand for it in an equitable relation. Reference may be made to the diagram on page 396 that illustrates the relative variations of traffic and service on a comparable basis where each month is expressed in a percentage corresponding to the average month for the year under consideration.

To all practical purposes the percentage of service should follow that of traffic, as this is most conducive of equity. With this in mind, the exact service operated and estimated expenses incurred are shown for 1920 in Table III. In all probability the variation of mileage involved in this table is due to short-hour cars. A car that operates twenty hours per day may cost $2 per



RIDING HABIT IN NASHVILLE, PAST AND ESTIMATED

car per hour, while one that operates but two hours per day will cost a great deal more, possibly as much as $8 per car hour. Without making a careful analysis of the service cost for short and long-hour car operation it has been taken as reasonable that a car-mile of a short-hour car will cost three times as much as the cost of the average car-mile for the entire system.

CHARACTERISTICS OF TRAFFIC NECESSITATES SHORT-ROUTING OF CARS

Seldom will a car be loaded to its full capacity through an entire trip. Few passengers ride from one end of a route to the other, and one seat will often accommodate more than one passenger, on a complete trip. Analysis has shown that each route from the center of the city to the outlying districts in Nashville has three distinct zones, a central, a transmission or neutral, and an outer zone. The central zone is located in the business district. The neutral zone, which is just beyond the central zone, contributes less revenue than the other zones, as fewer passengers board the cars there, but in this zone there are usually more passengers riding than seats. It is in this zone that the cars experience their greatest instantaneous load. The outer zone, which is beyond the neutral zone, lies chiefly in the residential district, and here are found the greatest number of vacant seats. The rate at which passengers leave and board the cars depends on the local characteristics of each route, but in any event the load on a car making an outbound trip decreases soon after the neutral zone is left to such an extent that seats become vacant. On a percentage basis, the outer zone furnishes 91.22 per cent of the traffic, the neutral zone 6.42 per cent and the central zone but 2.36 per cent.

An analysis of the data relating to standing passengers and vacant seats shows that there are 5,920 standing passenger-miles, found largely in the neutral zone, and 19,340 vacant seat-miles, chiefly in the outlying zones. In other words, there are 3.27 vacant seat-miles for each standing passenger-mile. A similar survey in the city of Minneapolis in 1912, at a time when the service was considered good, indicated 2.44 vacant seat-miles for each standing passenger-mile. If a comparison is made with these figures, Nashville operates 34 per cent more vacant seat-miles for each standing passenger than Minneapolis, where short-routing of cars is used extensively. In a similar survey made in Memphis, where short-routing was not extensively used and where at the time of the survey service was not considered good, there were 3.57 vacant seat-miles for each standing passenger-mile. In Memphis short-routing of cars will be used more extensively in the future with service distributed more nearly in accordance with "when, where and to the extent" of traffic demand, thus resulting in less vacant seat-miles and better service.

It has been found that the distance that each passenger will ride approximates one-half of the average distance that each car travels when making a one-way trip. The average length of ride in Nashville was determined by observation of all day traffic to be 1.91 miles. A passenger who transferred was considered as having one ride on each line used.

The seating capacity of cars ranges from thirty-two to fifty and averages thirty-nine seats. Excluding open cars that average forty-two seats the average is thirty-eight seats per car.

A series of counts has been made of passengers standing in different sections of the car while in service, and the amount of standing area has been accurately determined by measurements. It has been found that passengers will arrange themselves when standing as follows:

Place	Observed Average Standing Area
Front vestibule, one passenger for each	4.17 sq.ft.
Front aisle, one passenger for each	4.19 sq.ft.
Center aisle, one passenger for each	3.17 sq.ft.
Rear aisle, one passenger for each	3.50 sq.ft.
Rear vestibule, one passenger for each	4.11 sq.ft.
Car as a whole, one passenger for each	3.66 sq.ft.

Guided by these figures, which represent the general run of conditions, 3.5 sq.ft. per passenger has been adopted for use in computing the normal standing capacity of cars. It can be said, therefore, that the closed cars will accommodate on the average twenty-five standing passengers, which is 65 per cent of their average seating capacity. In emergencies, however, standing passengers will voluntarily arrange themselves to occupy much less space. The results of an observation as to the minimum standing space required for passengers is given in the following table:

Place	Observed Minimum Standing Area
Front vestibule, one passenger to each	1.02 sq.ft.
Front aisle, one passenger to each	1.28 sq.ft.
Center aisle, one passenger to each	1.24 sq.ft.
Rear aisle, one passenger to each	1.13 sq.ft.
Rear vestibule, one passenger to each	1.05 sq.ft.
Car as a whole, one passenger to each	1.62 sq.ft.

On the basis of these results the emergency capacity for standing passengers is computed on the basis of 2 sq.ft. per passenger. Table IV gives a comparison

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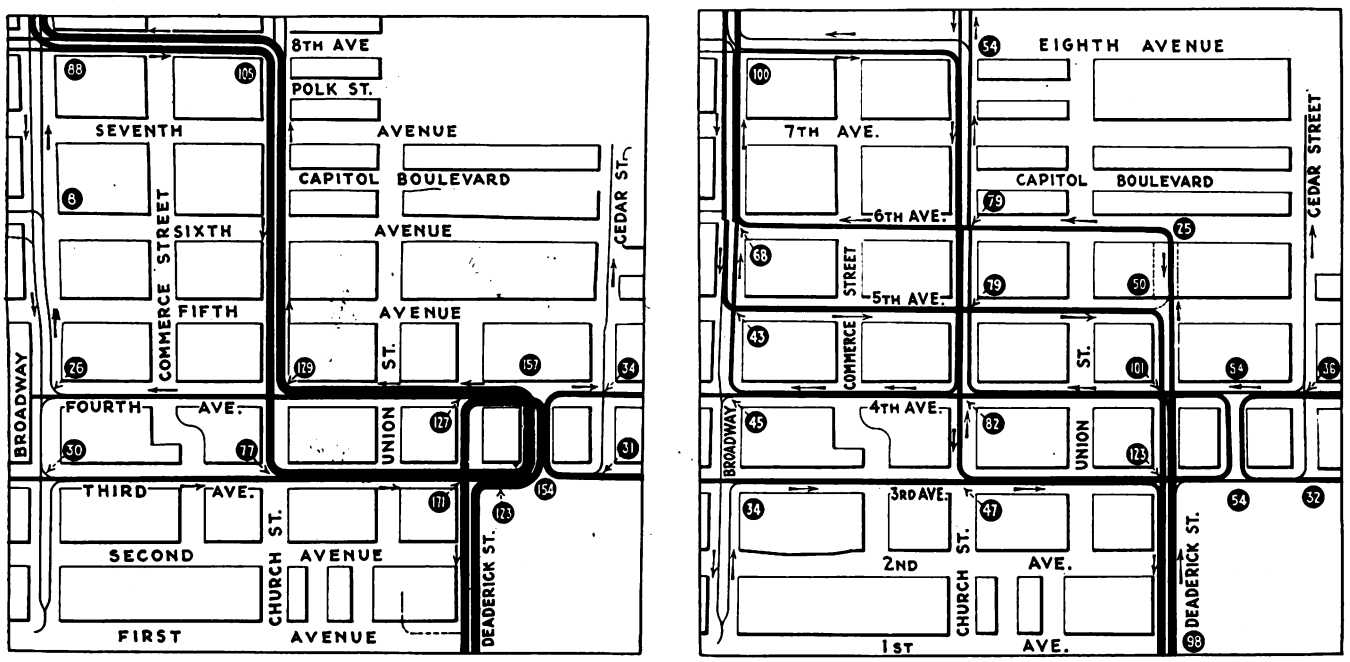
of the total seating capacity available for Nashville with that of other cities. This indicates that Nashville has proportionately the same amount of equipment capacity, but it does not follow that Nashville has too little or too much capacity, for the local standard of service is the controlling factor.

Track Capacity

The capacity of track is measured by the number of cars that can be moved over it in one direction during a specified time. This number will depend largely upon local conditions. Under ordinary rush-hour traffic conditions good service and economic operations demand the greatest number of cars per hour be such that any



Maps of Downtown Section in Nashville Showing Former and Proposed Routing of Cars

one car will not interfere with the free, safe and rapid movement of any other car.

Track capacity can be defined as follows:

1. Maximum track capacity is the greatest rate expressed in cars per hour at which cars may be operated over one track in one direction without any special consideration for speed, movement of cars or quality of service. If such conditions were to prevail for any considerable length of time good service could not be maintained.

2. Normal track capacity is the greatest rate in cars per hour at which cars may be operated, conducive of free movement, safe operation and reliable service. Under such average conditions good service is possible, although there would not be track capacity to care for much increase of traffic and continued good service.

3. Normal rerouting track capacity is that rate expressed in cars per hour adopted as a standard in questions involving the rerouting of cars, having in mind not only those factors involving good service but also the providing of sufficient track capacity over and above present requirements to provide for the accommodation of future increased service requirements.

If good service is to be maintained cars must move freely. Interference with the free movement of cars by vehicles and other cars must be avoided wherever possible. In Nashville in the downtown district all cars stop at regular points for receiving passengers, and on this basis free movement of cars implies that the time spacing between them should not be less than the average length of service stop, plus the time required for the next following car to make a full safety stop of short duration, from initial speed. If there is less time spacing than this, speed, free movement, service reliability or track capacity, or any two or more of them, may be sacrificed, thereby increasing the cost of service and reducing its quality.

On a basis that all cars in the downtown district make all regular stops, the minimum time-spacing between cars should not be less than the time required for the service stop, plus the time for the next following car to make a safety stop (which includes the time lost while it is coming to a full stop and accelerates to initial speed), plus the time required for the car to run at initial speed, a distance equal to that required between cars when stopped, in service, on the main line track. Table V shows certain minimum spacings figured out on this basis.

Speed of Cars Between Stops

The average speed between stops varies somewhat with direction, time of day and location. On Church Street during the evening rush hour the average outbound speed was 4.92 m.p.h., the highest speed was 10.77 m.p.h., the slowest speed was 0.97 m.p.h. and the slowest half-hour average speed noticed for one direction was 3.1 m.p.h. Average half-hour speeds at these times range generally from 3.5 to less than 6 m.p.h., and seldom exceed 6 m.p.h., while in places it is close to 3.1 m.p.h. At such speed cars will be passing a given point in one direction at a rate of about sixty per hour. A comparison between Nashville and Memphis in this particular is of interest. Memphis has an average speed of over 10 m.p.h. with cars passing at the rate of 150 per hour. Complaint has been made that the service in Memphis is poor, but if this is so with this average speed and number of cars per hour, what should be said of the service in Nashville, where the speed is one-third and the car passage almost one-third that in Memphis.

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In any consideration of the above it should be borne in mind that the speeds given are maximum speeds obtained between stops and not over-all speeds including stops, which are much less.

Length of Service Stops

During rush hours, that is from 5 to 5:30 p.m., the average stop is 18.27 seconds. Of the service stops observed 33 per cent were longer than twenty seconds, and the major portion of such observations were less than thirty-five seconds. However, an occasional stop was observed to be as long as forty seconds, but rarely sixty seconds. Eighty per cent of all service stops noted during rush hours did not require more than twenty-five seconds.

During non-rush conditions even a greater portion of stops observed required less than twenty-five seconds. Since rush hour conditions are the more severe, they must be given primary weight in the matter of track capacity, and, having in mind the factor of service reliability, twenty-five seconds is set as the proper duration of a service stop to be used in connection with the determination of normal track capacity.

Normal Capacity of Track

At least 5 ft. of free space is considered advisable between cars when stopped and standing on a main line track, as in a blockade. This practice varies somewhat between companies, for some use only enough space to permit one pedestrian to pass between the cars while others allow considerably more.

Many factors influence the number of cars that may be operated on a given track in one direction. If the space on the tracks between consecutive cars is used by vehicles, then the extent to which the full theoretical track capacity may be utilized is materially affected. Hence, when arriving at a particular figure to be used as track capacity the question of practicability in its relation to influences other than those having their source with street cars must be considered.

On Church Street between Fourth and Fifth Avenues, if cars move freely, they might be spaced as close as 135 ft. apart and run at the observed average maximum rush-hour speed between stops of 3.1 m.p.h. However, cars were found to be spaced on an average of 230 ft. apart, or 95 ft. more than required as a minimum safe distance spacing. To this extent the theoretical track capacity at a speed of 3.1 m.p.h. is denied to the car rider, due largely, if not entirely, to vehicular traffic.

Improved Methods for Regulating Vehicular Traffic Necessary

The automobile today is practically the exclusive user of the street outside of the street car. The street car is confined to a certain part of the street, while the automobile is adaptable to more varying conditions. Street capacity, particularly on the narrow downtown streets in Nashville, where low speeds are noted, are used very extensively by parked automobiles, and because of the narrow streets the only space left for moving vehicles is on the street car track interspaced among the street cars. In such cases the street car must then proceed, limited in its movement, by conditions as to the vehicular traffic. The solution as to increased speed involves an adjustment of parking privileges and regulations as to the movement of vehicles. The good of the public, and particularly the interest of the car riders, demands an early adjustment of methods of regulating vehicular traffic.

Artistic Fare Tokens Command Premium

Besides Solving the Change Problem These Fare Tokens Are Much Sought After By Tourists and Collectors as Souvenirs

By Dipl.-Ing. K. Sieber
Manager of the Nüremberg & Fürth Street Railway, Nüremberg, Germany

In proportion to the decline of the value of money in Germany during the last few years, an increasing want has been felt for small coins for change. First, the gold and silver coins disappeared; then, the copper and nickel coins went, too. Even the supply of iron coins which followed could not be maintained by the

Group of Fare Tokens in Nüremberg. The Reverse Side Bears the Name of the Company and the Words "20 Pfennig"

federal mints. Cities were then authorized to issue paper fractional currency for change. This helped some, but did not relieve the situation fully. The amount of the money thus issued, especially the metal money, was not sufficient, and much of it was retained by collectors, and found its way even beyond the boundaries of Germany. The paper currency, issued for small denominations, such as 10 and 25 pfennigs, proved inconvenient to handle. Moreover, it soon became damaged beyond use.

The street railway companies in Germany constantly urged their patrons to have the correct fare always ready, but the constant scarcity of change made it impossible for them to conform with this request. This reduced the fare receipts considerably, as the conductors could not make change in many cases. This trouble gave several street railway companies the idea that they might issue their own metal money, a plan which turned out quite well.

In Nüremberg, too, the lack of small coins for change was felt. At first the idea of a coin or token to represent "a fare" was considered, but it was rejected because of the large initial cost of coining such a token, and the fact that the frequency with which fares are apt to change made the life of any token rather short. In the spring of 1921 it was decided to reduce the cost of these coins by using their reverse side for advertising purposes. We had already orders for these "ads," but had to abandon the idea on account of the unstable financial conditions at that time.

In the meantime the lack of small change became more and more acute, and in April, 1921, it was decided

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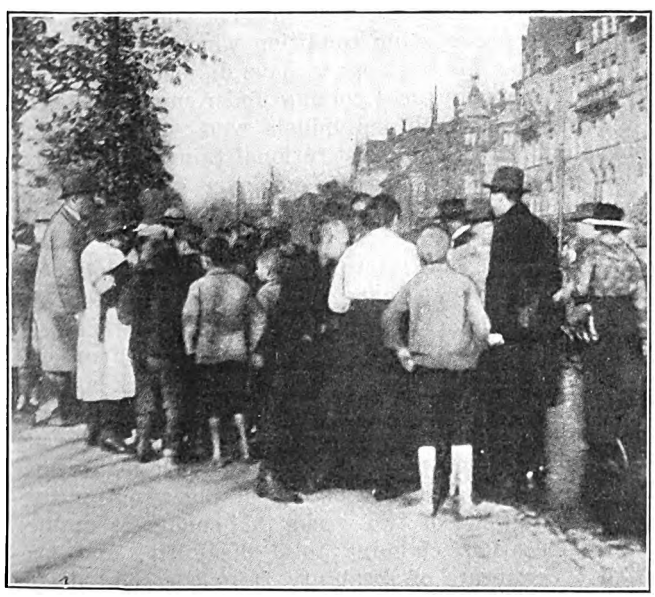
to issue octagonal aluminum coins of 20 pfennig denomination, on the reverse side of which would appear interesting views of Nüremberg and Fürth, such as of the memorial statues, fountains, busts of famous artists, etc. These coins were to be used as change and were given for such by the conductors upon presentation of a note of high denomination. The fares were then 60, 80 and 100 pfennigs for rides of respectively 3, 6 and more than 6 km. The coins were valid as currency only of course for street car travel. They were legal tenders to no one else, but we had the right to refuse a ride if the passenger could not present the exact legal fare.

At first the public accepted the new coins with interest but without enthusiasm. The coins came partly back to us, but their use became current also, against our intentions, in retail business transactions throughout the city, though some merchants refused to accept them in payment of goods or for change.

The first issue was 50,000 of each kind. Then the design on the reverse side was changed. Some of these coins turned out to be very attractive and popular in design, and this fact awakened the interest of collectors. Tourists, passing through Nüremberg, liked to take along a "set" of these coins as a souvenir, so that the demand for them increased at such a rate that the manufacturers of the coins, who were undergoing a metal shortage, could not keep up with the demand.

Soon a regular exchange value of these coins was established. It is said that some of them sold at a premium of 2,000 per cent or more. At some of the principal street corners, on racetracks and at other sporting places temporary exchanges were established for the purchase and exchange of the street railway emergency money. For every kind of coin a special value was established, according to the rarity of that particular coin. Newspapers published poems and short stories dealing with the emergency money, and witty songs were sung on the vaudeville stage to announce the issue of new pictures on coins.



OPEN-AIR EXCHANGE FOR THE PURCHASE AND SALE OF RARE FARE TOKENS

Suddenly the street car conductor became the most popular man in town. Unfortunately, it took but a few minutes for him to be sold out. He was, of course, permitted only to sell the emergency money at par value. Most of the conductors used the coins to secure for themselves a large amount of change money. They gave, for example, one mark in coins and nine marks in paper money in return for ten marks in change.

Various manufacturers became interested and made up and sold rapidly neat holders for this emergency money. Bracelets and other adornments were made out of the coins.

All told, forty-five different types of token were issued. What is of greatest importance, however, was that the number of travelers on the street railway increased considerably. Many a passenger took a ride on the street railway with the tacit hope of getting one of the rare emergency coins. Otherwise he would have walked. A further value of the tokens lies in the fact that they advertise Nüremberg. Its beauty is carried by them to all parts of the world. Not only were beautiful views of the city circulated in this way, but people were made familiar with the names of such famous men as Albrecht Dürer, Hans Sachs, Peter Vischer, Wenzel Jamnitzer, et al. As a last, and maybe not the least, advantage may be mentioned that in the minds of the populace was awakened an interest in their own country and their own famous past. The school board, in particular, reported that the pupils were greatly helped in learning about the history of the famous men of Nüremberg.

The demand for these coins is very large up to today, but it would be impracticable now to get out a new edition, as the cost of making such coins at the present time would be more than their face value.

Mercury-Arc Rectifier for Bern-Muri-Worb (Switzerland) Electric Railway

DUE to the large increase of traffic on the electric car line connecting Bern, Muri and Worb, Switzerland, it was necessary to enlarge the capacity of the feeding substation at Worb. This contained two 100-kva. motor-generator sets, transforming 15,000-volt, three-phase, 40-cycle current into 650-volt direct current for the road, and operating in parallel with a 330-cell, 259-amp.-hr. storage battery. The contemplated enlargement of this station would have called for an additional 200-kva. unit, and at the same time an increase of the direct-current voltage from 650 to 750. It was also intended to change over from 40 to 50 cycles. The new generator would have had to be wound so as readily to permit of these two changes.

After studying the different possible methods which might accomplish the above, the railway management decided to install one large mercury-arc rectifier, rated at 225 kw., at 750 volts direct current. The effciency of a rectifier of this type, measured between the terminals of the 15,000-volt feeding transformer and the 750-volt direct-current busbars, is stated to be 94.5 per cent at full load, including the consumption of all auxiliary apparatus, and 93.7 per cent at one-quarter load. The rectifier will operate in parallel with the existing motor generators and the battery.

The installation cost of this rectifier will be higher than that of either a rotary converter or a motor-generator set, but the higher efficiency, the possibility of carrying large overloads, the short-circuit-proof performance, the dependable service and the small maintenance cost were deciding features in favor of the rectifier, which will be biult by Brown, Boveri & Company of Zurich.

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Necessary Physical and Mental Requirements of Platform Employees

How Compensation Acts and Need for Efficiency and Courtesy Are Forcing Electric Railway Companies to Take Steps to Eliminate Applicants Predisposed to Disability—How Far the Examination Should Be Carried Is Discussed and Work on Chicago Surface Lines Reflected

BY DR. JOHN LEEMING
Medical Counsel Chicago Surface Lines
Professor of Medical Jurisprudence, Kent College of Law, Chicago

PHYSICAL and mental requirements of platform men is a subject that is prominently before us at the present time. Frequent reference is made to it in railway journals and so far as the general employment of labor is concerned medical and health journals are devoting much space to its consideration. Why is this so? Is the situation any different than it was one or two decades ago? Yes—in many ways it is. We are living in a progressive age; we are learning by past experience; we are appreciating more than ever before that efficiency depends largely upon sound mind and body.

One of the most important reasons which have drawn our attention to this subject is the experience we are having under operation of the workmen's compensation acts. Such laws have been enacted in different states in all sections of the country. A few years ago in certain states a street railway company could elect whether or not it would operate under the terms of the act, but if it elected against such operation, then its right to defend itself against damage suits for negligence, for injuries to its employees arising out of and in the course of their employment was limited by the act to the defense of no negligence alone. That is, the defenses known under common law procedure as the doctrine of (a) assumed risk, (b) fellow servant, and (c) contributory negligence were taken away from employers who rejected the act. But now and for the past few years, in many of our states, this privilege of election has been withheld and the business of operating street railways is designated as "extrahazardous." Under these acts it is no bar to recovery by the employee if his own negligence—no matter how gross—contributed to the occurrence of the accident, nor if the accident grew out of the carelessness or negligence of a fellow employee, or was due to a risk incidental to the work. The only question to be considered is: "Did the accidental injury sustained by the employee arise out of and in the course of his employment?" If so the employer is liable for compensation.

EMPLOYER SUPPOSED TO KNOW OF PRIOR TENDENCY TO DISABILITY

There is another feature of the compensation acts which accounts for the use of the word "necessary" in the title of this paper, that is, not merely the desirable requirements but the absolutely necessary physical and mental requirements for street car employees. Many men of suitable age, size and weight apply for service who are apparently sound but are found upon careful physical examination to be suffering from certain latent defects, certain tendencies or predispositions to disease which in themselves may not, at the time of the application, be positively disqualifying for the service but which, under the stress of a slight accident, "arising out of and in course of his employment," may be roused up and result in a long period of disability—for all of which period of disability, both total and partial, the employer is liable for compensation under these new laws.

These compensation acts while varying somewhat in unimportant details were originally created with the intention of "promoting the general welfare of the employee," and it was recognized as a fundamental principle that compensation should be provided for injuries without regard to the fault or negligence of the employer or of the injured employee. Hence as a matter of self-protection the employer is virtually compelled to make certain that the employee is 100 per cent sound. This will work an increasing hardship on applicants who may have latent defects, perhaps unknown to them. Yet in my opinion such defects are of sufficient importance to cause the applicant's immediate rejection. Labor organizations and others have offered criticism of the strict enforcement of this rule, but such criticisms are well answered by a consideration of the statement of an arbitrator in a recent compensation case when he said in substance in awarding full compensation: "This man's prior trouble was no doubt aggravated by the accident in question and his prolonged disability may have been due to such aggravation. The employer either knew of the pre-existing condition when the man was hired or it was his business to have discovered it."

Out of the many cases coming under my observation of apparently healthy individuals who were suffering from latent defects or constitutional taints which have proved very expensive to the employer I will cite one as an example of what lack of adequate examination means.

Mr. ————, age thirty years, married, conductor. He sustained a very slight injury in trying to close the sliding door of his car, which for some unknown reason resisted his effort. His right hand slipped from the door handle and the back of the hand struck against the door jamb, slightly bruising it. The skin was not broken but some little swelling occurred, and after his day's run a doctor painted the hand with iodine and advised rest for a day or two until the swelling subsided. At the end of two weeks this conductor applied for compensation, claiming total disability, and presented a certificate of disability from a second doctor and friend and this doctor stated that the hand was greatly swollen, the tendons being involved, and that the outlook for permanent recovery was very remote. Request was made for examination by the company's doctor, which was granted, and six weeks after the occurrence of the accident, it was made. The hand was found to be very much swollen and entirely useless; the tendons controlling the movement of the fingers were imbedded in a gelatinous exudate which suggested either a tubercular or syphilitic constitution. A Wasserman test was made of the man's blood, which revealed the fact

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that the subject was suffering from syphilis. A course of intensive treatment was instituted at the company's expense which covered a period of four months, at the end of which time the full function of the hand was completely restored.

If the bruise sustained in this case had occurred in a healthy man the disability would not have lasted more than a week at the maximum, but as he was employed with this undetected syphilitic taint, the insignificant accident localized the constitutional disease at the site of the bruise and the employer's oversight in employing a syphilitic was rectified at the expense of several hundred dollars in compensation and medical services.

In addition to syphilis and other chronic constitutional affections, I have encountered serious and costly effects from trivial injury in cases of heart trouble, lessening the power of recuperation after injury; high blood pressure, with apoplexy and paralysis resulting in permanent disability; hernia, made worse and even strangulated by an accidental lift or strain; localized focal infections in the teeth or tonsils, which favor the spread of the poison to slightly injured joints and muscles; varicose veins, which, because of a simple bump or abrasion acting as the exciting cause may bring on a varicose ulcer, practically incurable without operation; functional nervousness, when the shock and excitement attending an injury have proved to be very expensive in so-called traumatic neurasthenia and traumatic hysteria. From costly experience in such cases and many others that could be enumerated, it is shown to be entirely insufficient to reject only applicants for service who present positively disqualifying defects such as color blindness, impaired hearing, structural heart disease, pulmonary or bone tuberculosis, palpable deformity and organic diseases of the nervous system.

Sound Body Begets Efficiency and Courteousness

Are there other reasons why physical and mental soundness are necessary in transportation service employees? Without question there are many. Our journals and the daily press are constantly pointing out the importance of efficiency, safety and courtesy. How can these qualities be expected in men who are not sound in mind and body? How can a man be expected to concentrate upon his daily work and be civil to patrons under trying circumstances if he is not in good health? The general public is vitally interested in this important matter. It has a right to assume that the operators of our cars are fully competent safely to discharge their duties, and when we accept their fares as passengers we enter into a contract with them to "exercise the highest degree of care reasonably consistent with the practical operation of the road."

The important and practical question arises: How carefully should men be selected and how thoroughly should they be examined? The recommendations of last year's A.E.R.A. committee on personnel and training of transportation employees answered these questions in part; but this year's committee has been asked to pursue still further the same work and also to study the question of psychological and intelligence tests. Last year's committee submitted a minimum requirement which included examination of the sight, hearing, lungs, heart and blood pressure and urinalysis. (See recommendation 4 of committee report).

It is my judgment, based upon experience as indicated above, that this minimum requirement is entirely inadequate. It is good as far as it goes but it does not go far enough. It does not take into consideration the question of family history, previous history of applicant as to injury and disease, nature of recovery from prior illness or injury, and a careful study of a possible tendency to recurrence. The same exhaustive inquiry should be made into all possible focal infections in the teeth, tonsils, nasal and accessory sinuses, appendix and gall bladder. A full investigation should be made on the subject of past venereal diseases and their possible after effects, and if the clinical findings remotely suggest a prior syphilis, a Wasserman test should be made. The nervous, circulatory and glandular systems should be minutely investigated for the purpose of detecting any constitutional taint which might lower the applicant's resistance to injury or interfere with normal recuperation and convalescence. In other words, a full, thorough and complete examination should be made—just as thorough as that required by the best old line life insurance companies.

Applicant Must Have Average Intelligence

The committee on personnel last year gave to the important subject of intelligence examination the following brief reference: "In connection with the physical examination there should be sufficient general questioning by the physician to assure him that the applicant possesses average intelligence and mental ability.". Having been honored by being chosen a member of that committee, it goes without saying that I have no desire or intention of offering any criticism of its work, but I do desire to point out that the subject is of such importance that it calls for more careful consideration and further investigation. In justification of this statement I would call attention to the fact that in the examination of men for army service our government used "intelligence tests" in nearly two million cases and the result of these tests furnished valuable information. It is a matter of statistics that out of two million men only 12 per cent of the men so examined were found to be of "superior intelligence"; approximately 66 per cent of the number were found to possess "average intelligence" and over 20 per cent were designated as of "inferior intelligence."

These results compel us to recognize the somewhat unpleasant fact that one in every five of our able-bodied men of suitable age for train service is of inferior mental endowment and is therefore not suitable for the work of handling our passengers and acting in the capacity of our representatives on the cars. The practical consideration which therefore presents itself is at least this: How can this one man in five be eliminated?

In approaching this subject it becomes necessary to inquire, as a preliminary step, what mental and temperimental qualities a competent and efficient motorman or conductor must have.

A conductor should have a good memory, be a close and careful observer, be able to make a correct statement of any unusual occurrence, be accurate in making change, be alert in giving signals and be able to grasp situations quickly.

A motorman should possess intelligence in regard to speed; a keen perception of measurement of distances, a ready response to signals and unusual situations suddenly presented; he should have good mental poise, not becoming easily rattled or excited, able to anticipate danger and act quickly in emergencies.

It is self-evident that we should have a standard,

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that having a standard we should maintain it, not taking into our train service a single man who falls below it, and that this standard should be a high one and not any lower than the following:

A good trainman must be a man in the upper half of the 66 per cent class having average intelligence. He must have an alert and well balanced mind, capable of concentration and of forming prompt and sound judgments.

Men of such a standard and possessing these mental qualities are the type of men who are most likely to be courteous and civil, honest and prudent, steady and industrious, even tempered and amenable to discipline. These of course are essential qualities in the men we are seeking to employ.

MECHANICAL DEVICES FOR MENTAL TEST UNNECESSARY

Many mechanical devices have been contrived with the object of enabling the examiner to ascertain the intelligence status of an applicant, and they no doubt have their value. But they are cumbersome and too expensive for the majority of railway companies. When it is remembered that our purpose is to eliminate the one man in five who presents "inferior intelligence," and the lower one-half of the class of men having "average intelligence," it would seem that elaborate mechanical apparatus, electrical contrivances and stop watch accuracy would be unnecessary for a trained and skillful medical man. No criticism whatever is offered, however, if a large company finds value in installing complicated machinery such as that illustrated in the excellent article which appeared in the Jan. 28, 1921, issue of ELECTRIC RAILWAY JOURNAL. My only contention is that it is not necessary to have mechanical devices in order to be able to eliminate applicants of less than the standard degree of intelligence.

It should be borne in mind that before the applicant is sent to the medical department, he has been interviewed and passed upon favorably by the employment officer, his photograph taken, his references examined and the questions of his age, height, weight, general appearance and manner fully considered and that by this preliminary interview approximately 70 per cent of the applicants in Chicago are eliminated from further consideration. Following this weeding out process, the remaining 30 per cent are questioned closely by either the superintendent of transportation or the general manager, when another 15 per cent are rejected, leaving only 15 per cent to undergo the physical and mental examination by the medical man. During the past year on the Chicago Surface Lines, approximately 85 per cent of the original applicants for employment in the train service have been refused.

While the examining doctor is spending 30 minutes in making a physical examination, he will have considerable opportunity to size up his man; observe his powers of perception and concentration in replying to questions; consider the accuracy and readiness of his responses in making various movements as requested and of determining his general intelligence and power of judgment. In addition to these observations made by the examiner, it may be desirable to use some well devised intelligence tests. To this end, a list of such tests is now being prepared by the committee on personnel, which will be presented in the report of the committee next fall.

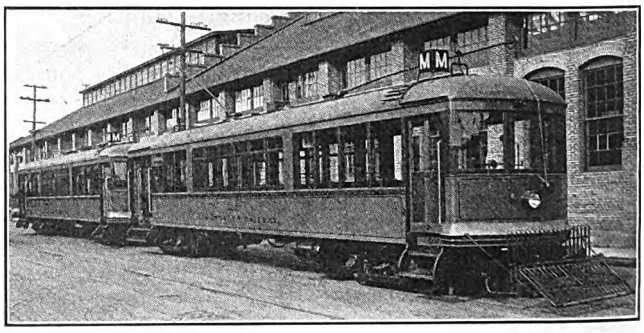
A sample question that will indicate the trend of thought which is being pursued is the following to be stated to an applicant who applies for work as a motorman: "If you were operating a car, and while it was standing, you saw a man on the track ahead of you, how would you start?" There are many possible answers to such a question, some of which might give evidence of an utter lack of comprehension, never considering the intervening distance in replying, while others might show good appreciation and understanding of the question, giving answers for different distances, evidencing thereby an intelligent response. A large number of questions or so-called intelligence tests of this character are being prepared for both motormen and conductors.

I believe the subject under consideration is one of great importance and should call for careful study and thought by all employers of labor. If the ideas suggested could be crystallized into a practical and workable plan that would be suitable for general adoption, there is no doubt that it would materially improve the personnel of our train service and result in the employment of a better class of men, both physically and mentally.

It is impossible to foretell the good which might result from such an achievement. Beneficial results would surely be reflected in the increased revenues of the operating companies because the trainmen with "sound minds in sound bodies" would be more courteous and more capable and thus win the good will of patrons. Also by their alertness and vigilance, accidents would be decreased, thus reducing a costly item of expense. And again because of this physical fitness they would be less liable to illness and much less apt to have long drawn out disability because of trivial accidents.

In the present labor market the supply of workmen exceeds the demand, and railway operators have an excellent opportunity to exercise careful discrimination in their choice of employees. Will they use the modern method for making such selections? Good judgment should dictate the answer.

Los Angeles Starts Train Operation



LOS ANGELES ADOPTS TWO-CAR TRAIN OPERATION

ALL-DAY operation of two-car trains on one of the local lines of the Los Angeles (Cal.) Railway was begun on Jan. 30. Ten trains are run on the line together with single cars, giving a ninety-second headway in the rush hours and four-minute mid-day service.

The cars used in train service are of steel construction with an inclosed center section and open sections at the rear and front. They seat fifty-four passengers and have cross seats throughout. They are equipped for multiple-unit operation with Westinghouse air brakes and two 526 L Westinghouse motors. Twenty-five of these cars have been purchased. They were designed by the engineering department of the Los Angeles Railway.

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Letters to the Editors

Valueless Valuations

NEW YORK, March 6, 1922.

To the Editors:

The recent valuations of the street railway systems in New York City, as published by the Transit Commission, recall the statement made by the late Charles A. Prouty, who was, until his untimely death, director of valuations in charge of valuating the steam railroads under the valuation act. After four years of work, he testified before the Interstate Commerce Commission: "I would rather undertake to recite the Chinese alphabet backward than read the valuation act, because it does not mean anything after you have read it."

It may safely be stated, as the New York *Times* said some time ago, that valuations do not mean anything either. If the rates of return suit the companies they care little about valuations; if the rates of return are inadequate both the rates and valuations are subjected to litigation. In the present instance the Transit Commission is apparently seeking legislative assistance to bolster up its valuations by making them mandatory and forcing their acceptance before any consideration is to be given to future rate questions. This looks like a confession of weakness and lack of faith in the valuations, while the seeking of legislative assistance leads to another saying of Mr. Prouty's: "We can regulate the railways but we cannot by legislation force one single dollar of private capital into railway investment against its will."

The futility of physical valuations has been demonstrated in one way or another on almost every street railway system in the country. No better illustration of their worthlesss character is needed than that of which the writer has knowledge wherein a firm of engineers of the highest standing prescribed values for certain pieces of property which, according to their report, should have become worthless and vanished three years ago; but the property is still in operating condition and giving satisfactory service. Such occurrences in valuations, however made, are the rule rather than the exception.

That street railways have a value to the community far beyond any physical valuation that may be placed upon them is clearly indicated by the many instances where cities and towns have bought defunct systems in order to preserve the very life and sinew of their civic existence. The strong protests from the public against the abandonment proposals of the Transit Commission covering various lines in Brooklyn are further evidence of the existence of what may be called the uncapitalized civic value of the street railway. This clearly has no direct relation to the physical value of the railway but it does represent a form of intangible value or good will which may not now be capitalized by the railways, although every form of so-called private business is permitted to and does place a value on itself as a going concern. All municipalities base their valuations of real estate for assessment purposes upon the values created by the street railways. The debt limit of New York City would be vastly reduced if it were not for the increased valuations which are based on transit facilities of all kinds.

The Transit Commission was apparently created, and has announced its intention, to conserve and preserve the street railway systems of the city, in the realization of the fact that they are a vital factor in the conduct of the business and social life of the community. Its present course in creating a means for long-drawn litigation through the medium of the valuation scheme which it has sponsored, combined with the poorly devised scheme of abandonment of lines, will not lead to an early settlement of the momentous questions at issue.

"ENGINEER."

Comment on the Standard Safety Car

UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE
BALTIMORE, MD., March 6, 1922.

To the Editors:

I do not like to bring up what is apparently a dead subject but I want to take this means of calling the industry's attention to Order No. 462 of the Public Utility Commission, District of Columbia, dated Feb. 27, on the subject of one-man car designs.

The commission has recently approved the operation of one-man cars in the district but, in its order, has taken exception to the narrow, combined entrance and exit feature of the so-called safety car and has stated as follows:

> Experience has shown that the particular type of equipment so far used has not been entirely satisfactory, owing mainly to the limitation of the entrance and exit facilities. These were originally provided in accordance with standard one-man safety car practice, but it has been found that peculiar local conditions demanded more commodious means of ingress and egress. In the latest type of one-man car placed in operation separate entrance and exit doors have been provided together with additional facilities to add to the comfort, convenience and safety of passengers.

I am merely bringing this up in order that no more mistakes will be made in the purchase of a car that cannot help but be unsatisfactory, and I am referring to the so-called standard safety car, with the narrow entrance. The more we run the correctly designed car in Baltimore, the more we realize the shortcomings of the so-called standard safety car.

H. B. FLOWERS,
Second Vice-President and General Manager.

Changes in the Cost of Living in Latter Part of 1921

CHANGES in the cost of living in five cities were given out recently by the United States Department of Labor through the Bureau of Labor Statistics.

City	Per Cent of Decrease from June, 1920, to December, 1921	Per Cent of Decrease from September, 1921, to December, 1921
Chicago	19.7	1.7
Detroit	22.7	3.0
New York	18.7	0.9
Philadelphia	18.4	1.0
Washington	19.0	1.9

The above table shows the decrease in the total cost of living in each city from June, 1920, and September, 1921, to December, 1921.

According to the *Electric Railway and Tramway Journal*, whereas twenty years ago the Leeds (England) Tramways Committee passed a resolution limiting the loading of a car to eight more than the seating capacity, it has, by a recent resolution, increased the number to twelve.

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Electric Railway Publicity

Devoted to How to Tell the Story

"Verily I Say Unto Thee"

A Protest by a Minister at Little Rock Against Reducing the Cost of "the Cheapest Thing We Have," the Street Car Ride

"VERILY I say unto thee, thou shalt not by any means go out thence, until thou hast paid the utmost farthing." With this quotation as his text Dr. J. W. Coontz, pastor of the First Methodist Episcopal Church at Little Rock, Ark., delivered a homily on Sunday evening, Feb. 19, to his parishioners on the subject "Why Reduce the Cheapest Thing We Have?" The announcement by the minister of the subject of his sermon was made through the public press. It was prompted by the passage by the Council a few days previously of an ordinance giving the Little Rock Railway & Electric Company thirty days in which to reduce its fare from 6 cents to 5 cents under its franchise.

You Must Pay Full Value

In explaining the text Dr. Coontz said Christ meant that no one should expect anything without paying full value for it. He started his talk by saying that he did not know any men who worked on the cars, nor was he acquainted with any officials of the railway company. He was too poor to own an automobile and had to ride the street cars every day, so no one could accuse him of being biased or not affected by any increase. He stated that he wanted the privilege of expressing his honest views on the subject. He continued his prefacing remarks by stating that he loved the Mayor of the city and the members of the City Council, but, in this particular case, he did not think their judgment was correct. They were making a mistake. He stated that the company could not possibly exist with a 5-cent fare without lowering the wages of the employees or greatly curtailing the service. He, for one, did not care to ride on the street car, at a reduced fare, knowing that the employees on the car were helping to pay for his ride from their own earnings, nor did he want to see the service curtailed.

He stated there was still a further argument why he did not want to see a 5-cent fare, and that is that he would not want business interests to say, "We can make money with a street car system at Hot Springs, Fort Smith, Pine Bluff and other places, but we cannot in Little Rock," and he would have to admit that the Little Rock Mayor and City Council would bring about such a condition.

He also said that the city was growing and that patrons wanted the railway extended into the suburbs. How could the public expect the company to do this, he asked, if the railway did not know positively that it was going to be permitted to make a profit. He did not know the amount of the investment made by the company, locally, but assuming that it was $250,000, he felt that it was very nice to be able to borrow the use of $250,000 at any time of the day for the price of a fare. Dr. Coontz also called the attention of his parishioners to the fact that when he boarded a car he felt very gratified to know that he had 200 men working for his convenience for the price of a single fare.

Dr. Coontz said that in all the cities with which he was familiar the railway companies had been receiving a fare of more than 5 cents. Surely, he said, "all these other Mayors and City Councils cannot be wrong while our men are the only ones that are right." This particular case reminded him of the story of the old lady who had a boy in the army—they were all marching in parade and she stood watching them, and when her boy came along in the procession she remarked: "They are all out of step but John."

The local banks got 8 per cent interest plus brokerage on loans, and Dr. Coontz said it would be foolhardy arbitrarily to tell the banks from now on they must charge only 7 per cent interest and no brokerage. He also used as an example the matter of fire insurance rates. If the City Council were now arbitrarily to name a fire insurance rate that existed, say, twenty years ago, when the losses were not near so heavy as they are at present, the companies would soon be broke. He also asked what success might attend an attempt by the Council arbitrarily to demand that real estate be sold at a price no greater than property brought twenty years ago. Even assuming that a profit had been earned from the sale of light and power it was not right to make up the loss from the operation of the railway from the revenues of the lighting department.

Company Doesn't Misrepresent Its Product

Members of the Council handed merchants the privilege of getting out and making as much money as their ingenuity made possible and never so much as looked at the merchants' book. Merchants were permitted to represent goods as they pleased, telling the purchaser that he was getting an all-wool suit when the suit was mostly cotton. Here Dr. Coontz cited specific instances and then concluded: "And do you ever hear of the electric railway trying to sell you a ride and giving you a walk?"

He said that the night before he delivered his sermon he received a special delivery letter from a woman in Little Rock who stated that she had no affiliation with the railway, but was very glad to learn that he was taking a stand in defense of the company. This lady said that all through the war the company operated without an increase in fare under heavy expenses and hardships and had been unable to get relief until just recently and she did not think the company was being treated right. The company should be made to live up to its contract, but it could not be expected to do so and not to make money. In short, his motto was: "Be fair to the company and make the company be fair to you." These illustrations used by Dr. Coontz in closing his remarks were all drawn along the line that "You cannot expect happiness, success or wealth or a future in Heaven without paying full fare for any of them."

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Go Right and You Will Be Safe!

Rule of the Road Changed in Vancouver Without Confusion—Publicity Played Prominent Part in Educational Campaign

SAFETY, safety, safety, but the greatest of these is safety! This is the message with a thousand variations which the British Columbia Electric Railway, Vancouver, B. C., spread broadcast throughout the province for many months in order to prepare the public for the new year's change in the rule of the road. The work the company did in familiarizing automobilists, pedestrians and railway passengers won the praise of the Vancouver *Sun* in an editorial, which said:

The B. C. Electric from the first assumed responsibility for making the streets safe during and after the change. The B. C. Electric went to a great deal of trouble and expense to inform and advise the public how to conduct themselves to obviate accident. Officers of the B. C. Electric have performed a real public service in their attitude on the change in the rule of the road.

Persistent articles in the official publication of the company, the *Buzzer*, forewarned that on Jan. 1:

There will be the risk in crossing the streets. . . . Look both ways and cross only at crossings. There will be the risk to children playing, roller skating and coasting on the streets. They should be taught "Safety First." Risk will lurk in passing behind a street car. The new direction of traffic will make you forget, another car may come the way you never think of.

Getting on and off the car will need attention to safety, because few of the cars will have gates. Don't get on or off when cars are in motion. Use the left hand to grab the handle in getting off, and the right to carry parcels.

The concreteness of the suggestions for avoiding accidents is considered one of the reasons for the success of the campaign. Such advice as: "Signal from the curb for cars; Stand opposite the white marks at corners while waiting for a car; Never hesitate one moment after getting off a car, but go immediately to the corner; Don't cross in the middle of the block," showed simple acts which would save trouble, time and expense.

To change from the left to the right is a matter of memory and clear thinking, according to the trolley company. The Roth memory system undoubtedly gained many new students as a result of the company's advertising. The rabbit wearing the silk hat, famed to all students of the system, is an excellent guide post to the roadway. One ear—the right, of course—stands up outside the equally famous silk hat, and that ear the pedestrian, the automobilist, the car passenger, follows. Simple, once you know how!

In one issue of the *Buzzer* was quoted a letter from the East, where life has always run on the right track. The letter said:

Why not *picture* the change to yourself at every opportunity between now and then? Just *see* yourself boarding the car at your usual spot, at the other corner. *See* yourself standing 45 ft. from the corner waiting. *See* yourself boarding that car carefully, after going straight from curb to car. *See* yourself looking both ways before crossing street. *See* yourself look before passing behind a street car.

THE STORY AS TOLD BY THE BRITISH COLUMBIA ELECTRIC RAILWAY

Vancouver residents heeded the warnings and did think, for since Jan. 1, when the street cars trundled out of the carhouses on the right instead of the left side of the street, and as the *Buzzer* said, horses long used to greeting their passing brothers with the right eye began to use the left, there have been no serious accidents. Collisions have occurred between automobiles and trolleys, but no serious damage has been done.

One of the greatest problems connected with the change was in teaching children to be careful. The British Columbia Electric issued an eight-page booklet on "Safeguarding the Children," which contained ideas for essay topics, verses with lilting meter, impressing the necessity for watchfulness, and catchy safety slogans, such as "If your ball rolls into traffic let it go until traffic passes. You can get a new ball at any store, but you cannot get a new leg any place," and this one, "Methuselah was a careful man. He lived 969 years."

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The children were also won to an animated interest in the change through an essay contest on Safety First. The sum of $30 in prizes was awarded to the three best contestants.

To automobile drivers the company paid particular attention and issued a pamphlet which the government distributed. The diagrammatic illustrations of the manner in which accidents might happen and also might be avoided did much to force drivers to go slowly, to drive on streets minus trolley lines, to keep to the side of the road and avoid car tracks, and to park machines well away from car loading points.

Car cards played an important part in the informative propaganda, and these reiterated forcefully the rules the company was sending out in bulletins and pamphlets. The company was concerned with providing the same service during and after the change that prevailed under the left-hand rules. One card asked that, "as far as consistent with safety, help maintain the speed of the service by picking out your new corner, standing where car will stop, having exact fare ready, boarding at entrance and alighting at exit, passing right inside car when the Rule of the Road Changes." This warning was heeded.

A courteous request on one of the cars won the wished-for support during upset service. The card said simply, "If your car is delayed please remember that extraordinary conditions, more tie-ups, slower loading, heavier traffic, operate against our usual quality of service. We ask you to co-operate after a delay by taking the second car."

A final display advertisement was placed in the daily papers with simple rules, easy to bear in mind, for the trolley passenger, the pedestrian and the automobile driver. It informed the riding public at what points car service would be changed, and where and how to get the right car.

The plan of the company was to leave nothing to chance, and new interurban stations were clearly indicated, exits and entrances were definitely marked on city cars, with the result that the traveling public quickly adapted itself to the new rule, and now very generally "keeps to the right."

Directory Shows How to Get Where You Want to Go

"AN OLD-FASHIONED street car ride" to the interesting places in Toledo, Ohio, is the attraction which the Community Traction Company offers to the public in a compact directory of the railway's lines. The trolley company urges less speed on the way and more observation of the points along the route.

Safety Work Strictly Organized in Memphis

THE Memphis Street Railway, in a symposium, "Truth," published in the daily papers of Memphis elaborates to interested patrons how its safety committee does its work.

There is a central committee of twelve men which plans the work to be done. These plans are transmitted through captains and lieutenants of divisions to the workers covering the system. The active committee is composed of forty workers and five executives. Their work is to encourage the practice of safety rules and cultivate friendly good will with the public, to the end that accidents may be reduced and car miles per hour increased. Meetings of the active committee are held once a month, when reports are heard. A spirit of friendly competition exists among them in the efforts to show the most favorable report. A prize is awarded to the captain of the division having the best record for the previous month.

Don't Ride Your Auto to Work

Automobilists Have Futility of Using Their Own Machines Brought Forcibly to Their Attention by Railway at Tacoma

BY C. V. ALLEN
Publicity Manager Tacoma Railway & Power Company, Tacoma, Wash.

RAILWAY owners, managers and operators point to the high cost of labor and materials, the inadequacy of fares and obnoxious or burdensome franchise obligations in seeking to explain the present financial condition of the electric railways. All of these are unquestionably drawbacks to the ability of companies to prosper, but there is another very serious contributory cause. This is the ever increasing competition of the privately owned automobile. In the industry the drain made upon gross earnings in this way is pretty well known, but practically no plan has been made to offset it, no effort made to sell the railway as against the automobile.

Today the business man who formerly used the trolley to go to his office and back now drives his machine, the woman who shopped by street car now drives her car to market, the picnic party that went by trolley now goes on rubber, the young people who were satisfied to go to a dancing party by street car now feel they must go by auto, the plumber who took the street car now drives to the job in a machine, the laborer very often drives to the factory in his own car.

In fact, the public is afflicted with "automobilitis" in a virulent form, but the majority have only a hazy idea of the high cost of such service as compared to electric railway fares.

Early in 1921 the company with which I am connected decided to work out an advertising campaign with the purpose in mind of selling electric railway service as against the automobile. All of the previous advertising of the company had been of the "display" type. The average individual considers the use of large display advertising expensive propaganda. He more or less resents it. But he knows the small "reader ad" is inexpensive. This is the kind of advertising the baker, the small grocer or the small merchant can afford, and it gets "under the consumer's skin" better.

Mainly for these reasons the company decided in favor of the "reader," the ad to be placed among the news items in such a way that the average newspaper reader would read half way through it before he would realize it was advertising. This of course necessitated enough human interest or human touch in each one to compel and hold attention.

The campaign was begun in February, 1921, with two small readers each day. The situation has been attacked from nearly all angles, but principally the advantage of the street car in economy, safety and convenience. The principal points played up have been the saving in mileage by the use of the trolley, the actual cost of running the car, the advantage of a bank account over the liability of a machine, the likelihood of theft of the car, the probable parking troubles, and the danger attendant upon driving on wet or slippery pavements. An idea of the variety of ways the question was handled is shown by the following quotations:

You can't operate that auto of yours as cheaply as the price of carfare. Take the street car.

How much time do you waste parking your auto down town? Use the street car.

Your car costs you 50 cents to $1 to go to your office

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and back. The street car costs you 16 cents. Save that difference.

Add a couple of years life to your machine by riding to work or business on the street car.

The cost of one $50 tire will pay your carfare to the office and return for one year. Take the street car.

There is more honest satisfaction in a good bank account than in owning an automobile. Take the street car and save money.

Read your morning paper on the way to your office. Save just that much of your office time. You can do it by taking the street car.

Here's a hunch—put your auto away for a few months and use the street car. With the money you will be able to save you can take a good automobile trip for your summer vacation.

* * * * * * *

Mr. Automobile Owner: Have you ever stopped to figure that picking up your friend on the way to your office adds materially to your operating expense? Take the street car.

Your car has just so many miles of life. Are you grinding its life out riding to work or office every day? Take the street car and save your machine for your pleasure trips.

Your wife would like the car to drive around in during the day. It would be mighty fine of you to go to your business on the street car and leave the machine at home for her.

The street car is the surest, safest and most economical form of conveyance. Take the street car and save money.

We know a fellow who mortgaged his home for $1,800 to buy an automobile. That little mortgage is going to take out most of the joy in his having that car. Use the street car and save money.

False pride has bought many an automobile. Be honest with yourself. Use the street car and save your money.

You ought to carry liability, fire and theft insurance on your machine. The premium on that insurance would pay carfare for a family of five for six months. Take the street car and save money.

After the novelty of driving to your business in an automobile has worn off, why not take the street car to work and back and save that daily wear and tear on your machine?

Spend and the world spends with you. Save and your li'l old bank account stands by you when the goin' is tough. Don't spend all your spare income on that machine; take the street car to your business and cut down your automobile expense.

You young fellows between the ages of twenty-five and sixty who live in the close-in residence district and drive to your office—you'll be money in pocket and in better health if you'd walk down to the office and take the street car home at night.

The whole outdoors of this wonderful Northwest is yours if you own a motor car. Keep the machine for those pleasure trips, but use the street car for business.

* * * * * * *

"Keeping up with the Jones'" has pushed many a man into buying a machine. Be sensible—use the street car.

You lose most of the "kick" in driving on pleasure trips if you pound that car of yours down to the office or shop every day. Use the street car for business.

Good salmon fishing is reported at the Narrows. Take a Point Defiance car to the park, rent a boat at the pavilion and get some real sport.

Street car service is always "on tap" for your use. Why not take advantage of it, and keep your machine to go where the street railway cannot reach. It will save you money.

Wet, skiddy pavements are accident breeders. Leave the machine at home and use the street car.

Not including direct operating cost or interest on investment, the cheapest make of car costs you nearly $1 a day just to own it. We'll try to show you: Depreciation at 20 per cent a year, $180; insurance, $60; taxes, $25; license, $10.25; new driver's license, $1; garage rent, $60; total, $336.25, or nearly $1 a day, and you haven't turned a wheel. Take the street car and save money.

Mrs. Shopper: Do you know that your purchases cost you 50 cents to $1 extra when you use your machine to make them? Shop by street car in the morning and early afternoon and you can shop very comfortably and at much less cost.

If you had to drop 50 cents to $1 in a fare box every time you drove your machine downtown and to work, we'd say you'd think twice before you did it. Save money by taking the street car.

* * * * * * *

You wouldn't wear evening clothes and a silk hat to spade your garden in. Save the wear and tear on that expensive investment, your automobile, by using the electric railway.

We know a fellow who won't go to the corner grocery to buy a yeast cake without his machine. It's the unnecessary use of your automobile that makes it expensive. Save mileage and you save operating costs.

We admit that the automobile is superior in some ways to the street car, but for every day, safe, dependable and economical service between home and business, the street car has no peer.

Depreciation, that sinister and unseen expense, is eating into the value of your machine every minute. Your dollars invested in it slip noiselessly away day in and day out. Take the street car and put your money into some income-bearing investment.

We know a man fifty-four years old whose son and daughter persuaded him to put his $800 savings into a machine. That was four years ago. They sold the machine this spring, paid up their repair bills and had $185 left. That's all that remains of that man's $800. Take the street car and save your money.

Smith and Jones both drive to their office every day. Smith thinks Jones can afford to do it and Jones thinks Smith can. Neither really can. Be honest with your pocketbook and use the street car.

Are you like the ostrich, sticking your head in the sand when it comes to figuring up what the machine is costing you every day you operate it? Take the street car. The wise man is using it to go to his office and back.

It costs you at least $1 a day to run that car to the office and back. Is the difference in the service between the street car and your machine worth that surcharge?

* * * * * * *

The little touch of humor which it was attempted to inject in the advertising has resulted in the paragraphs being quite generally read and without question has materially aided in holding business for the railway and should help substantially in attracting new patrons.

While it is difficult to compute exactly what effect the campaign has had on the riding, the total business of the company has held up to the record of a year ago, although sales in practically every other line of business have fallen off very heavily. Additional proof is the direct evidence of people who have made statements to officers of the company that they had followed the suggestions made in the advertising. Taking into consideration the lower cost of the advertising and its effective appeal to the common sense of the public, the company considers this particular advertising the most effective it has ever done and regards the results as more apparent than those obtained from any other advertising which it has ever attempted.

Ohio Road Starts Advertising Campaign

TO COUNTERACT propaganda calling for a reduced fare which is being circulated in Springfield, Ohio, the Springfield Railway has started a newspaper advertising campaign in an effort to show that the present fare of seven cents is very reasonable. An advertisement believed tc have had the greatest effect in this respect is one in which a comparison is made of the transportation facilities of thirty years ago with those of the present day. The advertisement showed the picture of one of the old horse cars and beneath it appeared a picture of the modern electric street car. The "ad" is three columns wide and one page in depth.

"Thirty years ago folks rode in mule-drawn street cars traveling at a speed of four miles an hour and cheerfully paid the 5-cent fare. Today they ride in commodious, sanitary, comfortably heated and lighted cars at a speed of from 15 to 20 miles an hour at an increase in fare of only 2 cents," says the advertisement. The "ad" is convincing with respect to the improved service now offered.

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Power Plant Economics Discussed by Engineers in New York

At Largely Attended Joint Meeting of Local Sections of A.I.E.E. and A.S.M.E. Turbine Tests, Boiler-Room Practice, Power-Plant Auxiliaries and Related Topics Were Covered in Papers by Operating Engineers

THE power-plant operating men ran the joint meeting of the American Institute of Electrical Engineers, New York Section, and American Society of Mechanical Engineers, Metropolitan Section, held in the auditorium of the United Engineering Societies' Building in New York City, on Feb. 24. Part of the formal and informal discussion is of interest to electric railway engineers concerned with the power plant. This refers particularly to the report upon efficiency tests of a 60,000-kw. cross-compound triple-cylinder steam turbine, by H. B. Reynolds and W. F. Hovey of the Interborough Rapid Transit Company; the paper on boiler-room economics by I. E. Moultrop and R. E. Dillon of the Edison Electric Illuminating Company of Boston, and the summary of methods of energy supply for station auxiliaries and their relative merits by H. C. Albrecht of the Philadelphia Electric Company.

Electric Railway Energy Produced on 11 Lb. of Steam Per Kilowatt-Hour

The tests reported by Messrs. Reynolds and Hovey were completed recently upon the 60,000-kw. turbo-generator unit described in an article by W. S. Finlay, Jr., printed in the issue of the ELECTRIC RAILWAY JOURNAL for May 10, 1919, page 906. The unit consists of one high-pressure element and two low-pressure elements, each driving a separate generator.

The normal steam pressure at the throttle is 220 lb. absolute, with a superheat of 150 deg. Fahr., exhausting into a vacuum of 29 in. of mercury, referred to a 30-in. barometer at 51.1 deg. F. The speed of all three elements is 1,500 r.p.m.

The unit is provided with a number of automatic features which make it possible for any one of the three elements to go out of service and allow the remaining elements to remain on the line to take care of the load. It has not been possible to make full use of these automatic features up to the present time, due to the absence of a relief valve on the exhaust of the high pressure turbine.

Most of the tests covered in the present report were of three hours' duration. With the exception of a few special tests, the turbine was operated under normal conditions, in so far as the type of load was concerned. The load was controlled from the switchboard through the remote governor-control system provided for that purpose. This method of controlling the load subjected the turbine to the full swings of the railway load. Two series of tests were run, one with the complete unit in service and the other with the high-pressure and one low-pressure turbine in service.

The accompanying sets of curves give the general results of the tests, with particular reference to the total steam consumption and water rates of the units, and the thermal and Rankine-cycle efficiencies.*

From the curves it will be seen that the lowest water rate obtained while the complete unit was operating under normal conditions, was 11 lb. per kilowatt-hour, while the highest Rankine and thermal efficiencies obtained were 76 per cent and 25.1 per cent respectively. With the high-pressure and one low-pressure turbine in service, the lowest water rate was 11.25 lb. per kilowatt-hour. It will be noted that the water rate of the unit when the high-pressure and one low-pressure turbines are in service is better than that for the complete unit at loads below 25,000 kw.

In the discussion of this report Francis Hodgkinson, mechanical engineer Westinghouse Electric & Manufacturing Company, a leading steam-turbine designer, said that these tests had been made with scrupulous care and the results obtained were undoubtedly correct. While the manufacturers would have liked to see a still lower water rate indicated by these tests, they had no reason to be dissatisfied.

Present-Day Boiler Room Operation

The subject of power-plant operation was continued by Messrs. Moultrop and Dillon, who said that there is no part of a steam generating power plant where scientific methods can be better employed than in the boiler room.

As to the power plant in general, a modern station is operated with one oiler and one fireman for each unit of 30,000 kw. or larger. The output per man is twenty times as great as in early stations. Furthermore 2.55 lb of coal, or 37,000 B.t.u., was required in the old engine-driven plants to produce 1 kw.-hr.; now this is accomplished with 1.25 lb. of coal or 18,100 B.t.u.

Large-capacity boilers equipped with modern fuel-burning furnaces, such as are going into many plants today, have an efficiency of 80 to 85 per cent at the operating point of loading, a gain of 15 to 20 per cent over types installed ten years ago.

Another factor is the improvement in maximum load that can be supplied by a given number of boilers. In a plant built in 1905, the ratio of maximum load to capacity of boilers was 1 kw. per 10 sq.ft. of boiler heating surface installed; today it is 8 kw.

The character of the daily load curve has an important bearing on operation. If the curve is flat and without peaks, it will pay to operate the boilers at as near the point of maximum efficiency as is consistent with good operation and labor conditions, and as the capacity of the plant will permit. If there are peaks in the load curve, however, the degree of forcing over these peaks and the amount of banking to provide for them will depend on various considerations.

For example, the question arises whether boilers should be forced over the peak or additional boilers should be banked for it. The duration of the peak enters into this question, and the type of equipment determines how long a given high rate of forcing can be maintained without difficulty in keeping the fires in condition. Much higher rates can be employed for short periods than for longer ones. Furthermore, the extent of high forcing and the periods used affect the maintenance costs, which mount rapidly with high rates and with the length of time these rates are used.

There is a point at which the loss due to the burning of extra fuel by forcing at a high rate over a peak is equivalent to the loss due to the alternate case of carrying additional boilers for this peak.

The boiler-room foreman is responsible for having a sufficient number of boilers lighted to take care of the daily peak and the proper number steaming to give best efficiency at all times. He authorizes the number of boilers to be brought into steaming or to be taken out to provide for the load.

Here the fireman's duty begins. With the knowledge of the load to be carried and the number of boilers to have steaming to carry this load, he determines by his instruments and his instructions how much coal he must burn in each furnace to produce the necessary steam. He adjusts his equipment and studies his measuring instruments to insure proper operation.

In the effort to secure high efficiency in the boiler room, due consideration must be given to co-ordination with other parts of the plant. It is the efficiency of the boiler room and turbine room in conjunction which tells the final story. Too often it is thought that the measure of efficiency is the loss to the ashpit and up the stack. This will not prove to be the case until this loss is weighed against the loss of heat to the circulating water in the condenser. Feed water can be heated throughout the greater part of the temperature range from either of these two sources of heat. However, by utilizing some of the heat that would otherwise go to

*The Rankine efficiency is that which would be secured if all of the energy represented by the difference in heat energy of the steam entering the turbine and that leaving the turbine were converted into useful work, the thermal efficiency being the ratio of the work done to the energy in the entering steam.

The Willans line shown with the water-rate curves is plotted between total steam consumption and load. It was actually the basis for calculating the water-rate curves. The original shows breaks corresponding to the opening of the by-pass valves.

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waste in the circulating water, the turbine room gets the credit rather than the boiler room, and provided this credit outbalances the loss in the boiler room, the transfer is justified.

The story of present-day boiler room operation would not be complete without a word about conditions under which the men have to work in the boiler room. In modern plants it is the established practice to spare no expense in making conditions safe and eliminating accident hazards, providing plenty of light everywhere around machinery and plenty of space, and keeping the stations clean. The additional expense that has been put into stations to improve conditions has given a high return on investment, and this factor alone has contributed in a great degree toward efficiency.

Electric Drive for Steam Generating Station Auxiliary

In his paper on auxiliaries, Mr. Albrecht began by saying that in the past few years the use of electric drive for generating station auxiliaries in preference to steam drive has increased tremendously, particularly in modern plants. This change in practice has been brought about largely by the following factors:

1. Increased auxiliary power demands per kilowatt of generating capacity.

2. Wider latitude in selection of methods for obtaining heat balance under all conditions of varying load and seasons.

3. High maintenance cost of speed-reduction gearing generally used with steam-driven equipment.

4. High condensation losses and complications of auxiliary steam piping.

5. Further application of alternating current to auxiliary drive.

Energy for electric drive for auxiliaries may in general be supplied from: (a) The main generating unit or main bus, (b) a house turbo-generator, or (c) a combination of supply from main unit or main bus and house turbo-generator.

Any of the methods of supply mentioned may be arranged so that the supply will be from: (a) a common system for all of the station auxiliaries, or (b) a segregated system arranged for operation of several selected groups of auxiliaries which may be so chosen as either to include a portion of the boiler auxiliaries and either all of the auxiliaries of an individual main turbine or pair of turbines, or only certain auxiliaries from two or more turbines. The former arrangement has the disadvantage that an interruption in the service may affect all of the auxiliaries supplied from the common bus, and the latter practice is of particular advantage when important motor driven auxiliaries are provided in duplicate.

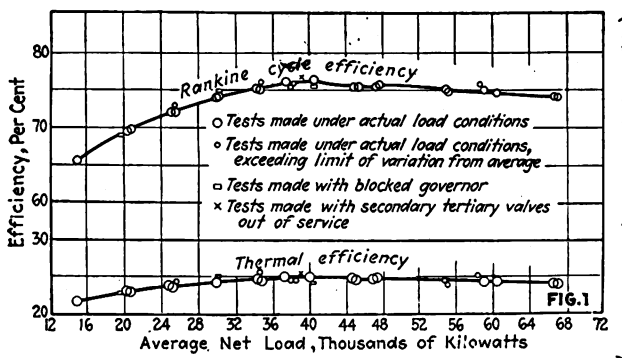
Special precautions should be taken to include electrical equipment used in the supply and control of motors driving auxiliaries in boiler and turbine rooms, inasmuch as the operating personnel is probably not familiar with such equipment.

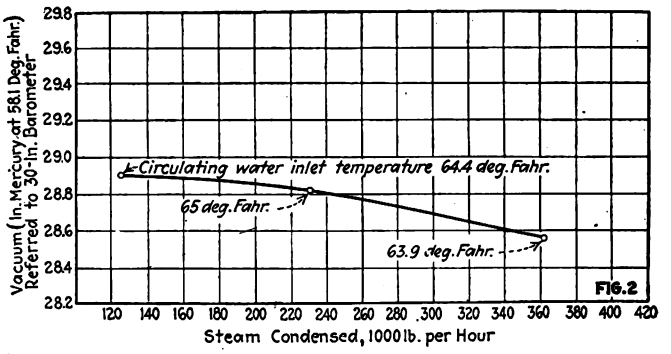
In the application of the alternating-current motor to auxiliary drive, one of the chief problems has been the development of satisfactory equipment for variable-speed service. The direct-current motor until recent years has been used to a great extent for this service, principally because of its very satisfactory inherent characteristics for such application.

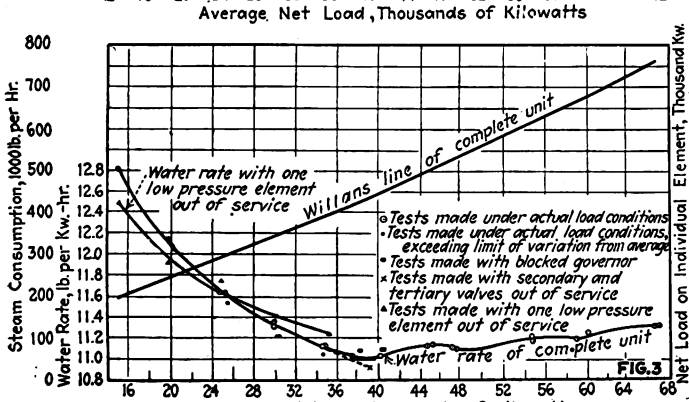
In considering the extensive use of electric drive, it is necessary that the selection and layout of the equipment should be such as to give a high degree of reliability, because of the importance of the service. In case of trouble, defective equipment must be immediately isolated with a minimum effect on other apparatus. It is of interest to record the use for the first time in large generating stations of truck-type switchboard equipment in connection with the 2,300-volt supply to station auxiliary motors in both the Hell Gate Station in New York and the South Meadow Station in Hartford. This type of auxiliary drive has such an important bearing upon the method of securing heat balance and consequently upon station economy and upon simplicity and ease of operation that there should be complete co-operation between mechanical and electrical design and operating engineers in its selection.

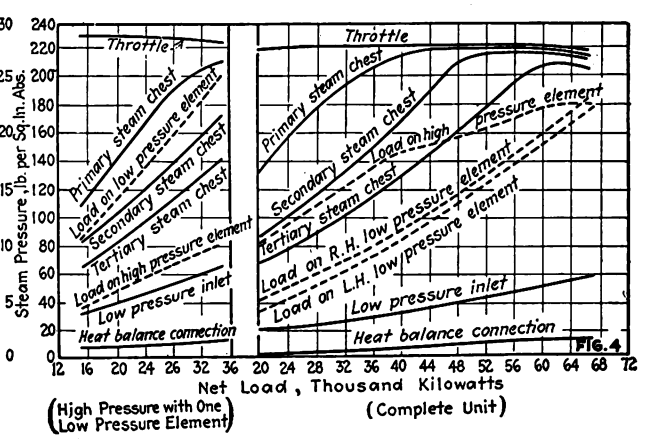
Other Ideas as to Auxiliaries

An interesting discussion followed the presentation of Mr. Albrecht's paper. R. H. Tabscott of the New York Edison









RESULTS OF TESTS ON 60,000-KW. TURBINE OF INTERBOROUGH RAPID TRANSIT COMPANY

Fig. 1. Efficiency of turbine expressed as ratio of mechanical output to thermal input, and as ratio of actual output to theoretical output.

Fig. 2. Relation of vacuum obtained in condenser to rate of steam condensation.

Fig. 3. Water-rate curves.

Fig. 4. Distribution of steam pressure throughout the turbine plotted against load.

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Company, pointed out that in large plants the auxiliary service substation may be as large as, or larger than, any substation on the system, and hence must be made just as reliable, if not more so. Mr. Hodgkinson expressed the belief that selection of auxiliary drive offers the greatest opportunity for economy. Reliability is no longer an advantage peculiar to steam-operated equipment, he declared, and necessity for exhaust steam for feed-water heating is not so important with economizers. Even if feed water must be heated, that is no reason why uneconomical drive should be employed for auxiliaries.

He expressed a preference for house turbo-generator supply to auxiliaries, citing the advantages of the methods used by the Duquesne Light Company for obtaining a heat balance.

Conference on Crossing Specifications

Representatives of Railway, Railroad, Lighting, Power and Other Interests Met in New York and Agreed to a Program Which Will Bring About a Desired Harmony Among Conflicting Requirements

A LARGE and representative conference met in New York City on March 2 to consider the question of uniform specifications for crossing of overhead wires and to dispose, if possible, of certain differences of opinion in regard to Part 2 of the National Electrical Safety Code which deals with overhead lines. The conference was called by the American Engineering Standards Committee at the request of the American Electric Railway Association. The call for this meeting was explained in the issue of this paper for Feb. 25.

As a result of this conference the following resolution was adopted: Resolved, that it is the opinion of this conference that: (1) The remaining differences of opinion on Part 2 of the N.E.S. Code are small, and the different interests are approaching agreement, and that it is therefore advisable: (2) That the N.E.S. Code should be approved by the A.E.S.C. with the understanding that (3) there should immediately be organized a thoroughly representative sectional committee under the procedure of the A.E.S.C. to consider any revisions of Part 2 of the code which may be deemed necessary by any of the interested parties, and that (4) there should be a set of national specifications for crossings between overhead electric wire lines, because there is disagreement among existing specifications, and that (5) such specifications should be prepared by thoroughly representative sub-committees so as to make them in agreement with the code, with such revisions as may be made under the provisions of item 3 above.

In order to carry out the essentials of this resolution a conference committee representative of the groups, with Sidney Withington as chairman, was appointed to confer with Dr. P. G. Agnew of the American Engineering Standards Committee, to organize and decide on the various make-up of the sectional committee.

Discussion Which Led Up to the Resolutons

In opening the discussion, M. B. Rosevear, superintendent of distribution Public Service Railway, Newark, N. J., presented, for the American Electric Railway Association, a statement outlining the considerations which had led the association to request the conference and stating in general terms its position on the various items of the proposed agenda. This was followed by a brief statement by W. A. Durgin in regard to the general work of the Department of Commerce in promoting simplification in industry and industrial standardization along national lines. Dr. M. G. Lloyd, on behalf of the Bureau of Standards, then briefly outlined the development of the National Electrical Safety Code and its present position before regulatory bodies and utility companies and associations.

John Murphy, electrical engineer Board of Railway Commissioners, Ottawa, Canada, representing his commission and the Canadian Engineering Standards Association, outlined the status of crossing specifications in Canada. There the Board of Railway Commissioners has general jurisdiction over wire lines crossing or passing near railway right of way, and also over other wire crossings in case either one of the companies concerned is operating under a Dominion charter. The rules which have been followed by the board are simple. They work out so satisfactorily from the viewpoint of the railways, telephone, telegraph and electric light companies, that the Board of Railway Commissioners does not hear from one per cent of the cases which arise. The great feature is that the parties concerned must of necessity get together and co-operate before the work is done.

Discussing crossings generally, A. E. Davison, of the Hydro Electric Power Commission of Ontario, said that the commission has some 1,500 crossing and allied agreements, the majority of which come under the jurisdiction of the Board of Railway Commissioners. These crossings, wherever carried out in accordance with the sense and intent of the regulations, have operated without failure. Inasmuch as some of these crossings are twelve years old or more, special attention must shortly be given to inspection for maintenance. Since there is developing in Canada a tendency to criticize the above rules with the idea of strengthening the structures and wires crossing over supply conductors, the commission was pleased to have the opportunity of co-operating the work of the present conference.

More than fifty delegates were present at the conference, all the principal interests being strongly represented.

Those present were: For the American Institute of Electrical Engineers, Percy H. Thomas; for the American Electric Railway Association, M. B. Rosevear, Charles R. Harte, R. W. Eaton and E. H. Scofield; for the American Railway Association, G. H. Dryden, Sidney Withington, J. H. Davis, E. B. Katté, J. C. Davidson, G. Eisenhauer, F. D. Hall, M. A. Baird, H. A. Shepard, L. C. Wells, I. C. Forshey and I. T. Seaver; for the American Telephone & Telepragh Company, K. L. Wilkinson and J. W. Hines; for the Bureau of Standards, Dr. M. G. Lloyd and H. H. Buell; for the Canadian Engineering Standards Committee, John Murphy; for the Electrical Manufacturers Council, Frederick Nicholas; for the Federal Power Commission, Charles E. Oakes; for the National Electric Light Association, Thomas Sproule, Paul Spencer, W. J. Canada, A. E. Silver, W. T. Morrison, J. C. Martin, and W. T. Oviatt; for the Postal Telegraph Cable Company, D. H. Gage; for the United States Independent Telephone Association, J. W. Morrison; for the Western Association of Electrical Inspectors, R. L. Daniel, F. A. Cambridge, J. T. Greene and W. S. Boyd; for the Western Union Telegraph Company, P. J. Howe, Douglas P. Dickie and C. P. Siedler; for the American Engineering Standards Committee, S. G. Rhodes; for the National Safety Council, F. W. Mitchell; for the Department of Commerce, W. A. Durgin and R. M. Hudson; for the United States Department of Labor, P. C. Menges; for various state commissions—Connecticut, A. E. Knowlton; Iowa, A. B. Campbell; Minnesota, D. F. Jurgensen; New York, C. R. Vanamen, W. C. Whiston and F. G. Daniell; Rhode Island, W. C. Bliss; Virginia, W. F. Rhea; Indiana, E. M. Blessing, and Hydro-Electric Power Commission of Ontario, A. E. Davison.

Executive and Subjects Committees to Meet

THE next meeting of the executive committee of the American Electric Railway Association will be held at association headquarters in New York on Friday, March 24, 10 a.m.

Chairman C. D. Emmons of the subject and meetings committee of the American Association has called a meeting of that committee for Friday afternoon, March 24, at association headquarters. The particular problem ahead of the subject and meetings committee now is the annual convention to be held in Chicago in October and the committee plans to get an early start on this work.

The committee will undoubtedly be most glad to receive suggestions from the membership as to subjects for the Chicago convention program.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Fare Reduction Unlikely

Head of Road at Springfield, Mass., Sees No Immediate Hope Ahead for Car Rider

In a statement following the announcement of the arbitration decision reducing wages and revising working conditions on the system, Clark V. Wood, president of the Springfield Street Railway, said that he could see no prospect that the 7-cent fare would be reduced before 1923. A reduction of the fare would be possible, he explained, only in the event of a pronounced increase of traffic or a further reduction of wages.

At present he can see no prospect of any marked traffic gain, and a further reduction of wages this year is barred by the agreement. He said that the wage as reduced by 10 cents an hour is still higher than the wage necessitating an increase of the fare from 5 to 7 cents in 1919. However, he said, in the event of a general industrial revival in the territory served by the company it is hoped that it may be enabled to take up the matter of a fare reduction earlier than can now be foreseen.

The statement called attention to the expenditure, estimated at more than $350,000, which the company faces in connection with the new Connecticut River bridge, and the maturity April 1 next of $1,700,000 of 4 per cent bonds. This would have to be met, it is stated, by either refunding or extension, entailing in either case a probable increase of the interest rate. In summing up, the statement says:

> Under these circumstances the management feels that its first obligation to the public is to maintain and, so far as circumstances will permit, to improve its service to the public; that its second obligation is to place its securities on a basis where the investing public will purchase them, thus assuring a continuance of its ability to furnish adequate service, and that its third obligation is to furnish that service at the lowest possible rates consistent with the performance of its other two obligations.

Following the award of the arbitration board in its case, the Springfield (Mass.) Street Railway rearranged its schedules and placed 49 runs on the spare list. Extension of the spread of hours for spare men from 11 to 14 enabled the company to arrange the runs to better advantage with the result that about 75 men have been laid off. At the same time, all runs manned by regular crews were rebid. There is no curtailment of service. The reduction of regular crews involving the placing of 180 men on the spare list was carried out against the protest of the leaders of Springfield branch of the Amalgamated Association of Street & Electric Railway Employees. Complaint was made to the union's counsel, James H. Vahey, and it is stated that he will take up the question with James J. Storrow, neutral arbitrator in the recent proceedings, alleging that the new arrangement is in violation of the terms of the award, in that the runs placed on the spare list should have been posted for rebidding. Under the recent award the spare men have a guarantee of seven hours work in fourteen, in place of nine in eleven, as before.

Chicago Matters Before Commission and Council

Seeking to show the reduced cost of living and of railway materials, the attorneys for the city of Chicago had several business men as witnesses before the Illinois Commerce Commission during the week ended March 4. There was also some discussion of wages in various industries, but none bearing on rates of pay for electric railway men. E. H. Morgan, superintendent of schedules for the surface lines, was also called as a witness by the city and admitted that the non-revenue hours paid for in the companies' time tables amount to about 19 per cent of the total. He stated, however, that most of this had been imposed by boards of arbitration following strikes.

Plans for consolidation of the surface and elevated lines have been discussed before the local transportation committee of the City Council and apparently will not be consummated in the near future. However, a number of engineers are drawing plans for a subway system. One plan was submitted by Alderman Cermak which calls for a six-track subway for freight as well as passengers, serving the whole city and costing about $750,000,000. It is likely that a plan calling for the expenditure of the $30,000,000 in the traction fund will be presented.

Puget Sound Company's Appeal Denied

The United States Supreme Court on March 6 denied the application of the Puget Sound Power & Light Company, Seattle, Wash., for review of a decision rendered against it by the United States District Court for Western Washington in proceedings brought against S. B. Asia, Daniel W. Bass and others. The power and light company, as the owner of $15,000,000 municipal street railway bonds of Seattle, sought to set aside a decision obtained by Asia and his associates in a suit brought by them against the city to restrain, among other things, the application of the gross revenues of the municipal railway system to the payment of principal and interest on the bonds in preference to charges for maintenance and operation.

Sir Adam Raps Radial Report

Head of Power Commission Differs Violently With Sutherland Recommendations on Radials

Sir Adam Beck, chairman of the Hydro-Electric Power Commission of Ontario, has launched an attack upon the findings of the Sutherland Hydro Radial Commission. He calls into question not only the soundness of the judgment shown by the majority of that commission in its condemnation of radials, but directly reflects upon the fairness and motives of the commissioners themselves. While the Hydro-Electric Commission chairman issues a foreword with the statement, the document itself is essentially an engineers' report, which takes up, item by item, the findings of the Sutherland Commission.

In his foreword Sir Adam says:

> I, for one, regard it (the majority report) as permeated by misunderstanding or by the misinterpretation of evidence, and by the omission of essential data, to an extent which nullifies its usefulness as a judicial document, and as a criterion by which either to approve or condemn the Hydro radial project.
>
> The experts of the Hydro-Electric Power Commission still believe that the proposed Hydro radial system may successfully be carried forward along the lines originally recommended, and there has been nothing disclosed, either by the Sutherland Commission or through any other source, which has in any degree lessened their confidence in the radial project recommended—a project which can scarcely fail to be of very great social, commercial and financial benefit, not only to the municipalities directly concerned, but also to the Province, and, indeed, to the Dominion as a whole.

Sir Adam deals only with the Sutherland majority report. His criticism is prefaced by a brief review of the situation arising out of the adverse finding of the commission. The Sutherland report had unsettled the public mind as to whether radials could be constructed and operated as to be made self-sustaining and without producing a duplication of lines, and it was to clear up the situation that the reply had, at the request of the Hydro radial municipalities, been prepared.

Sir Adam trains his guns upon the qualifications of the experts upon whose advice the commission relied in preference to that of Bion J. Arnold, the expert engaged to make a report for the municipalities, and whose endorsement of the radial scheme was derided. Mr. Arnold, it is pointed out, was himself the owner and operator of an inter-urban electric railway, and recognized as one of the most eminent experts in his field. On the other side, the Sutherland Commission relied upon, first, three men who were steam railroad experts, W. F. Tye, George C. Martin and F. P. Gutelius, whose experience was not applicable to electric lines.

Sir Adam claims that C. E. Bailey and L. A. Herdt, two other "experts,"

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whose judgment was accepted by the commission, and R. B. Rifenberick, who was retained as chief consulting expert, could not be classed as operating experts, and goes on to say that apart from some Canadian officials called to testify respecting conditions on certain local steam and electric lines, the only men called who might really be regarded as electric railway operators were F. W. Coen, R. M. Feustel and Robert I. Todd.

Of these Sir Adam's engineers claim that while their testimony would be of value if they were speaking of matters of which they had first-hand knowledge, their testimony upon the Hydro radial project was entitled to practically no weight "because of the almost total ignorance of these men with regard to the specific Hydro radials under discussion."

This "almost total ignorance" is shown by extracts from the evidence of the three experts.

The Hydro chairman closes his statement with a reiteration of the confidence in the whole radial scheme and an assertion of his belief that if the data presented had been rightly applied by the Sutherland Commission there would have resulted a clear and outstanding demonstration of the soundness of the estimates of the Hydro Commission's experts.

The report of the commission appointed to inquire into hydro-railway railways — known as the Sutherland commission — was issued in brief in August, 1921. It was not until last December that the report was printed in full and made available to the public. Just at that time Sir Adam says he was busy with the work incident to opening the Chippawa plant and with other matters so that detailed consideration of the Sutherland report was not possible. Moreover, it would not have been advisable to reply until the report was in the public's hands.

The real battle over the hydro-electrics seems only just about to begin. Speeches by Premier Drury indicate that the Government has under consideration the repealing of the existing Hydro-electric Radial Railway legislation, and the passing of legislation, in lieu thereof, which will authorize the construction and operation by the municipalities, or groups of municipalities, of such Radial Railways as the municipalities may approve under a commission, or commissions, appointed by the municipalities against this the municipalities are up in arms. They have adopted resolutions roundly scoring any such proposal and have forwarded them to the Premier and to each member of his cabinet. Among other things the point is made that, as the Hydro-electric Power Commission already manages the Windsor, Sandwich & Amherstburg Railway and the Guelph and Peterboro' street railways, and prospectively the York Radial and other lines for which rights-of-way are already purchased, "it would be suicidal to provide any other management for other and connecting electric railways."

Preparing for Detroit Election

On April 17 Voters There Will Decide Purchase of Detroit United Lines for $19,850,000

At the special election to be held on April 17, at which the voters of Detroit, Mich., will decide as to the immediate taking over of the Detroit United Railway lines, a bond issue of $3,500,000 will also be voted on to finance the down payment of $2,770,000 agreed upon and to purchase certain material from the company as well as furnish working capital to start with.

UNPAID BALANCE A LIEN AGAINST RAILWAY

The terms of the proposed agreement provide that the city pay $500,000 every six months until Dec. 31, 1931, when the balance remaining unpaid would come due, interest to be paid quarterly at the rate of 6 per cent a year. It was announced that with estimates based upon a 5-cent fare, the city expects to pay its annual payments and interest charges and own the system free and clear by 1931, paying for it out of earnings.

The City Council has adopted a resolution authorizing the City Clerk and City Election Commission to prepare for the special election on April 17, and directed the appropriation of $87,525 to cover the costs of the special election and the registration required by law to be held prior to the election. The special election in the spring was favored by Mayor Couzens believing that if the fall election were waited for, the company would let its lines depreciate in the meantime and that the earnings during the summer would be lost.

The unpaid balance would not at any time be considered as a lien against the city, but would become a lien against the railway property.

It remains for the city to obtain a 60 per cent majority at the coming election in favor of the adoption of the purchase plan. If the plan is approved the two systems now in operation in the city will be consolidated under city ownership and operation.

NO INTERURBAN LINES INCLUDED

Louis A. Goslin, a Montreal director of the Detroit United, read to the stockholders the resolution providing that they approve the action of the board of directors in accepting the offer of the city of Detroit for the company's so-called city system of railway, including tracks, overhead equipment, cars, real estate, shops etc., with certain reservations agreed upon for the price of $19,850,000. The resolution was seconded by J. C. Butterworth, another Montreal stockholder, who was a member of the committee appointed by the Detroit United Railway to confer with the city on terms of the sale. Mr. Butterworth was active in the controversy among Detroit United Railway stockholders at the annual stockholders' meeting when control was won by the Canadian stockholders.

A resolution read by Avila Gingras, Montreal, was adopted providing for the adjournment of the stockholders' meeting, to meet again on March 10, for the purpose of considering the formal agreement to be entered into between the company and the city for the sale of the system. The resolution further instructed the secretary to send to each stockholder of the company a notice which shall contain the general terms of the proposed sale, and advising them that a formal agreement covering the terms of sale will be submitted to the stockholders at the adjourned meeting for ratification by them.

The city's payment plan, it is understood, was received with favor by the Canadian stockholders since the company will be enabled to meet its interest charges and make a considerable saving on the difference in interest rates between what the company pays on its bonds and mortgages, and the higher rate to be paid by the ctiy.

It has been pointed out that if the city buys the Detroit United Railway's city system the private company will still have its interurban system, which is considered one of the finest and most strategically situated in the country and the city will have a total mileage of more than 350 miles of tracks, probably the largest municipally owned system in the world.

Central New England Road to Try Gasoline Coach

Plans are under way for a tryout of the new gasoline passenger coaches of the Central New England Railroad, Poughkeepsie, N. Y., to take place in Dutchess County some time this spring.

Announcement of this possibility was made by J. W. Cuineen of Danbury, general superintendent of the Central New England, in a talk before the Dutchess County Get-Together Association recently. Mr. Cuineen said:

"We are up against a proposition the railroads never met before. We have the competition of motor buses, jitneys and motor trucks. We have no quarrel with the motor truck. There is room for it, and for the railroads, but we feel that the commercialization of the highways should be paid for. The railroads pay taxes. The railroads feel that they are not used right in allowing this competition right alongside of them.

"So in order to reduce our costs we are experimenting with what they call the gasoline passenger coach. The New Haven road was the first to use it.

"I have one in my territory operating from Litchfield to Danbury, a distance of 40 miles. There is also one from Danbury to Waterbury, a 15-mile run. The coaches carry thirty-five people and have an average speed of 40 m.p.h. Probably future cars will have larger seating capacity. We want them to carry from sixty to seventy-five passengers."

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Commission Wants Friendly Suits to Determine Rights of Bodies

The California State Railroad Commission in a letter, dated March 2, to the Los Angeles Board of Public Utilities expressed its willingness to terminate on March 7 the working agreement between the two boards entered into during the year 1916 for the joint and co-operative regulation of public utilities service in Los Angeles.. The letter came as a result of the determination of J. P. Kennedy, the newly-appointed public utilities commissioner of Los Angeles, to test the jurisdictional matter between the two boards in the courts.

The letter outlines that the commission recognizes that the city of Los Angeles has jurisdiction in some cases, but declares that the commission's jurisdiction includes the regulation of all service matters that "are directly connected with or related to the fixing of rates," and also in cases where the public utility under consideration renders service extending to the public both within and outside of the city. The commission suggests friendly suits that "all questions of jurisdiction may be definitely and authoritatively determined by the courts."

The commission calls the attention to the fact that the working agreement between the city of Los Angeles and the State entered into in 1916 was based upon the belief by both State and city officials at that time that "it was more important that the commission and the city both devote their energies to securing the best possible service conditions than to quarrel about whose duty it was to do the job."

The letter states further the members have no apology to make for the existence of the working agreement between the city and the state boards, which the rail commissioners say, "has promoted the best interests of the citizens of Los Angeles, who are dependent for service." The state commissioners firmly point out in their letter that "in the future we shall exercise to the fullest extent such jurisdiction as we possess under the law to secure the most efficient service for the people of Los Angeles."

City of Montevideo Seizes Tramway Undertaking

An extraordinary situation affecting not merely British interests in Montevideo but also Uraguayan credit in the markets of the world is disclosed by Mr. Betterton's question in the House of Commons on Feb. 20 respecting the forcible seizure and disbursement of the funds of a British-owned tramway system by the Municipality of Montevideo.

It appears that at the beginning of the year the employees of the two Montevideo tramway systems struck for a large increase of wages. When the strike had lasted three weeks the municipality ordered the company to resume service and the men to return to work, promising to give the latter their terms. The service was resumed at the end of January and since the company in question was unable to pay the wages demanded the municipality forcibly seized its funds and itself paid the men.

This arbitrary action is the climax of a somewhat critical situation dating back to 1918. Tram fares have not been increased all through the war, but in 1918, with a view partly to improving the welfare of the men and partly to meeting increasing costs, the company applied for permission to raise the fares. This was refused. In 1920 the application was renewed and under a promise that it would be granted a small increase of wages was given on account. The promise, however, never materialized. The company was thus involved in heavy losses, which were further increased by the passing of some extraordinary social laws which require the company to make payments and incur expenses not provided for in its concession.

Although the welfare of the workers is ostensibly the pretext for these high-handed proceedings, an attempt to establish municipal control is suspected.

Abundance of Railway Matter Before Legislature

Massachusetts has a long legislative programme this year affecting the electric railways. All the matters are still before the street railway committee of the Legislature, no action having been taken yet on any of them. However, a few hearings have been held.

One proposition before the 1922 Legislature is for the State to buy the bonds of the Boston Elevated Railway. Another plan calls for the removal of the surface structures which the Boston Elevated Railway maintains in Harvard Square, Cambridge, in connection with its subway service there. One bill seeks to change the existing law so that the Boston Elevated may be required to reduce fares before it has paid back to the communities any of the money which it advanced in the form of taxes to pay the deficit from operation. This company owes money to all the communities in which it operates and under the present law must pay it back before it can reduce its 10-cent fare.

Another proposition affecting the conduct of the Boston Elevated gives authority to this property to extend its service into the town of Revere, taking sections of the Eastern Massachusetts Street Railway by right of eminent domain if it cannot acquire such sections by agreement.

Other proposals include jitney regulatory measures, rules for the operation of one-man cars, establishment of transportation areas, and the establishment of an eight-hour day for all street railway employees. There are bills also which call for the abolition of the corporate franchise tax for the railways and a provision that they shall be taxed on their net income instead, and for exempting street railways from assessment to pay for the public improvements in street and bridges when ordered by the authorities and not required as improvements to the railways.

Looking to Big Things—Mitten's Idea of Success

Service Talks, published by the Philadelphia (Pa.) Rapid Transit Company, has reprinted in its March 4 issue the high spots of President Mitten's address of Feb. 28 to the members of the General Committees. "The Will to Bigger Things" should have a stimulating effect upon all the employees of the company who have been told from time to time the value of co-operating with the management.

In expressing his appreciation to the men for standing by him in this period of stress Mr. Mitten told the history of his coming to Philadelphia. He carried his story down to the recent controversy "which has given to the public a much better idea of what we are doing, and has strengthened us in many ways. It has established direct contact between the management and the stockholders, through the agency of the men in their appeal for proxies. We now feel that we are working for men and women whom we know and who know us; people who have a genuine interest in our efforts to serve them, who appreciate what we have done in the past and our aims for the future."

In urging the support of the P. R. T. stockholders, Mr. Mitten said:

> Think what it will mean to have these thousands of stockholders all actively pulling for P. R. T., constructively criticising when we fall short, and encouraging us when we do well! The influence of the brain and energy thus brought to our aid defies calculation.
>
> This entire situation is quite without precedent. I know of no other organization where the community interest between employee, management and owner promises so much. In this respect as in others, we are breaking into ground entirely new.
>
> We are going to do wonderful things, from now on, in showing what Men and Management, when unhampered, can do in getting results. Every man will do his utmost, not merely to help earn the co-operative wage dividend, but also to prove that co-operating labor, here in America, can beat the world.

Railway Business Improves When Competition Is Eliminated

Since the removal of bus competition in Muskegon, Mich., traffic on the lines of the Muskegon Traction & Lighting Company has increased and operating expenses are being met. This conclusion is arrived at after the submission of the January report on the first full month's operation since the elimination of competing bus lines.

In January 80,352 more passengers were carried than in December. Besides, the company paid its operating expenses realizing a net of $2,863. The report states that its earnings were not sufficient to meet interest charges, etc. The first report submitted seems to be in accord with the predictions of company officials at the time the question of bus competition was before the commission.

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All Positions Filled in Richmond

Strike There Is Over—Franchise and Other Matters Up for Consideration

The strike on the lines of the Virginia Railway & Power Company, Richmond, Va., is only technically on, the company having filled all positions and restored service on all lines. Advertisements for men have been withdrawn, and President Wheelwright states that the company now has a sufficient force and will not again return to domination by the Amalgamated Association.

Under government pressure the company at Richmond consented to the formation of the union during the war and the company regards the going back to a non-union basis as a distinct gain. On the other hand, the men in large numbers are running jitneys, several hundred autos in Richmond paralleling car lines and reaching to sections of the city not heretofore served with jitneys. This has caused a large falling off in the passenger receipts.

The city authorities in Richmond have done nothing to check the jitney, and will probably take no steps in regard to jitney regulation, the new general franchise, or the special franchise for trackless trolley lines until after the primary election for members of the City Council in April. Efforts of the company to secure from the Virginia Legislature a statute placing both jitneys and street cars under the State Corporation Commission as common carriers failed, under pressure of the localities seeking to retain home rule. A local bill passed allowing the city of Portsmouth to acquire and operate public utilities.

The strike never was serious in Petersburg and was settled amicably in Norfolk. There has been much feeling generated in Richmond and Portsmouth and in labor circles generally there is much opposition to any concessions being made to the company. At the same time that the City Council of Richmond was holding meetings to protest the wage cut of car men the new city budget was reported cutting the pay of city laborers to 38 cents an hour. This has met with little protest.

The power company has notified the city that it is not financially able to undertake its part of the paving program for this year in Richmond. The franchise requires the company to pave between its tracks and for 2 ft. on either side. The streets listed for paving this year would cost the company $250,000 including track renewals and paving. The company asserts it is unable to borrow this sum under present conditions.

Schenectady Wage Dispute Resurrected

Officials of the union of railway employees of the Schenectady (N. Y.) Railway have asked members of the arbitration board on the wage question which considered the dispute between the union and the railway last September to reconvene. They wish the board to decide if the previous award made by it was to have affected station masters, receivers and inspectors, and if the remainder of the award should not be paid.

Ouster Ordinance on Interurban Service Likely

Notice of the introduction of an ouster ordinance was given the City Council of Saginaw, Mich., on Feb. 28. If enacted the measure will call upon the Saginaw-Bay City Railway, now in the bankruptcy courts, and the receiver to remove all tracks and overhead construction from the streets of Saginaw. The action is in the nature of a showdown between the city on one side and the Saginaw-Bay City Railway and the Michigan Railroad, operating an interurban service between Saginaw and Flint, on the other, over the question of co-operating with the city in paving work, which members of the Council assert has been delayed several years because of the local company's poor financial condition. The dispute over this interurban service was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 18.

North Shore Goes After Milwaukee-New York Traffic

Starting on Feb. 15 the Chicago, North Shore & Milwaukee Railroad put on two more fast daily trains between Milwaukee and Chicago to make connections with the "Twentieth Century" and "Broadway Limited," the two famous twenty-hour trains between New York and Chicago. This new train is called the "Eastern Limited." It leaves Milwaukee and Chicago at 9:55 a.m. and arrives at the opposite terminal at 12:10 p.m., stopping only at Racine and Kenosha, Wis. Twentieth Century passengers are received or unloaded at the La Salle Street station of the elevated, from which there is a direct entrance into the La Salle Street station of the New York Central Railroad. Baggage is carried on the same train and transferred at the same place. Broadway Limited passengers are received and unloaded at the Quincy Street station of the elevated and taxis are provided for carrying the passengers the few blocks intervening between the Pennsylvania Railroad Station and the Quincy Street elevated station. In this case baggage has to be forwarded one train ahead of the Eastern Limited in order to be put on the Broadway Limited. The North Shore Line makes reservations for Milwaukee people on the New York trains, which are held for them until the North Shore train arrives in Chicago. These trains already give promise of paying well.

As a preliminary to the starting of the connecting service Twentieth Century trainmen and porters and La Salle Street Station "Red Caps" were taken over the North Shore Line on a special train and entertained, so that they can answer any questions about this service.

Chamber of Commerce Rebukes Commission's Critics

Rebuking certain critics of the State Railroad Commission in a number of recent decisions which, it is charged, those affected have endeavored to have reversed through methods of "popular clamor and political pressure," directors of the Los Angeles Chamber of Commerce on Feb. 28 went on record to the effect that litigants "should be prepared to abide by the decision of authority, or employ the method of review and appeal provided by law." A resolution was adopted denouncing the alleged effort to change the commission's decisions through unlawful means and a copy was mailed to Governor Stephens at Sacramento.

10 Per Cent Wage Cut Proposed in Cleveland

Notice of a 10 per cent reduction in pay for all motormen and conductors, effective May 1, has just been posted by the Cleveland (Ohio) Railway.

Under the new scale of wages the Cleveland platform men will receive 50 cents an hour instead of 55 cents an hour for men in service of the company less than three months; 53 cents an hour instead of 55 cents an hour for men in the service of the company less than one year, and 55 cents an hour instead of 60 cents an hour for men in the service of the company more than one year.

Officials of the men's union announce that they will oppose the effort of the company to reduce the pay.

According to Paul E. Wilson, secretary of the Cleveland Railway, the proposed reduction will mean a saving to the company of about $40,000 a month and insure a restoration of the 5-cent fare in Cleveland by midsummer.

Negotiations between the union and the company over the proposed reduction in wages will probably be begun about April 1.

Increased Pay Sought on Jersey Line

The employees of the Trenton & Mercer County Traction Corporation, Trenton, N. J., sent a petition to the company asking for an increase in wages after April 1, when the new agreement goes into effect, but the company replied with the announcement that the men would be expected to accept a reduction in pay of 5 and 6 cents an hour. The present maximum scale is 50 cents an hour, with 5 cents an hour extra for the one-man car operators.

The men also want some of the working conditions changed and complain about the three-shift system. They want pay for the men who have to report for work in the early morning, but who fail to obtain runs for the day. The employees claim that the company promised them higher wages when it secured the 8-cent fare, but failed to live up to this promise.

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Franchise Negotiations Renewed in Akron

In answer to a request made by the city for adequate service and extensions to the present lines, officials of the Northern Ohio Traction & Light Company, Akron, Ohio, at another conference expect to submit to the city a proposed fare for incorporation in the proposed flat rate franchise grant. The alternative in case the suggested fare is too high will then be to open negotiations looking to the service-at-cost franchise.

A. C. Blinn, vice-president of the company, announced that the fare in the flat fare grant would have to be sufficient to pay the operating expenses on the city system, provide for depreciation and taxes, and give the company a fair return on its investment. He asserted that the company, in a flat fare franchise, would have to make the fare high enough so that it would not suffer losses regardless of business conditions. The traction company, he said, can not speculate whether it is going to make or lose on the franchise, but must be sure that the rate allowed will pay expenses and earn a fair return on its investment.

Figures have been submitted recently by officials of the company showing that the cost of making seven rail extensions would amount to $1,892,024. The cost of making six bus extensions, and rail extensions on Rider Avenue together with the double tracking of East Exchange Street would approximate $500,000, according to the figures.

The company contemplates placing in service twenty-four motor buses on the extension lines specified by Council if a flat rate franchise is adopted. Three or four would be operated on all lines with the exception of the cross-town line by the way of Johnston Street it was said, on which line five buses would be operated.

New York State Men Prepare to Negotiate New Contract

Members of the local division of the Amalgamated at Rochester, N. Y., have voted to rescind their action in separating from the Utica and Syracuse divisions in the negotiations of an agreement to take the place of the existing contract with the New York State Railways. The agreement now in force expires on May 1. As a consequence of the action taken by the men, the Schenectady division will be included in the negotiations.

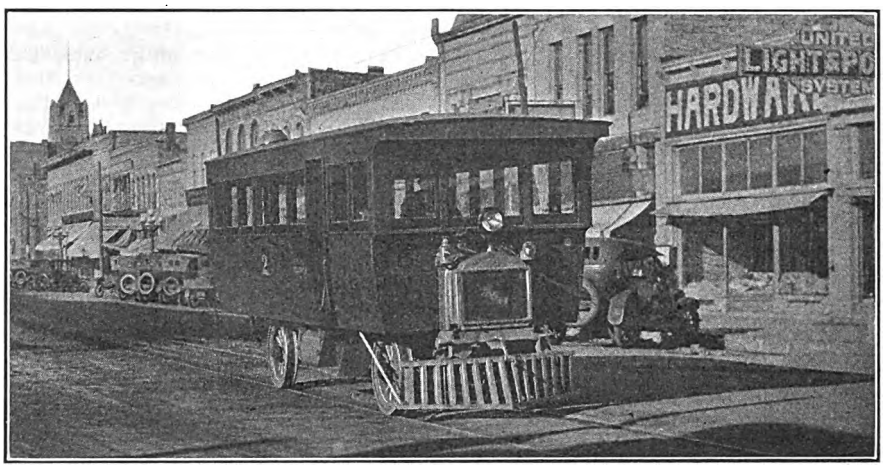
For several years the divisions in Rochester, Syracuse and Utica have conducted negotiations with the New York State Railways through a joint conference board, of which P. T. Noonan, Utica, is chairman. At the annual meeting of the Rochester division last December it was decided to conduct negotiations independently.

Syracuse and Utica invited the Schenectady division to join with them in the formation of a conference board and this invitation was accepted. Through the offices of the international union the Rochester division was asked to reconsider its action. This it did.

A committee made up of the presidents and business agents of each of the four locals has been appointed to conduct negotiations. Either side must notify the other of changes it wishes to make on or before April 1. William McGinn is president of the Syracuse division and Owen Lynch is business agent.

Self-Propelled Car Replaces Trolley

Manhattan, Kan., a town of approximately 10,000 inhabitants, is now enjoying transportation service furnished by self-propelled vehicles operated over rails. Manhattan had electric railway service for many years, but when the local power company rated its "juice" too high to please the interurban company, the railway decided to dispose of the electric cars and install a "fleet" of motor buses. The interurban company purchased six buses. In addition to serving the citizens of Manhattan, it has a track leading to Fort Riley and Junction City, and offers a service which is appreciated by patrons.



SELF-PROPELLED VEHICLE OPERATED ON RAILS

Manhattan is the home of the Kansas State Agricultural College, which means that first class service is required to please the large number of students who must make their classes on schedule. The accompanying illustration shows one of the buses on Poyntz Avenue, the town's principal thoroughfare.

The Manhattan City & Interurban Railway and its patrons are apparently well satisfied with the new service. The interurban cars are registering 300 miles a day, while the city cars average 190 miles a day. The new cars are said to be handling traffic at a cost of less than 15 cents per car mile.

Five gasoline railway cars have been purchased by the Interurban company. Four of these are used on the company's steel rails, while the other car has been equipped with 40 in. x 8 in. tires for use on the pavement between Manhattan and Fort Riley. This bus competes successfully with another transportation system. It connects with the Manhattan cars.

"Will they go through snow?" This was a question in the minds of Manhattan citizens when the new buses were installed. Snow didn't hinder them, as they successfully plowed through a 2-ft. layer of "traffic hinderer" without hesitation. In the new cars the load is equally distributed over the four wheels, which are all driving wheels.

The cars each have a seating capacity of thirty-two persons. They have high speed reverse gears which give as much speed in reverse as forward, locomotive type cow catchers and electric starting and lighting equipment. They are heated from the motor exhaust. The entrance and exit is near the front of the car with the door operated by the driver. The chassis of each bus weighs 7,200 lb. The attitude of the public toward the change has been expressed by a resident as follows:

> The worn out electric equipment has been sold and junked. The new cars give first-class service. This is the secret of their popularity. The town looks better since the trolley wires and poles were removed. Only half as many men are required to operate the new buses as was the case with the old cars. Cost of maintaining the right-of-way has been reduced to small proportions because the new buses are light in weight.

Mining Papers Merged

The McGraw-Hill Company has purchased the *Mining and Scientific Press* of San Francisco and on April 1 will consolidate it with the *Engineering and Mining Journal* under the name of *Engineering and Mining Journal-Press*. These two publications are the leading magazines of the metal mining industry, the *Journal* having been established in 1866 and the *Press* in 1860.

J. E. Spurr, editor of the *Journal*, will be editor of the combined weekly, while T. A. Rickard, editor of the *Press*, will be contributing editor, keeping his residence in San Francisco and representing, in particular, the Coast and Western viewpoints.

The combined publication will be issued in New York.

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Attack on Pennsylvania Commission Fails

Cases brought by the Borough of Edgewood, near Pittsburgh, to test the control of the Public Service Commission of Pennsylvania over electric railway companies, were in effect thrown out by the United States Supreme Court on March 6.

The suit was that of the Borough of Edgewood, vs. the Wilkinsburg & East Pittsburgh Street Railway and the Public Service Commission. The Borough of Edgewood contended that boroughs and municipalities can regulate electric railway fares in Pennsylvania under contracts made by them with the companies. The Scranton Street Railway was allowed to file a brief in this case, but was denied the right to participate in the oral argument.

Interurban Wages to Be Arbitrated

S. D. Hutchins, Columbus, Ohio, and C. S. Rich, Springfield, Ohio, arbiters in the wage dispute between the Indianapolis, Columbus & Eastern Traction Company and its trainmen, will meet in Springfield soon to attempt to draw up a satisfactory wage scale. The arbiters met in Springfield on March 2 for a preliminary conference at which time they went over the matters at issue but without coming to any conclusion. They met again on March 8 and as a result a third member will be chosen.

The wage contract under which the trainmen had been working expired on Feb. 15. It provided a rate of 49 cents an hour. When the contract expired the company proposed that the rate be cut to 45 cents. This proposal, however, was rejected by the men who insisted on retention of the 49-cent rate. After several conferences had failed to bring about an agreement both sides decided to leave the matter to a board of arbitration, one member to be selected by the company and the other by the traction employees.

St. Petersburg Wants Municipal Power Plant

The city of St. Petersburg (Fla.), has rejected the proffered contract for electrical power to run the municipal railway submitted by the St. Petersburg Lighting Company to replace the contract expiring Jan. 1, 1923. The city is planning to build its own electrical plant to supply power for city purposes. Later it may be extended for public service, but according to Public Utilities Director R. E. Ludwig, the present plans are for a plant to furnish the city's power only.

Mr. Ludwig says that the proffered prices are too high and that the conditions of the proposed contract are "too onerous." He recommended that the contract offer be rejected and after a committee of the City Commission had investigated and returned its report, Director Ludwig and the committee were authorized to tour the State and investigate all municipal plants as to initial cost, operating cost and other details. They are expected back and a decision will be made early in April. A petition containing the names of 2,000 citizens has been presented to the commission asking that a municipal plant be built if possible.

News Notes

Wants Electric Locomotives to Be Used.—Andrew P. Roman, assistant corporation counsel for the city of Buffalo has proposed a bill to be introduced at Albany, N. Y., compelling all railroads entering the city to use electric locomotives within the city.

Employees Notified of Probable Cut.—Wage reductions amounting to 20 per cent have been intimated in a bulletin issued to all employees of the Ottawa (Ont.) Electric Railway. It is said that the announcement will be made in April and that lower wages will become effective in May.

Denies Receivership Story.—According to a recent statement of L. M. Hobgood, president of the Fairburn & Atlanta Railway & Electric Company, Fairburn, Ga., his company is not in the hands of a receiver. In fact in his opinion the railway is one of the most prosperous in the State of Georgia. Press messages of late have announced the appointment of a receiver for the property.

Seeks Relief From Paving Expenses.—Assemblyman Everett of St. Lawrence County recently introduced a bill in the New York Legislature advocated by street railway companies which will save electric railways several millions of dollars annually. The proposition seeks to relieve the electric railway lines from paying the cost of maintaining the streets between the tracks and for 2 ft. on either side. The cost would be met by the taxpayers according to the Everett measure.

Veterans Receive Annuities.—Annuities were granted to twelve veteran employees of the Georgia Railway & Power Company, Atlanta, Ga., as a result of the first meeting of the annuities board. The most conspicuous veteran in point of length of service was Roland G. Thomas who had a service record of forty years. The plan of the railway in caring for its disabled employees was reviewed in the ELECTRIC RAILWAY JOURNAL issue of Jan. 28.

Boston "L" Takes Men Back.—According to an announcement of the Boston Street Carmen's Union many blue uniform men of the Boston (Mass.) Elevated Railway have been placed back at their former positions during the past two weeks. At a previous meeting of the union it was announced that more than 300 discharged employees had been taken back by the company. These men were among hundreds of employees laid off by the Boston Elevated in carrying out its economy plan.

Columbia Men Strike. — Service on the lines of the Columbia Railway, Gas & Electric Company, Columbia, S. C., has been suspended since Feb. 15 when the men went on strike following, it is said, the discharge of several employees. The president of the union of motormen and conductors has announced that the men will operate the cars pending settlement of the differences by a board of arbitration. F. H. Knox, president of the railway stated on Feb. 25 that no such offer of arbitration had been submitted to railway officials.

Can't Oust Railway.—According to a recent decision of the State Supreme Court the Northern Ohio Traction & Light Company, Akron, Ohio, is not denied its franchise rights to operate between Canton and Massillon. Ousting the railway was demanded by District Attorney Ruff of Stark County because the company had failed to start the work of double-tracking this line and had failed to pay any instalments which had been agreed upon. An agreement was made in 1919 when the company sought a franchise for a double track agreeing to pay $75,000 in three instalments.

Franchise Draft Waits on Information. — The matter of formulating a new franchise under which the Menominee Light & Traction Company, Menominee, Mich., will operate is being retarded. So reports the franchise committee appointed by the Mayor. The committee alleges that the traction company has not submitted the necessary information regarding expenses, earnings, investments, etc. The committee asks for further time to act and then to prepare a franchise draft from other available sources which if accepted by the traction company will be submitted to the voters at the spring election.

Wants Railway Service.—Following threats of the Indianapolis, Columbus and Eastern traction service to withdraw service on the branch line to London, Ohio, because the branch was being operated at a loss, petitions are being circulated in the town proposing a referendum on the question of granting the company an increase in rates sufficient to make up the deficit. When the matter was brought before the London Council some weeks ago, the company's request for an increase in rates was met with a flat refusal. An ultimatum was then issued by the company that unless the increase was granted in the near future, service on the line would be stopped and the tracks junked. Evidently the action of the council was not approved by the citizens generally for the referendum petitions are meeting with favor and it is anticipated that the increase will be granted.

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Financial and Corporate

New York Valuation Hearings March 20

The session of the New York Transit Commission several weeks ago at which the report of the bureau of valuations was received was adjourned until March 6 so as to permit the local railways to examine the report and its recommendations and to present their views on the matter. On March 6 the companies sought an adjournment and the hearing was put over until March 20. The valuation figures were summarized in the ELECTRIC RAILWAY JOURNAL for Feb. 25, page 333.

Counsel for the commission said on March 6 that considering the magnitude of the matter and the great detail in the valuation report four weeks was not an unreasonable time for the companies to have to study the report. In this the members of the commission acquiesced. Chairman McAneny said, however, that the necessity did exist of putting the commission as soon as possible in a position where it could proceed with the finalities of its plan. Judge Shearn for the commission then explained that it was his idea that all the companies ought to be ready to proceed on March 20 in the matter of any objections that go to principles that have been applied in the valuations, and that as soon as these objections—if there are any—have been disposed of the commission should proceed as it directed at the outset to take up the detailed objections of the Brooklyn Rapid Transit System and then follow down through the others in the order in which they appear in the appraisal.

After the matter had been settled of putting over further consideration of the valuation matter the commission proceeded to consider the general question of the character of service rendered by the different road. Some of the questions thus considered are reviewed elsewhere in this issue of the ELECTRIC RAILWAY JOURNAL.

Consolidation Prospects Bright in Spokane

The controversy between the city of Spokane, Wash., and the electric railways there has reached a point where the consolidation of the two companies has been agreed to and negotiations started with the city looking to an arrangement that will eliminate jitney competition. The controversy dates back to last June. At that time the railways secured authorization from the Public Service Commission to increase fares from 6 cents to 8 cents. The city retaliated by throwing the streets open to the jitneys.

With the high mark of daily traffic in the last several years running about 75,000 passengers, the jitneys, sixty-two of which operated last month, have taken nearly 30,000, leaving the street railways perhaps 40,000 to 45,000 passengers daily.

A plan of consolidation between the Washington Water Power lines and those of the Spokane & Eastern Railway & Power Company has been agreed upon between President D. L. Huntington of the Washington Water Power Company and M. H. McLean, Chicago, representing the bondholders of the latter company. The plan is to have a third company, the Spokane City Transportation Company, take over both city railway properties and do away with all parallel lines in the city.

It has been proposed to the city that a new franchise be issued to this company on the basis of a 7-cent fare and a universal transfer. The proposed new franchise would permit the company to withdraw from the business at the end of ten years and also to use motor buses, trolley buses or any other modern method of transportation in lieu of electric street cars.

The matter has just been presented to the City Council and there is no intimation as to the outcome. One thing is agreed even by city officials, namely, that the jitneys and street cars cannot both exist.

Income Bond Interest Declared Payable

The directors of the Third Avenue Railway, New York, N. Y., have authorized payment on April 1, 1922, of 1¼ per cent interest upon the 5 per cent adjustment bonds of the company. Interest on these bonds, which is payable semi-annually, has not been paid since June 30, 1917. President Huff said:

> With the reduction in cost of labor and material, surplus above paying interest on the underlying bonds has increased until, for the six months ended Dec. 31, 1921, full interest was earned upon the 5 per cent adjustment bonds. This was the first time for several years, however, that full interest had been earned for a six months' period and during the following month, January, 1922, full interest was not earned. Under these circumstances and in line with the conservatism that has always characterized the management of this property, the directors have deemed it inadvisable to pay more than 1¼ per cent interest for the period ended Dec. 31, 1921.

First Dividend in Forty Years!

The dividend announcements of the London underground electric railways for 1921 were made early in February. In many cases they show marked improvement over those for 1920. The most remarkable point is that there is a dividend of 1 per cent on Metropolitan District Railway ordinary stock. That stock has received no dividend since the year 1882, and then the rate was only ⅛ per cent. Presumably the increased fares are the cause of returning prosperity. The City & South London Railway and the London Electric Railway ordinary stocks get 3¼ per cent, or about double the dividends of a year ago. Central London Railway deferred gets 4 per cent, against nothing last year.

Profit Realized in Des Moines

For the first time in several years the Des Moines (Iowa) City Railway was able to show a profit during the month of January. According to the company's report filed with the city car supervisor traffic during the month resulted in a profit of $18,616. The total of revenue passengers carried during the month was 2,716,045, an average of 87,613 a day. Total revenues from all sources were $215,927. Against these receipts operating and depreciation charges amounted to $148,574. Tax charges were $15,000 and fixed charges amounted to $33,737. This makes a total for expenses of $197,311.

F. C. Chambers, general manager of the company, estimates that the Valley Junction bus competition cost the company $2,400 in profits during the month. January is the first month since the adoption of the new franchise where street cars had an entire month without competition in Des Moines from the buses. During the month service was restored to the pre-war basis.

Mr. Chambers has made study of the January fare figures which produces some interesting results as to the various charges which eat up the fare paid by the passenger. On account of the number of city policemen, firemen and charity workers who ride the cars without paying it has been figured that the average passenger revenue is 7.6 cents. Of this amount labor charges take by far the greatest proportion, namely 3.15 cents. Other charges are interest 1.16 cents, material 0.88 cent, depreciation, 0.64 cent, surplus, 0.65 cent, fuel, 0.58 cent, taxes, 0.54 cent. The item figured as surplus is the "cushion fund" provided in the recently adopted franchise to enable a reduction in fare when $150,000 has been created.

Indianapolis Dividend Deferred

The Indianapolis (Ind.) Street Railway has announced the passing of the regular quarterly dividend on the $5,000,000 preferred stock, which forms the underlying security of the system as it was reorganized when the Indianapolis Traction & Terminal Company ceased to operate it.

The notice to the preferred stockholders was as follows:

> After a careful examination of the company's present financial resources, the board of directors deem it advisable to defer the payment of the quarterly dividend due March 1, 1922.
>
> The urgent necessity of an increase in revenue in order that the company may meet its obligations, including the dividends on the preferred stock, and make necessary improvements is again being presented to the public officials and it is hoped that the justice of the company's claim will be recognized so that the payment of dividends may be resumed as speedily as possible.

This notice to preferred stockholders discloses that in the presentation to city officials of data concerning the company recently the company officials emphasized the need for the city so to modify the terms under which the company operates that it may give service at a profit in the future.

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Deferred Payment Plan Suggested in San Francisco

An amendment to the city charter will have to be voted by the people before the city of San Francisco, Cal., can purchase the entire rights and properties of the Market Street Railway. This is the opinion of City Attorney George Lull. Conferences are now being held looking toward the purchase. Mr. Lull is reported to have said:

> The charter permits us to purchase outside the city for water rights, but not for street car rights. The line running from San Francisco to San Mateo city is a big money earner for the company and is included in all the estimates of the $40,000,000 valuation made by City Engineer M. M. O'Shaughnessy. If the voters want to purchase the system, in my opinion, they will not wish to leave out the line that makes the most money.

Mr. Lull said the Market Street Railway offered a method of purchase at a conference on Feb. 27 on a split basis—that is, the city vote $14,000,000 in municipal bonds and make the rest of the payments for the system out of the revenue of the line on the installment plan. The city bonds would be negotiated to take care of the $14,000,000 bond issue made by the company, which becomes due in 1924.

Purchase of Railway Proposed

The directors of the Chamber of Commerce of Valdosta, Ga., have indorsed a plan whereby the residents and business interests of the city will buy the Valdosta Street Railway and operate it. It was suggested that a committee should be formed looking toward the organization of a holding company for the property and that stock should be bought by as many people as possible.

Since the rehabilitation of the property the line is going well though not in the way of an investment. The present owner of the line has spent considerable money in putting tracks, wires and equipment in good condition so it was pointed out to the directors that it could be considered a sound business proposition.

E. W. Clark Reports Summarized

Reports of the corporations under the E. W. Clark management, Philadelphia, Pa., for the year ended Dec. 31, 1921, have been submitted. Among the companies reporting are the Commonwealth Power, Railway & Light Company System, Bangor Railway & Electric Company, Nashville Railway & Light Company, East St. Louis & Suburban Company System, Portland Railway, Light & Power and the Cumberland County Power & Light Company.

The Commonwealth Power, Railway & Light Company, controlling properties in the central west, shows a balance of $1,838,768 against $797,738 a year ago. It is noted that in its report for 1920 this company showed a 40 per cent decrease in balance whereas in 1921 the increase amounted to more than 130 per cent.

The most appreciable increase in balance available for depreciation, renewals, etc., was shown in the report of the Nashville Railway & Light Company, where an increase of 200 per cent is seen in the balance. The statements of operations for the above mentioned properties are reproduced herewith.

Outlook in Findlay Brighter

Edward Goepper, president of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, told the stockholders at the annual meeting that "the outlook is now much better for a gradual return to more normal conditions within a reasonable time."

He said that the company had held its own during the last year of depression without increasing its floating debt. He said further that an adverse factor that has seriously affected receipts of all interurban lines was the constantly increasing use of the automobile as a means of conveyance for both passengers and freight. Enactment of legislation placing such motor vehicles operating for profit under state regulations as are all the railways, was urged.

In discussing the service-at-cost franchise put in effect on the city lines here last March, President Goepper said that despite deficits that had been experienced the company sees a possibility of the system finally proving a success.

Seeks to Equalize Revenues.—To equalize the revenues of the street railways in the District of Columbia, due to the fact that the present rate of fare yields a greater return to the Capital Traction Company than to the Washington Railway and Electric Company, the Senate committee on District of Columbia is considering a proposal of the Local Public Utilities Commission to tax revenues between 6 and 7 per cent at the rate of 50 per cent and in excess of 7 per cent at the rate of 75 per cent.

	Commonwealth Power, Railway & Light Company			Bangor Railway & Electric Company			Nashville Railway & Light Company		
	1921	1920	Increase Per Cent	1921	1920	Increase Per Cent	1921	1920	Increase Per Cent
Gross earnings	$31,309,259	$31,285,981	0.1	$1,420,471	$1,262,779	12.5	$3,857,852	$3,675,209	5.0
Operating expenses and taxes	20,865,452	22,390,298	6.8*	†877,213	800,777	9.5	†2,976,632	2,979,332	0.1*
Net earnings	$10,443,807	$8,895,683	17.4	$543,258	$462,002	17.6	$881,220	$695,877	26.6
Interest, etc.	7,527,859	7,020,765	7.2	282,286	263,707	7.0	471,082	479,326	1.7*
Balance	$2,915,948	$1,874,918	55.5	$260,972	$198,295	31.6	$410,138	$216,551	89.4
Pfd. stock div.	1,077,180	1,077,180	.....	108,174	105,000	3.0	125,000	125,000	.....
Balance	$1,838,768	$797,738	130.5	$152,798	$93,295	63.8	$285,138	$91,551	211.5

(Available for renewals, depreciation, financial requirements of companies and dividends on common stock.)
*Decrease.
Note: Dividends on preferred stock accumulated, but unpaid since Feb. 1, 1921.

(Available for financial requirements of company and dividends on common stock.)
†In December, 1921, $29,291; December, 1920, $8,905; twelve months, 1921, $100,647; twelve months, 1920, $66,742 included for depreciation.

(Available for renewals, depreciation, financial requirements of company and dividends on common stock.)
*Decrease.
†In December, 1921, $20,754; December, 1920, $3,000; twelve months, 1921, $186,228; twelve months, 1920, $36,000 included for depreciation.

	East St. Louis & Suburban Company System			Portland (Ore.) Railway, Light & Power Company			Cumberland County (Me.) Power & Light Company		
	1921	1920	Increase Per Cent	1921	1920	Increase Per Cent	1921	1920	Increase Per Cent
Gross earnings	$3,818,302	$4,368,922	12.6*	$9,922,242	$9,564,615	3.7	$3,305,110	$3,114,008	6.1
†Operating expenses and taxes	2,977,429	3,322,699	10.4*	†6,992,326	6,676,157	4.7	†2,242,835	2,142,835	4.7
Net earnings	$840,873	$1,046,223	19.6*	$2,929,916	$2,888,458	1.4	$1,062,275	$971,173	9.4
Interest, etc.	654,385	647,272	1.1	2,107,733	2,101,615	.3	697,876	667,483	4.6
Surplus	$186,488	$398,951	53.3*	$822,183	$786,843	4.5	$364,399	$303,690	20.0

(Available for financial requirements of companies and dividends.)
*Decrease.
†Included for depreciation, December, 1921, $26,170; December, 1920, $17,369; twelve months, 1921, $330,919; twelve months, 1920, $359,417.

(Available for financial requirements of company and dividends.)
†In December, 1921 and 1920, $59,782; twelve months, 1921, $717,386; twelve months, 1920, $642,002 included for depreciation.

(Available for financial requirements of company and dividends.)
†In December, 1921 and 1920, $17,568; twelve months, 1921, $215,220; twelve months, 1920, $210,820 included for depreciation.
Note: One year's back dividends on the preferred stock were paid in February, 1921. In May, 1921, regular quarterly dividends were resumed. There remain unpaid back dividends amounting to $241,500.

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$13,400,000 New Financing at Atlanta

Plans matured by the officers of the Georgia Railway & Power Company, Atlanta, Ga., over a period of a year past provide for the raising of $13,400,000 to be applied as follows:

To pay the floating indebtedness mainly due to losses of the past four years, about	$5,000,000
To complete (now about 50 per cent finished) the 80,000-hp. Tugaloo hydro-electric development, about	2,000,000
To increase to 22,500-hp. (50 per cent increase) the capacity of Morgan Falls water power development, about	400,000
To provide increased service and facilities for customers in the electric and gas departments and street car service, about	2,000,000
In addition to the above it is estimated that during the next five years the demand for power will require additional high-tension transmission lines, costing about	2,000,000
These plans provide also for the construction of Mathis-Tallulah, Seed and Burton developments on the Tallulah River, all between the present development and Burton storage reservoir, using stored water successively, costing approximately	2,000,000
Total new cash capital needed to complete the plan	$13,400,000

Harry M. Atkinson, chairman of the board, explains as follows:

To carry out these plans, this $13,400,000 will have to be borrowed in the money market and expended in making these developments in Georgia and for the use of the public.

One great benefit under this plan will be that the waters of the Tallulah River will be used successively five times, where they are now used only once.

These developments will put the company in position to continue furnishing Atlanta and north Georgia continuous, efficient, dependable water power service at reasonable rates and will contribute more to the development and upbuilding of this city and section than any other one thing that could possibly come to it.

These plans are not merely on paper, but the financing has actually been done, subject only to the earning power of the company proving sufficient under the established rules of the money market to enable the company to borrow this sum. As a first step the mortgage has been prepared and has been submitted to and approved by the Railroad Commission, and the money has been secured subject alone to the security proving satisfactory.

The established rule of the money market requires earning power of a company like this of twice the amount of its fixed charges and interest and under the present rates allowed to be charged by the company only $4,000,000 of this needed total sum can be secured at this time.

$11,513 Net Income in London, Canada

In its annual statement for 1921 the London (Ont.) Street Railway reports an increase in its gross earnings over 1920 of $43,138 but with an increase in operating expenses of $32,787. Wages which were included in operating expenses amounted to $351,476, an increase of more than $22,000 over the previous year. Net earnings from operation amounted to $80,522. After deductions of fixed charges and depreciation the net income realized was $11,513.

President Currie's report makes mention of the difficulty experienced in operating the railway "at the extremely low rate of fare of seven regular tickets for a quarter, and nine limited tickets for a quarter, during certain hours of the day." He further admits the company's inability to finance the purchase of necessary new equipment.

Lafayette Road Sold for $201,300

The street railway system at Lafayette, Ind., was offered for sale on March 1, by Charles Martindale, Indianapolis, master in chancery. The track and the carhouse were purchased by Julius Berlovitz for $75,000. Mr. Berlovitz stated after the sale that if the proper co-operation is extended by the city and West Lafayette authorities the system in Lafayette will be continued and the property rehabilitated.

The South Street power station, owned by the Lafayette Service Corporation, was sold to the Northern Indiana Gas & Electric Company. Emmett Mulholland, representing that company, was the only bidder. The sale price was $120,000.

The street railway, it is announced, will continue to operate for the next thirty days under the present receivership.

Mrs. John S. Morrison, secretary of the board of trustees of the Indiana State Soldiers' Home, purchased the Tecumseh Trail property for a state park in connection with the Soldiers' Home grounds. Her bid was $6,310.

There were no bids on the company's property as a whole.

All sales were made by Mr. Martindale subject to the approval of Judge A. B. Anderson in the United States district court at Indianapolis. The sale was ordered on petition of the bondholders of the Lafayette Service Corporation, who applied in the federal court for a receiver and foreclosure of their mortgage.

Mr. Berlovitz stated that he hoped to form a company of Lafayette citizens to take over and operate the railway. The tentative plan is to eliminate a few short stretches of unproductive track, if it is deemed advisable. The city and West Lafayette authorities will be asked to give the company proper protection by elimination of competition from jitneys. If this is done, it was stated, the company will proceed at once to rehabilitate the lines with new cars, the tracks will be put in proper repair and the line up Main Street hill will be relaid and cars put in operation.

Judge Anderson did not order the property appraised, but fixed an order that the railway and the carhouse which were purchased by Mr. Berlovitz, could not be sold for less than $65,000; the power plant purchased by the Northern Indiana Gas & Electric Company for $120,000, to be sold for not less than $95,000, and the Trail property, purchased by the trustees of the Soldiers' Home for $6,310, to be sold for not less than $6,000. The total amount realized from the property was $201,300, while the total indebtedness against the property is $225,000.

Pittsburgh Railways Nets $162,989

The Pittsburgh (Pa.) Railways finished the year 1921 with a surplus of $162,989, whereas in 1920 it showed a deficit of $910,057. The year's operating figures are contained in the report of the receivers, filed with the United States Court.

Though the total of 311,863,881 passengers for 1921 is 11,255,479 below the number for 1920, the increased fare allowed the company to enlarge its operating revenue by $218,709. Daily receipts, which in January were $61,666, were only $56,839 in December. This is a decrease of $4,827 a day.

	1921	1920
Operating revenue	$21,541,312	$21,322,503
Operating expenses and taxes	17,661,992	18,754,795
Operating income	$3,879,319	$2,567,707
Non-operating income	190,631	172,292
Gross income	$4,069,951	$2,739,999
Fixed charges	3,720,463	3,424,498
Receivers' net income, Surplus	$349,488	.....
Deficit	.....	$684,498
Less verdicts, settlements, pre-receivership damage claims	186,498	225,588
Net income, surplus	$162,989	.....
Deficit	.....	$910,057

The company increased its car mileage from 37,586,235 miles in 1920 to 37,974,664, though passenger travel decreased.

Chief items in the expenditures, including $90,000 receivership fees, were semi-monthly wages motormen and conductors and others, $10,203,220.28; monthly salaries, $694,389.82, and repairs to tracks and equipment $313,131.92. The financial showing for 1921, compared with 1920, as disclosed in the report of the receivers, is shown in table above.

Application Made for Permission to Abandon Line

Application was filed on March 6 with the Ohio Public Utilties Commission by the Springfield & Washington Railway, operating between Springfield and South Charleston, Ohio, for authority to abandon service on the line. The application was set for hearing by the commission for April 14.

Notice that such application would be filed was given some time ago by Floyd Baker, one of the owners, who said that since the Springfield manufacturing and wholesale concerns had been using their own motor trucks for delivery to South Charleston, the line had been operating at a loss. A committee of citizens from South Charleston and Springfield are now attempting to form a company to take over the line.

The line was originally intended to extend from Springfield to Washington Courthouse, Ohio, but when the right-of-way had been extended to South Charleston, the company ran out of funds and the line was never extended any farther.

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Receiver Appointed for Pennsylvania Property

On application of the First National Bank, Bangor, Pa., which alleges that the Slate Belt Transit Company, Pen Argyl, Pa., has an indebtedness of $23,000, the Northampton County Court has appointed Oscar J. Mutchler receiver for the company. The transit company did not oppose the receivership. The court has also appointed George Rasely, Mount Bethel, and Henry A. Male, Pen Argyl, appraisers.

The Slate Belt Transit Company has been operating in the slate regions since 1900 and maintains lines between Bangor, Pen Argyl, Wind Gap and Belfast. Joseph Hambleton, for many years president of the company, has been appointed manager by Receiver Mutchler. The latter has been authorized to carry on the business of the company and operate the line.

Cambridge Subway Deal Will Pay for Repair Shop

Proceeds of the sale of the Cambridge Subway will finance the big repair shop at Everett which is being planned by the Boston (Mass.) Elevated Railway. The Boston property received $7,868,000 for the tube between Boston and Cambridge. Some $4,500,000 of this sum has already been used to pay off maturing bonds, which it was not deemed expedient to attempt to refund under then prevailing bond market conditions. The road's treasury is, however, entitled to be reimbursed for this $4,500,000 and when it is decided that a good time has arrived the railway will arrange this postponed refunding operation and in that way secure funds for this construction.

Financial News Notes

Reorganized Company Pays Dividend.—The directors of the Market Street Railway, San Francisco, Cal., have declared a dividend of $1.50 a share on the prior preference stock applicable to the quarter ending March 31, payable April 1, to stock of record March 15.

Bankers Offer Public Service Stock.—Bonbright & Company, New York, N. Y., are offering $3,700,000 of 8 per cent cumulative preferred stock of the Public Service Corporation of New Jersey. The price per share is $100 and accrued dividends. This is the same issue of which more than $1,000,000 has been subscribed by the company's patrons.

More Collateral to Be Sold.—A notice has been issued to holders of securities pledged under collateral trust agreement of the Memphis (Tenn.) Street Railway dated Nov. 1, 1917, securing two-year 6 per cent collateral gold notes that the trustee will offer for sale at public auction at New York on March 15 all securities pledged under the collateral trust agreement.

Earnings Better at Pine Bluff.—The Pine Bluff (Ark.) Company reports for the twelve months ended Jan. 31, last, gross earnings of $788,812, contrasted with $773,363 the preceding year and a surplus after preferred dividends of $127,312, against $93,498. In January the company's gross was $66,957, compared with $68,185 in the same month of 1921 and a surplus after preferred dividends of $12,469, compared with $11,768 last year.

$865,000 Bonds Offered.—Harvey Fisk & Sons, Inc., New York, N. Y., and Cassatt & Company, Philadelphia, Pa., are offering $865,000 of the Darby, Media & Chester Street Railway's first mortgage 4½ per cent Gold Bonds. This property is part of the Philadelphia Rapid Transit System, which has guaranteed the bonds as to principal and interest. The bonds are offered at 81½ and accrued interest to yield more than 6½ per cent. They are dated July 1, 1906 and are due July 1, 1936. The offering was quickly oversubscribed.

Presentation of Valuation Case Concluded by Company.—Coleman J. Joyce, counsel for the Philadelphia (Pa.) Rapid Transit Company, announced on March 1 at a valuation hearing before Public Service Commissioner Clement that his side in the valuation proceedings has finished the giving of direct testimony. Mr. Joyce said he had no more testimony to bring before the commission, but would submit some financial data having a bearing on the matter. Assistant City Solicitor Samuel Rosenbaum, representing the city in the proceedings, informed Commissioner Clement that his side desired a month's time in which to prepare a report to be submitted to the commission.

Reclassification of Stock Proposed.—A special meeting of the stockholders of the United Gas & Electric Company, New York, N. Y., a subsidiary of the United Gas & Electric Corporation, was called for March 6, to ratify action of the board of directors in reclassifying the present common stock. At present the company has 26,210 shares of common, par $100, outstanding. It is proposed to change this into an equal number of shares having no par value. The 3,790 shares of common remaining unissued after the exchange the company will reserve for issuance at such prices as the directors may determine, subject to approval of at least two-thirds of the common stockholders.

Fewer Passengers in Richmond.—In response to a request from the street committee of the Council of Richmond, Va., President Thomas S. Wheelwright recently forwarded to that body a statement of the number of passengers transported over the lines of the Virginia Railway & Power Company in Richmond during the years 1920 and 1921, in which it was shown that there was a decrease in 1921 over the previous year of 3,774,831 passengers hauled in the city of Richmond alone. The figures were: 1920, 46,611,097; 1921, 42,836,266. So far this year, the figures are far below those of the previous periods. This statement was filed for reference when the committee begins its work of framing a franchise.

Plea Made to Discontinue Local Service.—Informing the City Council of Bellefontaine, Ohio, that the city service maintained over the traction lines in that city was a continually losing proposition, F. A. Healy, general manager of the Indianapolis, Columbus & Eastern Traction Company, has applied to the Council for permission to discontinue the service. The franchise under which the company operates, has eleven years to run. The company offered to stop all limited as well as local interurban cars at each street intersection if permitted to remove the local car. No definite action has yet been taken by the Council, but a canvass of the members indicates that the request will be opposed by a majority if it is brought up for a vote, the Councilman contending that the land along the right-of-way has been built up because the home owners expected continued city service.

Bonds Authorized to Provide for Improvements.—A bond issue of $195,000 authorized by the Railroad & Public Utilties Commission for the Knoxville Railway & Light Company, Knoxville, Tenn., will be sold to create funds with which to finance the building of the new substation now in progress of erection at the power house on Sixth Avenue. This was announced by Col. C. H. Harvey, president of the company. The new substation will cost approximately $220,000, although no exact figures can be arrived at until the work is complete. Col. Harvey explained that the charter of the company allows it to issue and sell bonds to the extent of 80 per cent of expenditures for improvements. The $195,000 to be issued and sold will be 80 per cent of the amount that will have been expended when the present improvements are completed.

Authority Sought to Issue Refunding Bonds.—The Northern Ohio Traction & Light Company, Akron, Ohio, has asked the Ohio Public Utilities Commission for authority to issue and sell $1,225,000 first lien and refunding mortgage 7 per cent gold bonds, proceeds to be used in payment of $1,145,000 Canton-Akron Railway bonds due March 1, 1922. In requesting the 7 per cent rate, the company held that prevailing market conditions necessitated the paying of higher interest at this time on traction securities. An issue on $1,145,000 of first and refunding mortgage 5 per cent gold bonds originally was authorized by the commission July 21, 1916, to pay for the acquisition and redemption of first mortgage bonds of the Canton-Akron Railway, which is part of Northern Ohio Traction & Light Company's system, and on May 6, 1919, the commission authorized an issue of $80,000 in bonds, dated Aug. 1, 1916, to reimburse the company's treasury for capital expenditures.

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Traffic and Transportation

Fares in Springfield

Bus Competition Removed in Ohio City, but Revenue Still a Problem—Pass Being Talked

Although agitation has been started for a reduction in fares by the Springfield (Ohio) Railway, it is more than likely that the 7-cent rate will be continued for some time to come at least.

This is indicated by the monthly reports filed with the city manager, which continue to show a deficit with no relief in sight. The reports are filed with the city under the terms of an ordinance passed some months ago granting an increase in the fare from 5 to 7 cents with free transfers.

Buses Increase Company's Financial Embarrassment

According to the report for the month of January, filed March 1 with the city, the company sustained a loss of $5,704. This sum does not include accrued dividends due on the company's preferred stock, amounting to $2,500.

The report shows that 766,351 passengers were carried during the month. Gross income for the month was placed at $49,837. Expenditures charged against this included: Operating expense, $40,034; taxes, $3,667; interest on funded debt and other fixed charges, $10,639; monthly installment of street improvement assessments for 1922, $1,199.

The critical financial situation faced by the company was rendered more acute last fall when bus lines were established along routes followed by the company's cars. As the buses began operating practically overnight, there was no regulatory ordinance to govern them. Complaint was voiced by the railway when the bus operators began running their machines just ahead of the street cars and picking up persons along the way who otherwise would have ridden on the cars. These were attracted to ride in the buses, first, because the bus arrived before the car, and, second, because the buses charged a 5-cent fare whereas the railway fare was 7 cents. The railway charged that this was manifestly unfair competition.

Ordinance Provisions Made Against Buses

Continued demand for some action resulted in the adoption on Jan. 9, 1922, of a bus regulatory ordinance, passed as an emergency measure. Because the terms of the ordinance were so drastic, however, the buses were allowed a period of thirty days to comply with its provisions.

The most drastic provision in the ordinance was the one barring the buses from the routes followed by street cars. Another provision considered onerous by the bus operators was the one requiring indemnity bonds to be furnished by the operators to cover legal damages assessed for possible accidents occurring to passengers or others as the result of the bus drivers' alleged negligence. It was specifically stated, however, that the amount of the bond was not to represent the limit of the operator's liability should the courts allow a larger award than the amount of the bond. These bonds ranged from $1,000 for machines having a carrying capacity of not more than six persons to $20,000 for machines whose seating capacity exceeded sixteen persons.

Annual license fees were also provided. These were $10 for all machines whose seating capacity was fifteen or less, $150 for each bus whose seating capacity was sixteen to twenty-five passengers and $250 for all buses having a seating capacity exceeding twenty-five persons.

Other provisions included in the ordinance required buses to be operated on regular schedules, be subject to inspection without notice by city officials, requiring the display of route signs in a prominent place on the front and sides of the machines, prohibiting the carrying of an excess of more than 25 per cent of the rated seating capacity, forbidding the collection of fares while the bus is in operation, requiring tire chains and fire extinguishers to be carried, requiring them to stop on the far side of streets to take on and discharge passengers, requiring two exists, one to be at the rear of the machine, and specifying lighting systems.

Bus Lines Quit

Few of the bus lines continued in business after the period of grace for the ordinance had expired. The operators at first decided to carry the battle into court to test the legality of the ordinance, but changed their minds, some of them removing their buses to other cities. In two cases, however, where bus service was continued, the owners made test trips over the prohibited routes. Their arrest followed and every preparation was made to carry the fight to the Supreme Court when it was discovered that there was a flaw in the original warrants which caused the cases to be thrown out of court. Since that time those bus operators which have continued service have made no effort to attack the terms of the ordinance.

This regulation of the buses helped the railway in doing away with unfair competition, but the deficit in the earnings of the railway still continues, with both city officials and company officers attempting to find a satisfactory solution. At the present moment the weekly "pass" system is being considered, but whether this will be adopted remains to be seen.

Decision From State Supreme Court Expected

The State Supreme Court is expected to reach a decision on March 15 in the controversy between the State of Louisiana and the City of New Orleans. In this contest the state disputes the authority of the city, through its Commission Council, to negotiate with the New Orleans Railway & Light Company on rates of fare, gas, electric light and other matters affecting the public utilities of the city. The case was argued at great length before the full court of nine judges, this being the first case in the history of the state to come before the court since its personnel was increased from seven to nine judges.

It is anticipated that the court in its forthcoming opinion will take up all phases of the car tangle and will once and for all, in a comprehensive decision, settle the matter of the 5-cent fare litigation.

The argument in the case was opened by the state's Attorney General Coco, who contended that the rate-making authority was vested in the Public Service Commission, under the Constitution of 1921, while City Attorney Kittredge and H. G. Dufour, representing the railways, maintained that the Legislative acts of 1912 granted the City of New Orleans the right to fix fares and other rates.

46,608,899 Pay Fares at Times Square Stations

The Times Square stations of the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company handled the most passengers during 1921 of any of the stations of the New York companies. Figures which the Transit Commission has compiled show that 46,608,899 persons paid fares at these two stations. Experts say that fully as many persons leave the trains as board them at these stations, which makes a total of 93,217,798 persons passing through the stations, or an average of 182,788 daily. The Interborough station at Times Square handled 1,413,188 more persons than did the station at Grand Central, while the Times Square station of the Brooklyn Rapid Transit handled 2,157,860 more persons than the Union Square station, its nearest competitor.

At Times Square in 1921, 30,400,905 passengers took Interborough trains, and 16,207,994 boarded cars of the Brooklyn company.

Increased Rates in Effect

The Toledo, Bowling Green & Southern Traction Company recently increased the rates of fare between Bowling Green and Toledo, Ohio. The new fare to Toledo is 50 cents one way and 90 cents round trip. This represents an increase of 10 cents one way and 14 cents round trip. The fare to Maumee has been increased 5 cents one way and 10 cents round trip.

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Service Standards to Be Promulgated

New York Commission Developing Plans for Requiring Increased Service Based on the Improved Financial Ability of the Companies to Increase Facilities

The question of the adequacy of service furnished by the railways in New York City is now before the New York Transit Commission for consideration. The commission announced at the session several weeks ago at which the valuation figures were presented that it was prepared to go into the general question of the character of the service rendered. After postponing on March 6 further consideration of the valuation details it did proceed on that day to inquire into the adequacy of service.

CHAIRMAN McANENY explained that the question of service was taken up for the double purpose of securing the entry and enforcement of orders improving service as rapidly as possible in view of the improved financial condition of the roads and also in order that the railways, at the time the commission is concluding its examination of the valuations, shall appreciate how the service in the future will affect their costs.

HIGH STANDARDS TO BE EXACTED

The chairman emphasized the point that the commission was not introducing this general subject at this time as a threat of any pressure to be brought against the companies while the commission was considering these matters. On the contrary, the improvement of the service of the roads is and has been a prime consideration from the beginning. Conditions were improving with the companies and the commission desired it understood that the highest standards of operating service were going to be exacted. Mr. McAneny said:

"While we are bent upon a reorganization of the system that will improve its physical condition and that will be susceptible of extension at the same time we are bent upon securing the best kinds of train and car service that the lines can give."

With that object in view two or three months ago the several bureaus of the commission were instructed to work in co-operation in perfecting their observations of actual traffic and of preparing a standard set of operating principles toward which the companies would be expected to move as rapidly as their means might permit.

MR. TURNER DESCRIBES OVERCROWDING

Mr. Shearn, counsel for the commission, called as the first witness Fred W. Lindars. He was questioned at considerable length with respect to the recent financial showing of the various companies. Mr. Lindars was followed as a witness by Daniel L. Turner. He said that in connection with the valuation work a large number of observations had been made on the various lines, subway, surface and elevated. While that work was carried on men under him had been co-operating with Mr. Turner in considering proper standards of service that might be put into operation if the city could have the benefit of the economies contemplated in the adjustment plan.

Observations and reports made by Mr. Turner were then introduced into the evidence. He was examined with respect to some of these so as to establish the method of procedure in compiling the report. Mr. Turner testified to an overload of 247 per cent in the subway at the peak of the rush-hour traffic and an overload of 2 per cent at the time of minimum traffic. In other words nearly 250 people were crowded into a car with a seating capacity of fifty. During the rush the variation of headway was from 1 minute and 40 seconds to 4 minutes. Traffic varied in the number of cars from 120 during a twenty-minute period to forty-four cars during a twenty minute period.

Mr. Turner said that there was no operating reason why the local service interval could not be maintained at the most at two minutes and thirty-seven seconds whereas it was maintained on a five-minute interval. The underlying motive at the bottom of the company's policy was to make a profit. On the other hand, the primary consideration of the passengers is to secure adequate and proper service.

A RUNNING FIGHT IN INTEREST OF PASSENGERS

Mr. Turner said it has been one continuous struggle to enforce proper service by the operating companies. Counsel for the commission thought that that body would be warranted in instituting service orders. Chairman McAneny said that the point had been reached where the commission would be justified in taking much stronger measures than have been possible in the immediate past; in the first place, toward getting back to interrupted standards and then in setting up standards for the future.

Mr. Turner stated for the record what in his view and that of his associates should be the principles that ought to control proper standards of service for the various transit lines under the plan that the commission proposes. These are summarized as follows:

1. That on rapid transit lines frequent train service must be the fundamental principle. This may mean that during the middle of the day the headway on the trunk lines must be reduced to two minutes, and possibly to even less under some conditions.
2. That the amount of service on rapid transit lines must be made to respond to the traffic demand by varying the number of cars in the trains, rather than by changing the headway between trains.
3. That the service provided over the trunk lines, or through the line controlling points, must be distributed over the branches of the rapid transit lines in proportion to the traffic on such branches.
4. That during the rush hours, the express and local service in one or both directions, as the traffic requires, past the maximum load point during every twenty-minute period must be the maximum that the line capacity will permit, the headway between trains must be the shortest possible, and the number of cars in the trains the maximum possible.
5. That, during the non-rush hours, on the express and local trains, in one or both directions, as the traffic requires, seats for all passengers must be provided during every twenty-minute period past the maximum load point, the headway remaining as nearly constant as practicable at the specified minimum headway and the number of cars in the trains varying with the traffic.
6. That during the period immediately preceding the rush hours, as traffic increases, the service must be increased, on a seat per passenger basis, by adding cars to the trains and shortening the headway, until the maximum service is equalled. Similarly, at the end of the rush hour, the service must not be reduced by taking off cars too soon.
7. That, therefore, on the rapid transit lines, the adoption of the preceding principles means generally that on every day, during all hours of the day, rush hours, mid-day and night, either seats or the maximum service that the line capacity will permit must be provided during every twenty-minute period.
8. That on the surface lines, during the rush hours, the headway between cars must not exceed ten minutes and the minimum headway the line capacity will permit, depending upon the traffic and the overloading permitted.
9. That on the surface lines during the rush hours a certain amount of overloading, or excess of passengers over seats may be permitted during each twenty-minute period, past the maximum load point in one or both directions as the traffic may require the permissible overload will be specified for each line, depending upon the characteristics of the traffic service and equipment on such line, and the limitation of track capacity. Except where track capacity is the limiting factor, such overloads must not exceed a 50 per cent excess of passengers over seats. If the headway between cars is ten minutes a seat per passenger, service must be provided. The permissible overloading may vary between these limits, as determined by the commission, depending upon the type of car and headway being operated.
10. That on the surface lines during the non-rush hours, in no case should the headway be greater than ten minutes in the middle of the day between the morning and night rush hours.
11. That also during the non-rush hours, on the surface lines, a sufficient number of cars should be operated to provide a seat for every passenger during every twenty-minute period in one or both directions, as the traffic may require, past the maximum load point.
12. That during the period immediately preceding the rush hours, as traffic increases, cars must be put into service on a seat per passenger basis, until the number of cars in operation equals that required for the rush hours.
13. That similarly, at the end of the rush hours, the number of cars shall not be reduced until the traffic has fallen to a point providing a seat for each passenger, after which the service may be stepped down in accordance with this standard.
14. That during all hours of the day the car movement must be speeded up to the maximum possible and regular headways must be maintained.
15. That, therefore, on the surface lines, the foregoing principles mean generally that during all hours of the day, rush hours, mid-day and night, either seats during every twenty-minute period, or a specified maximum service must be provided.
16. That short line and turnback service must be scheduled on the basis that the service beyond the point considered must be such that on any three consecutive cars there must be provided an average of a seat per passenger.

The standards thus developed are not, it was explained, to be based on the ability of the companies to meet them with their present equipment and facilities, but rather with the capacity that can be developed by the companies with the necessary betterments in construction, equipment and operating agencies worked out with the co-operation of the commission.

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Fare Hearing Shows Boise Company Borrowed to Pay Interest

The Boise Valley Traction Company, Boise, Idaho, has paid interest on its outstanding bonds with money borrowed from the Idaho Power Company. This was disclosed at the hearing before the Public Utilities Commission concerning the application of the traction company for a 10-cent fare.

The city protested against a 10-cent fare grant by the Public Utilities Commission, and also requested that the traction company show in detail how it lost the $54,572 in 1921 claimed in the petition.

The fact that the Idaho Power Company has aided in financing the traction company will have some bearing, it is thought, on its valuation proceeding now before the Public Utilities Commission. If working capital has included funds to finance another company, the commission will have to take this into consideration when it investigates the cost of obtaining the capital.

The Boise Valley Traction Company owns and operates the interurban lines, the South Boise line and the Eighteenth Street and Tenth Street belt lines. It is asking for increased fares on the South Boise line and the two belt lines.

Average revenue on the belt lines in 1921 was 4.91 cents a passenger and the average operating expense was 5.77 cents a passenger, the application states, or a deficit for each passenger of 0.86 cents. The company estimates that the increased rate will give it a revenue of $50,526. If the increase is allowed the revenue on the South Boise line will be increased from $16,637 in 1921 to $20,957.

At the hearing it was brought out that the 1921 power bill for four cars on the loop lines of the company and one on the South Boise line in 1921 was more than $18,000. City Attorney Lampert compared this statement with the power bill of $13,000 for six cars operated by the Boise Street Car Company.

The company has done no publicity work for several years toward increasing its business on its lines, according to the commission. No information concerning the advantages in buying strip tickets or commercial tickets in large quantities has been circulated among the passengers for several years.

Arguments are to be heard by the commission before it can render a decision.

Authorizes Five-Cent Fare in Hamilton

The City Council of Hamilton, Ont., by a vote of eleven to nine has authorized the Hamilton Street Railway to charge a straight 5-cent fare. The order states that the higher fare can be put into effect at an early date, remain in force until the end of the year and thereafter at the pleasure of the succeeding councils.

The relationship between the city and the traction company has been a strained one for some time now over the matter of fares. The electors had shown their disapproval of the 5-cent fare by a large majority on Jan. 2. The Mayor, however, urged the higher rate for the company stating that there was not another city in America, the size of Hamilton, where people could ride at a lower rate than 5 cents. The fare agitation in Hamilton has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

First Week of Pass in Fort Wayne Satisfactory

At the close of the first week's sales of the new weekly passes in Fort Wayne, Ind., S. W. Greenland, general manager of the Indiana Service Corporation, reported that the reception given the innovation by the Fort Wayne public was very satisfactory. Nearly 3,100 passes were sold the first week and it is expected that this number will increase. A tendency developed during the first week for the possessors of passes simply to tell the conductor that they had passes and to try to get out of the trouble of exhibiting the passes. But the rule of making every pass owner, who wished to use his pass, show it, was rigidly enforced and it is felt that this little difficulty will be entirely done away with in a short time.

Mr. Greenland declares that it depends on how the public overcomes all little points of friction in connection with the use of the passes whether the system will be maintained. He declared that the plan had been put into effect with the thought of speeding up the service and that it must not be allowed to become a hindrance in operating the cars efficiently. Passes good for a week on all city cars of the Indiana Service Corporation are sold for $1. They are interchangeable.

Transportation News Notes

Six-Cent Fare Allowed.—The Ohio Electric Railway, Springfield, Ohio, has received permission from the City Council of Newark, Ohio, to charge a 6-cent fare in that city for a period of one year.

May Try Trackless Trolley.—It is reported that the Grays Harbor Railway & Light Company, Aberdeen, Wash., may apply for franchises to outlying districts of the harbor cities in order to test the new trackless trolley system.

City Council Approves Five Cent Fare.—The City Council of Buffalo, N. Y., has indorsed a proposed amendment to the state law to limit electric railway fares in cities of the first and second class to 5 cents with free transfers.

Rerouting in Effect in Chicago.—Rerouting of cars of the Chicago Surface Lines in the downtown district of Chicago, Ill., under a plan proposed by John A. Beeler went into effect recently. For the most part the operation was satisfactory.

Reduced Fares in Effect.—Reduced fares of 16.2 per cent went into effect on all lines of the Connecticut Company on March 1. The tokens, three for 25 cents, have been on sale since Feb. 25 and there has been a liberal demand for them. The casual rides will still pay 10 cents unless they have tokens at the reduced figure. The tokens are obtainable at all central offices of the company and from car conductors. They may be obtained in large or small lots.

Approves of Increased Fares.—At a meeting of business men and prominent citizens of Springfield (Ore.) recently, unanimous approval of the proposed advance in the fares of the Springfield-Eugene electric line was given. T. L. Billingsley, superintendent of the company's electric railway lines, gave figures to show that the company is losing money under the present fare of 10 cents between Eugene and Springfield, and 5 cents on the city lines. It is proposed to advance the fares to 12 and 6 cents, respectively.

Five-Cent Fare Defeated.—During consideration by the Senate of the District of Columbia Appropriation bill, Senator Harrison of Mississippi sought the adoption of an amendment providing for a 5-cent street car fare, or six tickets for a quarter in the National Capital. Senator Jones, of Washington, also favored the amendment. A point of order against the amendment by Senator Phipps, Colorado, in charge of the bill was overruled by the presiding officer and the Senate then by a vote of 27 to 21 defeated the proposal.

Establishes Two Zones.—The Frankford, Tacony & Holmesburg Street Railway, Philadelphia, Pa., has been granted permission by the Public Service Commission to establish two zones and to charge an 8-cent fare in each zone. Tickets, good in either zone, will be sold in groups of eight for 50 cents. Monthly commutation books for $4.50 will also be sold on all passenger cars, good for fifty-two trips between Linden Avenue and Bridge Street. The first zone extends from the county line to Decatur Street and Frankford Avenue. The second extends from Frankford Avenue and Bridge Street north on Frankford Avenue to Blakiston Street, east on Rhawn Street from Frankford Avenue to the company's carhouse at State Road and Robbins Street and east on Bridge Street from the corner of Franklin Avenue to the company's carhouse. The company has two routes, one of which is leased from the Philadelphia Rapid Transit Company and is the connecting railway line between the Philadelphia Rapid Transit lines on the south of the city and the Trenton & Bristol Street Railway on the north.

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Personal Mention

E. J. Murphy Made Statistician

Association Recognizes Service to the Industry of Its Acting Statistician by Promoting Him

E. J. Murphy has been appointed chief statistician of the American Electric Railway Association. Since the changes effected as a result of the reorganization at association headquarters last year, Mr. Murphy has virtually been carrying on the duties as indicated by the above title. He has been in charge of the preparation of the special monthly reports and compilations prepared by the Bureau of Information and Service, the editing of the proceedings and advance reports of committees and the publication of the *Engineering Manual.*

Mr. Murphy was graduated from the

E. J. MURPHY

College of the City of New York in 1915 with the degree of Bachelor of Science. Subsequently he took several courses in statistical methods and the general theory of accounting at Columbia University. After a short experience as a rater in compensation insurance he came to the association in 1916 as an assistant statistician. Except for a period of military service in 1918, he has been with the association ever since.

Since the appointment of Mr. Welsh as executive secretary Mr. Murphy has taken a large part in the handling of the affairs of the Engineering Association and acted as secretary at its meetings during the last convention. His special field, however, has been general statistical work, and he has been a regular contributor to *Aera* on the subject of electric railway conditions as revealed by statistical data received at association headquarters.

With the appointment of G. C. Hecker as special engineer, as reported in these columns last week, it will be possible to expand the work heretofore carried on at association headquarters and Mr. Murphy will be able to devote his time in a greater degree to financial matters and to the general statistical work of the association, thereby enlarging this branch of the association's service.

F. L. Butler Given New Duties

Frank L. Butler, for the past year manager of the railway department of the Georgia Railway & Power Company, Atlanta, Ga., has been appointed general operating superintendent in charge of the railway, gas, electric and steam heating departments. He will also have charge of all matters pertaining to public service. Mr. Butler is also vice-president and a member of the board of directors of the Atlanta Northern Railway. He succeeds W. H. Glenn, who resigned as operating manager several months ago. He is recognized as an able executive in the gas and electrical industry, and as manager of the railway department for the company he has superintended the extensive improvements that have been carried out the past year. Mr. Butler, before assuming his position as manager of the Atlanta company, was manager of the Winnipeg (Man.) Electric Railway. He has also served with the Chicago & West Towns Railway and the Suburban Railway, Chicago, and the Alton, Jacksonville & Peoria Railroad.

J. R. Marsh Enters Utility Publicity

John R. Marsh, for the past two years on the editorial staff of the Atlanta *Georgian,* has been appointed assistant manager of the public relations department of the Georgia Railway & Power Company, Atlanta. Mr. Marsh has an exceptional record as a newspaper man in Atlanta. He has been connected with the Lexington *Leader* and Lexington *Herald,* and is a graduate of the University of Kentucky. He succeeds Paul Warwick, who is now with the Georgia Committee of Public Utility Information as executive secretary.

W. B. Spencer, who has been in charge of the transportation department of the Rhode Island Company, Providence, was recently appointed assistant to the president. He will be in charge of public relations.

John J. Treacy, president of the New Jersey Board of Public Utility Commissioners, has tendered his resignation for the second time since he was appointed a year ago. He wishes to resume private law practice in Jersey City.

Fielder Sanders, Street Railroad Commissioner of Cleveland from 1916 to 1921, resumed the practice of law in Cleveland on Feb. 15, with offices in the Hanna Building. Mr. Sanders was judge of the Municipal Court from 1912 to 1915. A review of his work, particularly that in the utility field, was published in the ELECTRIC RAILWAY JOURNAL for Jan. 7, page 60.

W. P. Bailey Retires

After Many Years as Traffic Manager He Leaves Olean, Bradford & Salamanca Railway

After thirty-three years of almost continuous service in the railway field, W. P. Bailey, traffic manager of the Olean, Bradford & Salamanca Railway, Olean, N. Y., retired from his work on March 1. He will enter business with Floyd L. Kelly, Olean. Mr. Bailey's health necessitated his giving up his very trying work.

Mr. Bailey's railway experience centered in the middle Western territory from 1903 to 1910. During this time he held various positions with the Indianapolis & Northwestern Traction and the many consolidations which form the Terre Haute, Indianapolis & Eastern Traction Company. He made for himself a prominent name among officials

W. P. BAILEY

in the electric railway industry throughout the central part of the United States, and when in 1910 he transferred his activities to the Eastern coast as general freight and passenger agent for the Western New York & Pennsylvania Traction Company, Olean, N. Y., he extended his reputation in this new district. In a year's time he proved his capacity for excellent and seemingly unlimited work and was made general freight and passenger agent, with management of the parks operated by the company. His greatest single contribution to the company might perhaps be said to be the building up of the freight revenue. This department he recognized was a source of income insufficiently developed. He therefore devoted his attention to realizing from it all its possibilities. After an illness of a year he returned to his work in this department until the reorganization and taking over of the property of the Olean, Bradford & Salamanca Railway. He was then appointed traffic manager of the newly organized company, the position he has since held.

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Charles R. Bohannon, for many years district purchasing agent and commercial manager for Southern Indiana of the Interstate Public Service Company, Indianapolis, Ind., is now manager of the lines at Jeffersonville. He succeeds Albert Keller, who now is associated with the American Public Service Company, Chicago, Ill.

J. F. Heyward, formerly general manager of the Cincinnati Traction Company, Cincinnati, Ohio, now retired and a resident of Tampa, Fla., has offered his services to the Quarter Million Club just organized and has been assigned to head the industrial bureau. This bureau has charge of investigating the financial stability of industries applying for the club's assistance and also the ability of such industries to be successful in Tampa. Mr. Heyward was formerly prominent in industrial, financial and engineering circles in the Middle West and East.

R. D. Williams has been appointed traffic manager of the Sacramento (Cal.) Northern Railroad. He will have supervision of both the freight and passenger service. Mr. Williams has a record of twenty-three years with the Erie Railroad traffic department in various parts of the United States. During the war he was furloughed to the government to organize and manage a traffic department for the housing division of the Emergency Fleet Corporation. After the war he acted as traffic manager for the California Fruit Exchange at Sacramento.

Obituary

Edward Hopkinson, M. P., is dead, at the age of sixty-two. He was one of the chief pioneers of electric traction in Great Britain. He belonged to a family which has long been famous in electrical and other sciences. Many years ago he carried out experiments at Portrush, Ireland on the first electric tramway constructed in the United Kingdom, and he designed the electric equipment of the Beesbrook and Newry tramway, also a pioneer line. Having joined the firm of Mather & Platt, he designed the electric plant and equipment for the City & South London Railway. This line, which was opened in 1890, was the first underground electric railway in the world, and represented the largest application of electric power for traction purposes that had been made up to that time. Mr. Hopkinson was also associated with other early electric traction undertakings and held a place of great distinction in his profession. The well-known Hopkinson test for dynamo machines is associated with the name of his family. His position in the scientific world is also indicated by the fact that he was a Doctor of Science of the University of London.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Competition Causes Decrease in Light Rail Prices

Prices of light rails have been gradually sagging in the past week or two and are now $1 to $2 a ton lower. A close analysis would probably show that the market for delivery in the general Pittsburgh district is off about a dollar a ton and that an extra dollar has come off for delivery to points removed from Pittsburgh, particularly in the East.

Demand has been fully as heavy as formerly and has probably increased somewhat. In other words, the light rail market has been moving in much the same spirit as finished products generally, an increase in demand tending to stimulate competition, thus bringing out lower prices.

Mills still maintain that the market presents a differential averaging about a dollar a ton in favor of rails made from new steel as against rails rolled from old rails. With concessions on large lots or for delivery at points where freight rates make competition particularly active, rails made from new steel may be quoted at 1.40 cents to 1.45 cents and rerolled rails at 1.35 cents to 1.40 cents, making a general range for the base price, on 25 to 45-lb. sections, 1.35 cents to 1.45 cents, with the usual differentials for lighter sections.

$400,000 for New Cars

The Pittsburgh (Pa.) Railways will purchase forty new cars at a cost of $400,000. These cars are to be of the latest double-truck type with low floor and all steel construction and will be equipped with four motors, air brakes, fare boxes, heaters and other modern appliances. They will be built by the Pressed Steel Car Company and the motors will be furnished by the Westinghouse Electric & Manufacturing Company. Delivery is to commence in about 100 days and is to be completed about fifty days thereafter.

City Council Prefers Local Builder for Seattle Cars

As stated in these columns in the Feb. 18 issue, recommendation for the purchase of 200 new cars was made by Peter Witt for operation of the Seattle (Wash.) Municipal Railway. In considering this recommendation the City Council of Seattle feels that the work should be handled locally. The Pacific Car & Foundry Company, a Seattle firm, with shops at Renton, has made a formal proposition to the Council to construct these cars at cost plus 10 per cent. Superintendent Henderson of the railway is also giving estimates of the cost for construction of the cars in the railway company's shops. The motor equipment will be purchased in the East as there are no local motor manufacturers.

Report Made on Car Surplus

Reports just received by the Car Service Division of the American Railway Association show that on Feb. 15 a total of 449,819 freight cars were idle because of business conditions, compared with 467,997 on Feb. 8. Surplus cars, that is cars in good repair and immediately available for service if necessary to meet traffic conditions, consisted of 278,481 of the total, while the remaining 171,338 represented the number of idle freight cars needing repairs in excess of the number normally regarded as being in bad order.

Steel Founders Meet

Operating representatives of the Electric Steel Founders' Research Group held a meeting in Milwaukee on Feb. 6, 7 and 8. This group was formed about two years ago for cooperative technical work toward improving the manufacture of steel castings.

At the Milwaukee meeting reports were made by the operating heads of plants on foundry problems that had been delegated by the group to the several companies. These included annealing, core practice, facing sands, furnace practice and pouring practice investigations.

Tokyo-Nikko Electric Railway

A company at Utsunomiya, Japan, is making arrangements to construct a high-speed electric railway between Tokyo and Nikko, at an estimated cost of 10,000,000 yen. Construction work is expected to be completed by next summer.

Metal, Coal and Material Prices

Metals—New York	March 7, 1922
Copper, electrolytic, cents per lb.	12.875
Copper wire base, cents per lb.	14.125
Lead, cents per lb.	4.70
Zinc, cents per lb.	5.00
Tin Straits, cents per lb.	29.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.675
Somerset mine run, Boston, net tons	1.875
Pittsburgh, mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	2.00
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.90
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	1.94
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	94.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots). N.Y., cents per gal.	85.00

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Rolling Stock

Dayton (Ohio) Street Railway has purchased fifteen Economy meters for installation on its new light-weight cars now under construction by the Cincinnati Car Company.

Missoula (Mont.) Street Railway expects to use a 300 hp. electric locomotive for the purpose of pulling freight. It will also be used as a snow plow.

Interstate Public Service Company, Indianapolis, Ind., has placed a contract for five one-man double-truck cars. The cars cost $11,000 each. They have a seating capacity of forty persons.

United Railways, St. Louis, Mo., through its receiver, has asked the court in charge of its affairs for permission to build fifty cars. They are to be of the "777" type, similar to the last lot of motor cars added to the system.

Track and Roadway

Brantford, Ont.—The City Council has approved the $80,000 by-law for the extension of the municipal railway.

Hutchinson (Kan.) Interurban Railway is backing a movement to build a belt line connecting the Arkansas Valley with steam railways in Hutchinson.

Alabama Power Company, Gadsden, Ala., is repairing its track on Ninth Street and when this work is finished will rebuild the track from Forest to Cansler Avenue.

Chicago & Joliet Electric Railway, Joliet, Ill., will lay new tracks on Second Avenue and Boulder Avenue in the spring. This work is the result of a twenty-year franchise recently granted the company.

Wisconsin Public Service Company, Green Bay, Wis., will soon begin building its extension on West Walnut Street. An order for 200 tons of rail has been made. This will cost approximately $12,000.

Tulsa (Okla.) Street Railway has started work on extending its Kendall car line one block east from the present terminus at College Avenue to the university athletic field. The Corporation Commission recently ordered this extension.

Philadelphia, Pa.—Sealed proposals for constructing signal towers and for furnishing and installing underground cables along the Frankford Elevated Railway were received at the Director's office, Department of City Transit, until noon on Feb. 28.

Claremore, Okla.—It is said that an offer has been made by C. Page of Sand Springs to the Non-Partisan Water Commission at Tulsa to build an electric line from Tulsa to Spavinaw via Claremore, connecting with the Missouri Pacific at Claremore. Free right-of-way for the Tulsa-Spavinaw extension is sought.

The New Orleans (La.) Railway & Light Company has placed an order with the Buda Company for a twenty-track carhouse layout. This work is to be built of A. E. R. A. 140-lb. 7-in. T-rail with solid manganese switches and manganese centers, mates and frogs. This company has also purchased two Universal rotary track grinders from the Atlas Railway Supply Company, Chicago. This business was handled in both cases by P. W. Wood, New Orleans, Southern agent for these manufacturers.

Power Houses, Shops and Buildings

New York, N. Y., Commissioner Whalen of Plant and Structures Department has recommended to the Board of Estimate the construction of a 12,000-kw. electric power plant on Staten Island at a cost of $1,235,000 to furnish power for municipal piers, trolley lines, trackless trolleys and ferries.

Cookeville, Tenn., is now receiving power from its new municipal hydro-electric power plant at Burgess Falls, 12 miles below Cookeville, on Falling Water River. The installation has a power of 600 hp., but a unit of 400 hp. can be added at any time. Cookeville has previously had a steam plant.

Georgia Railway & Power Company, Atlanta, Ga., has completed the interconnecting power system whereby interchangeable high-power electrical service is given throughout the entire South. Work on the Tugalo power station which will increase the company's hydro-electric power 88,000 hp., is being carried on rapidly.

The Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S., has signed a thirty-year contract with the Nova Scotia Power Commission for the purchase of electrical energy and power up to 18,000,000 kw.-hr. per year. The power will be furnished by the hydro development at St. Margaret's Bay near Halifax, a government project. The city of Halifax recently refused to take over the power produced by this development.

Pine Bluff (Ark.) Company is erecting a fully equipped receiving and sending radio station for experimental and demonstration purposes. This will be the first sending station of this radius in the state of Arkansas. It is a half kilowatt machine and will reach any of the Arkansas Light & Power Company plants in Arkansas. The Pine Bluff Company is under the same management. J. L. Longino, manager of the Pine Bluff Company, states that the aerial is to be on two 100-foot poles, placed near the company's main office here. The Arkansas Light & Power Company will equip its offices and plants at other Arkansas cities with receiving sets and instructions can be issued from the general office here to all branch plants. Trouble wagons are also to be equipped with wireless.

Trade Notes

Belden Manufacturing Company, Chicago, Ill., wire and cable manufacturer has announced the appointment of William P. DeVay as purchasing agent.

The Nichols-Lintern Company, Cleveland, Ohio, announces the completion of its new factory building, especially designed to meet its requirements. With the additional facilities now offered the demands for the company's car equipment apparatus will be speedily met.

Cummings C. Chesney, chief engineer and general manager of the Pittsfield Works of the General Electric Company, has been awarded the Edison medal for 1921 for meritorious service in electrical science or electrical engineering or electrical art. The work which won for Mr. Chesney this medal was the development of transmission apparatus, generators, condensers, transformers and converters while associated with the late William Stanley. The award is made by the American Institute of Electrical Engineers.

Reginal M. Campbell, well known in the electric light, power and railway fields, has resigned from the Habirshaw Electric Cable Company, to accept the position of special representative of the of the American Copper Products Company with headquarters in New York City. In his new connection Mr. Campbell will continue his activities in the fields he has specialized in for eighteen years. Prior to his connection with the Habirshaw company, Mr. Campbell was associated with the Ohio Brass Company. The American Copper Products Company, whose organization he has now joined, is one of the largest producers of copper products in the country. Mr. Campbell is a member of the New England Street Railway Club and the Railroad Club and Engineers' Club of New York.

New Advertising Literature

Industrial Works Bay City, Michigan, is distributing upon request catalog No. 113, illustrating and describing the type BC "Industrial" crawling tractor crane of 20,000-lb. capacity. This crane is adapted for use in railroad reclamation work and in storage yards.

The Four Wheel Drive Auto Company, Clintonville, Wis., has just issued a circular picturing and describing in some detail the installation of gasoline-driven cars on the Manhattan City & Interurban Railway, Manhattan, Kan., to replace the old electrical equipment.

Erie Electrical Equipment Company, Johnstown, Pa., has just issued a loose-leaf catalog of Erie fittings and devices. Some of the fittings included are panel-type fittings, wall and floor flanges, side outlet keys, insulator pins, parallel crosses, and various types of insulators for pipe support.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Reducing the Operating Ratio by Cutting Labor Costs

THIS issue of the ELECTRIC RAILWAY JOURNAL has been planned to give its readers practical information on some of the labor-saving methods and types of materials-handling equipment which have been found useful by electric railways. The need for more efficient location of equipment, better shop organization and more widespread use of labor-saving equipment has long been recognized. The present necessity for taking advantage of every means for reducing costs and improving methods is so urgent, however, that the presentation of new evidence and the restatement of familiar facts are timely in order to impress on maintenance department executives the economies that will result if measures to improve conditions are actively undertaken.

Industry in all its branches is now concentrating its efforts toward a reduction of labor costs. The value of materials-handling devices in keeping up output and controlling costs was demonstrated during the war. The lessons learned should now be applied toward reducing costs and speeding up work in railway maintenance departments. A comparison of the methods used by up-to-date maintenance shops with those of smaller and less fortunate electric railways shows that the latter do not turn out work as quickly and as efficiently as the former. This is undoubtedly due to the fact that the former provide special machinery for doing various classes of work and use methods of scheduling and performing detailed operations which are laid out to give the greatest output. Particular attention should be devoted toward perfecting the output per man and providing necessary labor-saving and materials-handling equipment in order to increase this efficiency. If railway maintenance departments desire to increase their output economically they can accomplish much by using better materials-handling methods and equipment. The cost of new or additional equipment can usually be quickly saved through reduced cost of labor.

Selling Its Own Association to the Electric Railway Industry

ON MARCH 15 the committee on company and associate membership of the American Electric Railway Association inaugurated its much heralded campaign for new members. Never before in the history of the association has a membership campaign been planned so comprehensively and organized so systematically as this one. There is all the more reason, therefore, that the whole association should pull together in making the campaign a success, because lack of full success would be much more conspicuous than if the plans had been less comprehensive. To speak bluntly, it's the duty of every one to help the committee put this thing over.

The bystander might ask the question, "Why all this effort if association membership is such a good thing?" Such a query is easy to answer; for all service, even of the highest type, must be sold, and it is harder to sell than tangible, physical things. This statement applies to education, religion, journalistic service and so on. In this case, however, the problem is somewhat simplified by the fact that the American Association is a co-operative organization. It has, therefore, a stronger appeal than would some service that might seem extraneous to the industry.

Don't Make a Manufacturing Plant Out of the Maintenance Shop

THE opinion that manufacturing is outside the electric railway company's field and is seldom justified is frequently expressed. There may be circumstances where it is permissible; for example, when remoteness from the manufacturer adds considerably to the cost to transportation and makes quick delivery impossible. Another case may be one in which the volume of shop work is not sufficient to keep the men busy, so that the manufacture of some simple part can be used to fill in. The deciding factor should be that of economy, and in this respect railway officials can be easily misled by inaccurate cost accounting. Where the same force of men is used for both manufacturing and maintenance work the determination of dependable shop cost data is almost impossible. They must be determined, however, if costs are to be controlled.

The manufacturer organizes and equips his plant to carry out a definite order of operations. The workmen perform the same operation over and over again and become highly skilled at it. Machinery is carefully located to expedite movement and promote efficiency. Required tools are near at hand and needed materials are ready with promptness and in the proper place to obviate unnecessary handling. All operations are coordinated and carefully planned with relation to the next following or preceding one to avoid lost motion or delay in production. A specially organized production department plans the order of procedure and provides jigs, special tools, dies, etc., for rapid and efficient manufacture and to insure interchangeability of the parts when completed.

All this is quite impossible in a railway shop where a large variety of work is done. The demands made by operating requirements of a railway will not permit a corresponding degree of perfection to be obtained. The variety of work done by each man and its relatively small amount prevent the handling of the work as it is handled in manufacturing plants. There is more lost motion and the atmosphere of orderly routine which pervades a well-managed factory is lacking.

Manufacturers emphasize the value of effective supervision and strict discipline and they can take advantage of piecework to insure a proper relation between the employee's pay and his output. Railway shops, on the

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other hand, are prevented from taking advantage of these economies by the restrictions of public control. As the railway supplies only its own demands, the quantities of material are small compared with the amounts used by manufacturers. The railway is thus not able to secure the lower prices of material which go with purchases in large quantities.

Manufacturing by electric railway shop forces should not be undertaken unless definite and enduring economies are gained. If such manufacturing is found advisable, it can be carried out much more efficiently and economically if the manufacturing department and its operation are definitely separated from those of the maintenance shop with the great variety of operations which it is called upon to perform.

Oblivion as a Policy

THE ideal condition for a public utility, in the opinion of a manager who has spent many years in the business, is when the public accepts its service as a matter of course. "They will never," he said, in expressing this view, "go wildly enthusiastic about the utility or be deeply grateful to it for the service it gives, and there is no reason why they should. If they go to the corner to take a car or turn the electric switch when they want light, because those two are the natural things to do when light or transportation is desired, the public relations of the company supplying the service are perfect. Its ambition should not be that of being foremost in the customer's thoughts when he has to use the car or electric service. Instead, its greatest wish should be to be forgotten. Oblivion is the end to be sought."

There is much to be said in favor of this idea. The same thought in regard to a nation is expressed in the proverb: "Happy is the country which has no history." Such a condition for a utility is far better than where the customer's first thought when he has to wait unduly for a car is that the company is and always has been inefficient, or where the company is in disfavor for one reason or another, even when the service is good. The same thought has been expressed also by the wish of some utility men that their company's name will keep off the first page of the daily paper, and that all events about it shall be chronicled purely as news in a short note or notes in the inside pages.

Nevertheless, while there may be some advantages, it is not the best condition for a country to have no history or for a utility to have no particular civic standing in the city where it operates. In many cases it is one of the largest if not the largest enterprise and taxpayer in the community, and for this reason if for no other it cannot lose its identity entirely, even if it would like to do so. Much that it does and many of its plans are of great interest to the public, which should be told about them, not in a blatant way, but simply and clearly through some means of public information.

A country without a history may be happy, but its citizens cannot take a vast amount of pride in it or have any strong sense of patriotism. In the same way, a utility which is practically unknown to those whom it serves may not incur their disfavor so long as things go just right, but it cannot be as strong in the community as if it had an established reputation for following a fair policy and being up to date.

Making Up for Lost Time in Deferred Maintenance

WHEN a man buys a piece of property, such as a house or a factory, he considers in connection with the price that he will pay the cost of putting the property into good condition if it is at all run down, and property that is changing hands, excepting that which has been built especially to be sold, is apt to be considerably out of repair. Just so in the larger case of a public utility which is being sold. Change of ownership in either case is apt to be accompanied by a wholesale liquidation of deferred maintenance. Thus a property like the railway in Toronto or Toledo, in passing from hand to hand, is given a thorough overhaul; money can be obtained for such work because the new owners are willing to give the property a fair show; they realize that they cannot expect it to demonstrate its full capacity as a money earner unless it is put into the pink of condition. And they know how to find this money under such circumstances.

The conditions in regard to backward maintenance which are made evident, and even conspicuous, in connection with a change of ownership are to some extent prevalent on all railway and railroad properties in this country today. Net incomes have been augmented, or deficits reduced, in part by cutting maintenance appropriations. This is unfortunate; if carried too far it will prove suicidal or confiscatory, depending upon the source of the compelling force which caused the appropriation slashing. There are, however, signs of improvement; managers, boards of directors and public service commissions are apparently realizing both the conditions and the possibility of finding money somehow. Fortunately, also, the costs of most of the elements of maintenance are coming down. This fact should be utilized to permit the making up of lost time in maintenance work, and fares should be reduced slowly enough to make it possible to recoup the impairment of capital caused by deferred maintenance.

When a full realization of the effects of further deferring rehabilitation is reached there will be a rather sudden reaction. The expenditure of millions of dollars within a few recent months in Toronto for this work illustrates on an extreme scale what must happen generally on a smaller scale very soon. Now is the time to get ready for the coming activity. As in Toronto, the careful preparation of plans and specifications, the utilization of standards which have been developed by the national engineering associations and the wise provision of labor- and time-saving machinery will in the end bring big returns.

Continue the Use of Labor-Saving Devices in Track Maintenance

FOR some reason expenditures for track maintenance are usually the first to feel a cut when times are hard and the last to be resumed when times get better. It may be taken as an index that better times are at hand when the news columns of this paper begin, as they are now doing, to record large track programs to be undertaken by the different companies.

In considering these programs the engineers should not overlook the fact that the times just passed have served at least one good purpose in teaching the value of labor-saving devices in track construction and maintenance. Probably no other means would have taught

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the lesson that labor costs could be lessened, even at increased rates of wages, by the use of labor-saving machinery and tools. Having learned the lesson, it should be their plan to continue the use of such devices and at the same time to attempt an even more intensive application thereof. The fact that the labor rate is lower furnishes no reason for any let-up in the saving of labor; there are yet a number of operations in track maintenance which are ripe for the application of labor-saving methods and devices. For instance, there is room for the development of some mechanical means for loading excavated materials, such as old concrete, earth and paving materials, upon work cars following the removal of the materials from the track. Most of this work is still done manually and there must be some way to do it mechanically, in part at least, at a lower labor cost. There are, of course, many operations which will continue to require manual labor, but the slogan should be "find a way or make one" to do it mechanically."

It Is Up to the Men Now

FINANCIAL success in the electric railway business depends more and more on the little economies. It is these economies multiplied by the tremendous units in which the business deals over the period of a year that make or mar profits. Almost from the start under Mr. Mitten in Philadelphia it has been greatly to the interest of the employees there to be careful in little things. Under the new plan for participation by the employees of the company in the profits of the company the men and women there will have more at stake than ever before. As matters now stand it is not stretching the point any to say that the proposal now under way in Philadelphia for employee participation in management and in profits after a return has been made to stockholders is an experiment that merits much wider attention than it has apparently received so far.

Participation in profits by empjloyees is, of course, not a new idea, though it has not been practiced to any great extent in the public utility field. In the Philadelphia case, however, the plan may be regarded as starting under particularly auspicious circumstances because there is a background of understanding and respect between management and men, built up over a period of more than ten years. During this time the effort has been gradually to educate the employees to a realization of the responsibilities imposed under the plan which will now go into effect.

The idea behind the Philadelphia proposal should be looked at impersonally. There is a good deal of prejudice in human nature. Mr. Mitten understands this perhaps much better than do his critics. As a result of the accomplishments of the past in Philadelphia under the policy of co-operative management the employees naturally are jubilant at the election of the entire Mitten slate to the board of directors and at the prospects ahead of them the coming year. Back of it all, however, evidence is not lacking that the employees realize more than ever before the burden that now rests with management and men, and that with success has come greatly added responsibility. If the spirit of the employees at Philadelphia as exemplified there in the past twelve years is any criterion for the future, then the lesson of what they will accomplish during the coming year may afford one of the brightest pages in the history of industrial relations. The management has done its part. It is up to the men now.

How Can Engineers Function Collectively?

THIS is an engineering age, and there are many national, state and municipal questions on which the views of the engineering profession as a whole would be most helpful. The problem is to make these views articulate. It was in recognition of this condition and with a sense of obligation to render such public service as they could collectively that the engineers of the country, by and large, formed a federation of their various national and local societies. Organized in the fall of 1920, this federation—The Federated American Engineering Societies—is still hunting the best answer to the question "How Can Engineers Function Collectively?"

During the first few months of its existence, the Federated Societies moved forward under the stimulating leadership of Herbert Hoover. The conception and the preparation of the report on the elimination of waste in industry gave point and direction at the start to the activities of all engineers. The problem now before the federation is to effect an every-day working method of collective action by engineers, and this is a two-part problem, namely, (1) to find those broad subjects in which all engineers may have a definite interest in the field of their common activity, and (2) to give collective expression to the views obtained on these subjects. The body of men making up the executive board is fully aware of the necessity of so organizing the work of the federation that both these objects may be attained. At last week's meeting of the executive board in Chicago President Cooley, just returned from a swing around the circle of member societies, gave voice to the thought that the principal program to be worked out during the immediate future is not so much to study and report on different subjects as organization and method.

The list of accomplishments of the meeting in Chicago is a list of resolutions tabled, and from one point of view seems to indicate a complete failure of the federation to function. Looking deeper than the surface indications, however, the problem is better stated by saying that the questions came before the federation in such a form that it was not possible to pass intelligent judgment upon them, and the federation is to be commended for refusing to go on record on a group of problems of which it had no intimate knowledge.

All this may seem somewhat foreign to the electric railway business. Actually, it is closely related, for two reasons. One is that the electric railway industry is an engineering industry and contains many engineers whose voice will be eventually heard on problems which the federation must consider. The other is that once collective engineering action and opinion is made effective in the service of the nation, the electric railway industry will be better understood by the public and will share in any benefits which are generally effected.

So, to this effort of the engineers, encouragement should be given. Little by little, the federation is making progress in its problem of organization. When this is solved engineers will be able to do collective work effectively.

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Expediting Armature Repair Work

Features of New Baking and Dipping Outfit in Kansas City Railways Shop Are the Special Provisions for Efficient Handling and Testing of the Armatures—Insulation Condition of Each Armature Can Be Followed as It Bakes—Experience Related as to Best Practice in Baking Process

BY HENRY S. DAY
Equipment Engineer Kansas City (Mo.) Railways

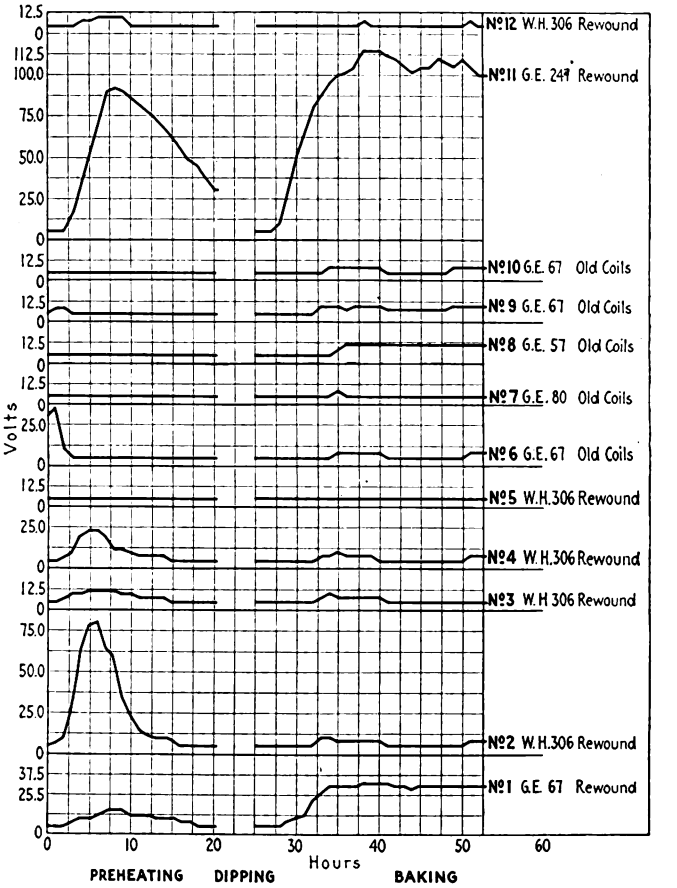
AN ELECTRIC baking oven with special facilities for handling, dipping and baking armatures was designed and installed on this property by the writer during 1921. Baking ovens are now in rather general use, and in the main the methods followed are about the same, although there is still much discussion as to how the varnish should be applied, how the armatures should be drained and how long they should be baked. The object in view in working out the scheme installed in Kansas City was to provide equipment and facilities which would reduce to a minimum the handling operations and make possible the repairing of armatures on a quantity production basis with correspondingly low labor cost.

The new oven is divided into two compartments, each being an exact duplicate of the other and operated as an individual unit. Each compartment has rack capacity for twelve armatures, six on either side, with an aisle between racks in which a 34¾-in. gage track extends entirely through the oven and to the extreme end of the section of the shop where this repair process is carried on. Both ends of the oven compartments are equipped with doors that are connected with counterweights, which have proved to be an excellent feature, as the doors are easily and quickly raised or lowered and remain in whatever position is desired. The installation of doors on both ends of the compartments has also been well worth while as they increase the flexibility of the oven and make it possible to pass out armatures from either end so that there is no waiting time between operations. The arrangement of having an aisle between racks gives ready accessibility to any particular armature or to field and miscellaneous coils stacked on skeleton shelves placed on the racks when armatures are not being baked.

The oven is set on a concrete floor. The walls and roof are constructed of ⅛-in. sheet iron and 1-in. sponge asbestos supported on 1-in. special channel iron. The outside is ⅛-in. sheet iron which is insulated from the channel iron with ¼-in. transite, thus providing a ¼-in. air space. Nearly all seams are welded, and tests have shown that there is very little radiation of heat.

After many tests to determine the best baking temperature, the thermostatic control was set to cut the electric heaters in at 230 deg. F. and out at 240 deg. F. With this automatic heat control the ovens require no attention from the operator during the baking period. The heating units are standard Westinghouse equipment, type C oven heaters, and also the control, including push-button switches which automatically cut off the current from the heaters whenever the doors are opened.

For placing armatures in oven, a steel-frame, four-wheel truck is used which has fixed levels matching up with both the upper and lower tier of racks in the oven. The armatures are thus easily rolled by hand from truck to rack and vice versa. The truck wheels are fitted with roller bearings so that even with a maximum armature load the truck is readily moved by hand. The brackets are faced with copper, as are also the racks in the oven, so as to protect the armature shafts. When an armature is placed on the truck it is prevented from rolling off by a taper pin inserted in a hole drilled in the armature rest. This pin is chained to the truck to prevent its being lost. The truck will hold two armatures at a time, one on either level. The design of the truck eliminates the necessity of raising or lowering an armature in order to transfer it from truck to rack or vice versa. Hence one operator can easily and quickly push the truck into the oven and roll the armature onto the rack ready for drying or baking.



TYPICAL INSULATION CURVES FOR ARMATURES IN COURSE OF DIPPING AND BAKING

Reference to the plan drawing reproduced herewith will show that the section of the shop at the end of the oven where the dipping is accomplished is served by an overhead traveling crane equipped with two electric hoists. This crane serves the entire section for both compartments and each compartment is served by its individual oven truck, such as has just been described, for transferring the armatures in and out of the oven.

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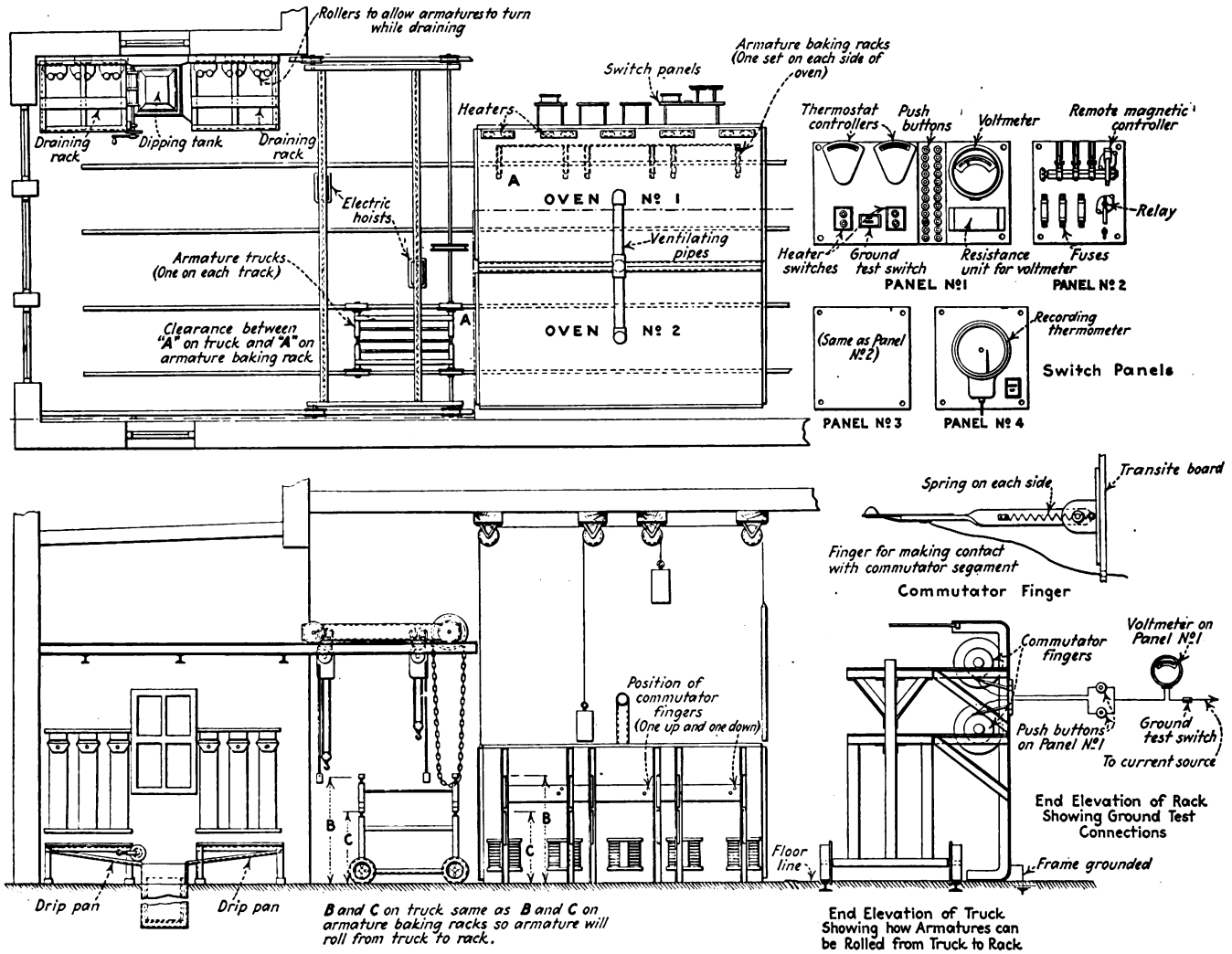
Armatures are dipped pinion end down and immersed in varnish up to the commutator ears, but not over. The draining is done by supporting the armature so that it rests at a sharp angle with the vertical. This is obtained by setting the pinion end of the armature shaft on a center pin and leaning the commutator end against two rollers supported on slides against the wall. Thus supported on a steel-point center the armature can easily be rotated. As soon as an armature is removed from the varnish and placed on the drain rack the operator gives it a quarter to a half turn at short intervals, according to the way it drips during the entire draining period. With the armature at the angle described this thoroughly drains all free varnish and prevents pocketing and unbalancing. Differences in lengths of armature shafts were taken into account by mounting the rollers in slides to permit them to be raised or lowered easily.

As it was desired completely to immerse the armature in the varnish, pinion end down, a bottle-shaped clamp was designed, having a copper lining to protect the shaft, and arranged to be clamped over the commutator end. This allows the armature to be lowered into the varnish in an exactly vertical position. The copper lining of the clamp not only protects the shaft but supplies sufficient friction to make the clamp perfectly safe. This clamp is put on when the armature is first brought to the dipping tank and it remains on the shaft until the armature is dipped and drained and ready for the oven.

As the lengths and diameters of the armatures handled vary considerably, the dipping tanks were built with a false wooden bottom which can be raised and lowered by a small hand windlass. As soon as an armature is lowered to the desired depth in the varnish, the bottom is raised until it carries the weight of the armature, and the windlass is locked there by a dog. A wooden framework is then secured to the upper or commutator end of the shaft, holding the armature in an exactly vertical position so that the crane and hoist can be released for other work.

When the draining of an armature has been finished and it is ready for the oven, the front hoist on the crane is used to lift the armature from the drain rack into the air. The pinion end is then picked up with the rear hoist and the armature is returned to a horizontal position and placed on the truck for transfer to the oven. Accompanying photographs show the sequence of operations from the time the armature is delivered to the crane from the floor truck to the time it is placed on the racks in the oven.



PLAN, ELEVATION AND DETAILS OF BAKE OVEN AND EQUIPMENT, SHOWING COMPLETE LAYOUT

INSULATION IS TESTED PERIODICALLY WHILE ARMATURES BAKE

A feature of this oven which has been found to be of great value is a method of testing the insulation of each armature while it is in the oven. This is shown on the drawing and also in one of the photographs. The arrangement consists of a contact finger mounted on a

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transite board and fitted with springs so as to provide pressure against the commutator. This contact is arranged to snap forward or back of the center so that when it is disengaged it will snap back out of the way, and as soon as an armature is placed on the rack a slight movement again snaps it against the commutator. The contact is connected through a 500-volt push button, a voltmeter and a switch to a 500-volt circuit. With the racks in the oven grounded, this gives a ground or insulation test. Each armature location in the oven is numbered, the lower tier being odd and the upper even to correspond with the numbers on the push buttons. The twenty-four push buttons thus make it possible at any time during a baking period to take a voltmeter reading for any armature and determine the insulation condition without opening the doors and cooling off the oven. While most armatures will show much the same curve of voltmeter readings, an occasional one will require special treatment and this arrangement eliminates all guesswork.

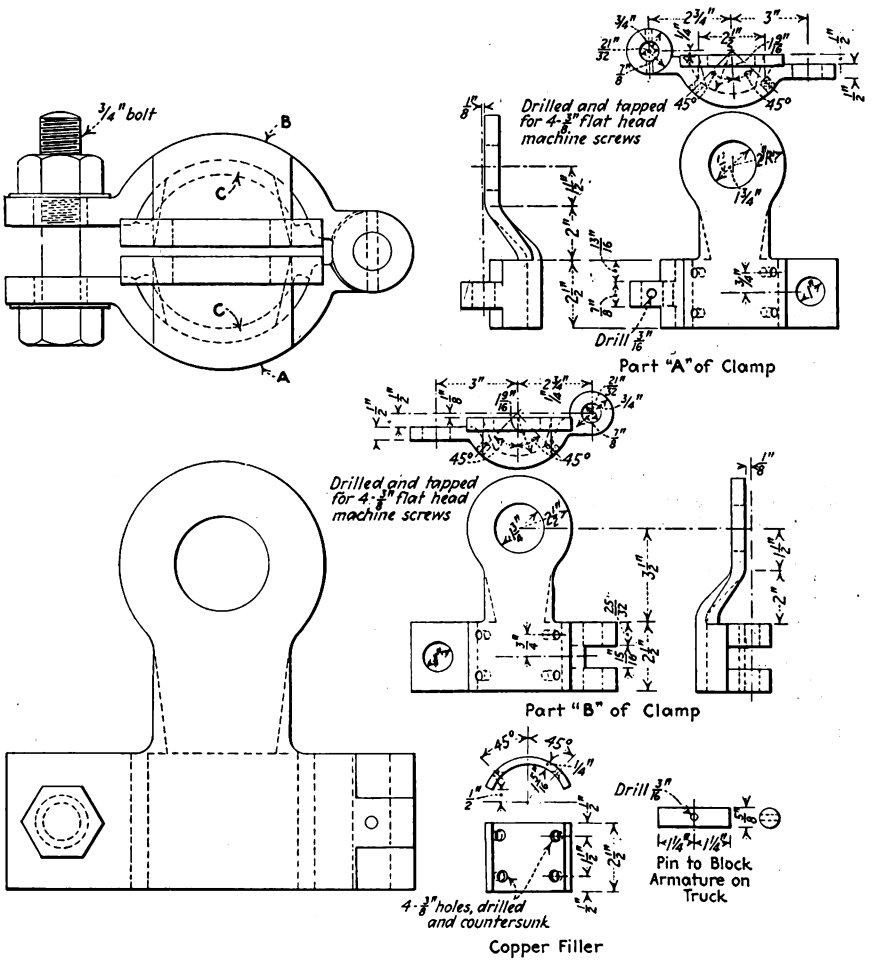
It will be noted that the drawing shows a ventilating duct for each oven compartment, but not much stress has been laid on this point. Both natural and forced ventilation have been tried and tests of several different batches of armatures made with each method of ventilation, and also without any ventilation, and little if any difference has been found in the results obtained.

Preheating, Dipping and Baking Time Determined

Just how long an armature should be preheated, allowed to remain in the varnish, drained and finally baked, seems to be a matter for each engineer to decide for himself. In the end, the time allowances depend on the results obtained if the tests leading up to the results have been carefully worked out. Results with this oven unquestionably have been excellent, and after many lengthy tests certain standards have been adopted and are now being followed in the daily operation. These standards are very simple. All armatures, both old and rewound, are preheated from twelve to fourteen hours. As a rule all armatures will test practically clear with this number of hours of preheating, but if any armature in the batch shows a high voltage reading it is kept in the oven until it comes down. If the reading grows constant near the peak the armature is taken out and the trouble located, even if this requires removing bands and lifting coils. Sometimes a rewound armature with green coils will show a reluctance to clear, but eventually will come down with sufficient heating.

After preheating, the armatures are dipped in varnish having a specific gravity which is kept as nearly as possible at 0.875 Beaumé by the addition of new varnish or benezine and allowed to remain in the varnish until all bubbling stops. This of course indicates that all air pockets have been penetrated. The armatures are then drained from fifteen to twenty-five minutes and then placed in the oven. When the oven is charged to its full capacity it is closed up and the heat turned on and kept on from twenty-five to thirty-five hours. Readings are taken at intervals during the baking period, and unless some one or more armatures show a high voltage reading, the oven is opened at the end of the normal period and the armatures released for commutator turning and slotting, if necessary, as soon as they are cooled.

When the oven was first started various tests were made with and without ventilation, some over a period of ninety hours in which ten-minute voltmeter readings were taken from start to finish. The chart shown herewith gives some typical curves which in most cases show that armatures were practically clear during the entire operation, although it will be noted that one curve disclosed an armature that at the end of the baking period indicated that the insulation resistance in the coils was low. As a matter of fact in the daily operation of the oven the voltmeter test on the average armature does not tell much, but it does show up the armature with weak insulation. In arriving at the twelve to fourteen hour preheat period, the voltmeter test showed practically all armatures clear, while anything less than that was not certain. In arriving at the twenty-five to thirty-five hour baking period, armatures that had been baked a much longer time were stripped and the coils and insulation were examined to find out what the penetration was, whether there were any pockets of wet varnish and to what extent the varnish had dried. By



Assembly and Details of Armature Lifting Clamp

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first taking an armature that had actually baked sixty or seventy hours and examining the condition of the insulation by opening the windings and then working back in the same manner on armatures that had been baked for shorter periods, it was eventually determined that this twenty-five to thirty-five hour period was sufficient.

The following table gives the capacity of the oven with both units working up to maximum:

First Batch of Twelve Armatures		
Monday	5:00 P. M.	In for preheat
Tuesday	7:00 A. M.	Out for dipping
	10:00 A. M.	In for bake
Wednesday	4:00 P. M.	Out; end of bake period
Second Batch of Twelve Armatures		
Wednesday	5:00 P. M.	In for preheat
Thursday	7:00 A. M.	Out for dipping
	10:00 A. M	In for bake
Friday	4:00 P. M.	Out; end of bake period
Third Batch of Twelve Armatures		
Friday	5:00 P. M.	In for preheat
Saturday	7:00 A. M.	Out for dipping
	10:00 A. M.	In for bake
Sunday	4:00 P. M.	Out; end of bake period

This schedule produces thirty-six dipped and baked armatures per week for each compartment, or a total of seventy-two armatures from the oven. This also gives from 4 p.m. Sunday to 7 a.m. Monday, or fifteen hours, for baking coils, etc., without interfering with the maximum capacity of the oven. This schedule can, of course, be adjusted for greater capacity if desired.

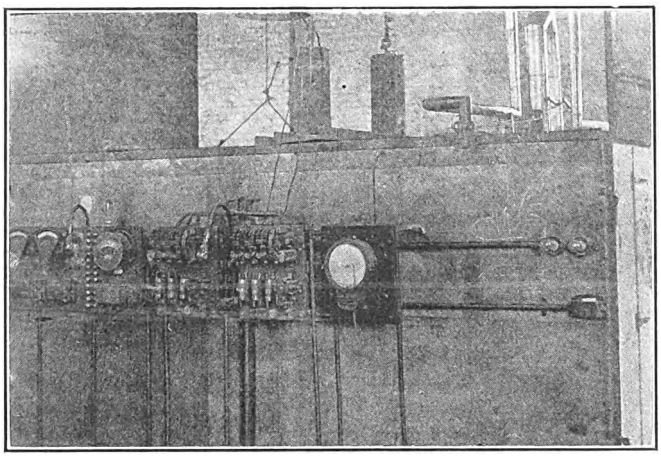
With energy delivered at the oven at 1½ cents per kilowatt-hour, varnish at $1.87 per gallon and two operators at 45 cents per hour, it is costing $2.765 per armature to bake and dip. This cost is figured from the total number of armatures dipped and baked per month without regard to size and comprising G.E. types 57, 67, 70, 80, 247 and 258, and Westinghouse types 506 and 306. This cost has been carefully checked and is very close to the exact cost of the operation.

The total investment in the baking oven and auxiliary equipment in the Kansas City shops amounts to very close to $6,000. It should be explained that this investment includes from $1,500 to $2,000 of development costs, which would not be involved in building another similar installation. To get at the total cost per armature, including overhead, interest on the $6,000 investment is figured at 6 per cent, or a total per year of $360. While the total capacity of the baking and dipping facilities is seventy-two armatures a week, the actual production will be about forty-eight a week, as this will take care of the normal overhaul program. This amounts to 2,500 armatures per year, over which the interest charge is spread, or an interest charge per armature of 14.4 cents. Adding this to the $2.76 labor and material cost above, the total cost per armature is $2.91.

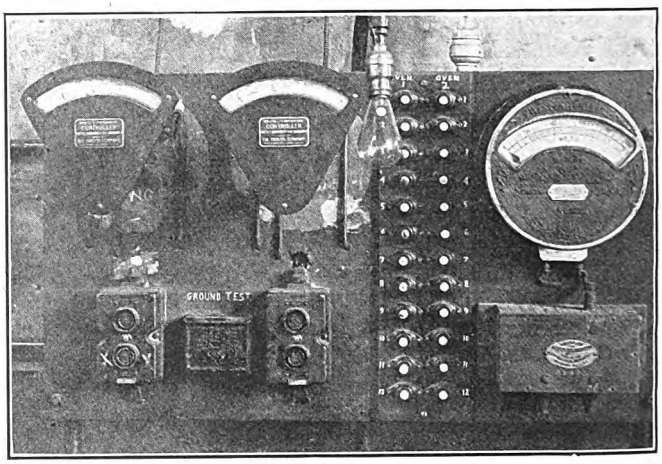
Operating Results Will Decide Baking Period

Some engineers may claim that with this cost per armature the expense is too high to justify the process, but the results already obtained on this property contradict such a claim. The question has also been frequently discussed as to how often an armature should be dipped and baked. It would probably be difficult to set up any given period of time or number of miles for an armature to remain in service between baking operations, but on this road it has finally been decided that all armatures and field coils will be dipped and baked when the cars are put through the shop for the regular overhaul, which is conducted on a 45,000-mile basis, or approximately every sixteen months. Following this schedule has already substantially reduced the number of motor failures.

A great deal of time and study has been given to the design and use of this baking outfit in order to obtain the best possible results. Whether or not the best results have now been attained is not yet certain, but the study from now on must be one of service observations. For instance, the writer was always inclined to a longer baking period, but as the results with the time and method described are certainly good, it is the intention to continue the work along the present lines and keep a close check on operations at the oven and the performance of the armatures in service, and from time to time make any changes that may be suggested from the data gathered.



Control and Test Equipment as Installed on Side of Baking Oven



Close-up of Push Buttons and Instruments for Testing Any Armature in the Oven

Report on Rail Corrugation

A COMMITTEE of the Municipal Tramways Association in England which for the past five years has been investigating the subject of rail corrugation has recently made a report. This states that all observations lead to the conclusion that corrugation of steel rails is inseparable from the action of heavily loaded wheels rolling along the surface of the tread of the rails. It appears that this rolling originates the corrugation by giving rise to superficial stresses in the material of the rail tread which are in excess of the elastic limit and of the toughness of the material.

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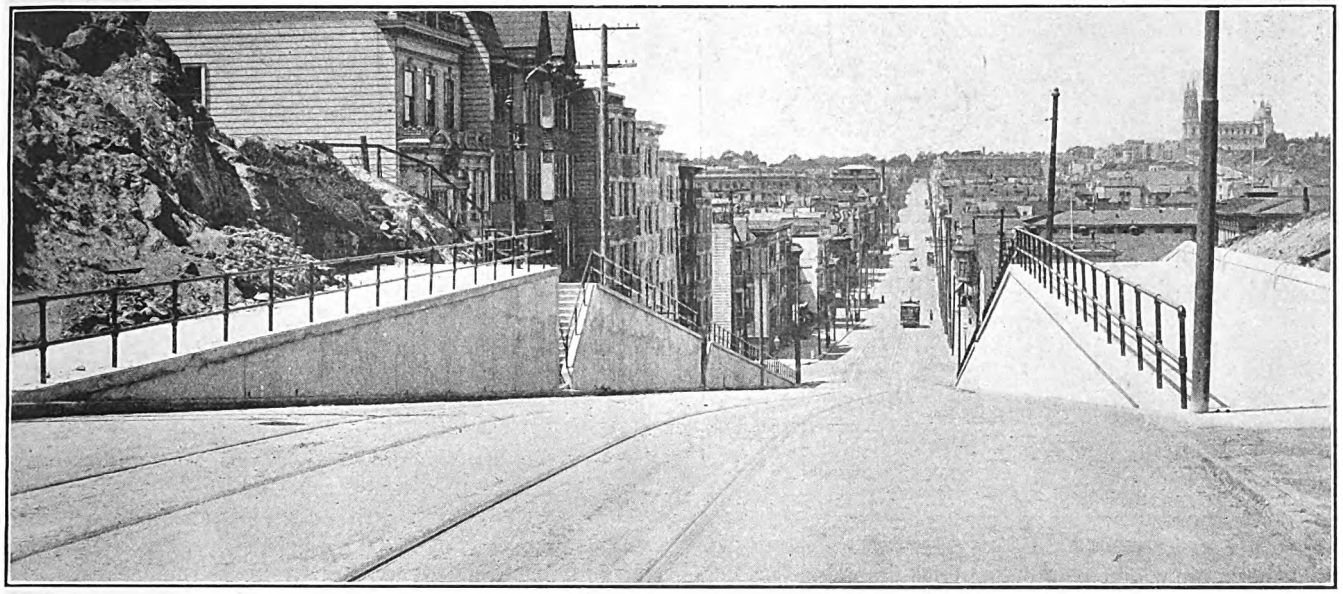

ONE OF THE SEVERE GRADES OF THE MARKET STREET RAILWAY SYSTEM

Give Your Motors a Chance to Make Good

Through Careful Attention to Maintenance Details the Market Street Railway of San Francisco Operates Old Type Motors in Extremely Severe Service Without Excessive Trouble

BY J. M. YOUNT
Master Mechanic Market Street Railway, San Francisco, Cal.

RECENTLY the Market Street Railway constructed some new cars, and in giving the motor manufacturers the data it was stated that the motors for each car should be four 40-hp. and of an interpole ventilated type. The cars were to weigh 40,000 lb. complete, and all other data were given. One manufacturer refused to guarantee the service temperature of the motors under the conditions given. This caused us to stop and reflect: Why would not the manufacturer guarantee new, up-to-date motors for a service in which we were using old motors of much smaller size with satisfaction? Here we were operating 33 per cent of our cars, weighing 42,000 lb., with four 35-hp. GE-1,000 motors purchased between the years 1900 and 1903, on lines with grades as high as 13 per cent. These motors were performing economically from every standpoint.

As most all electric railways have a considerable number of old-type motors, it may be of interest to know of our system of handling the 900 GE-1,000 motors which we have in daily service. On account of the big fire in 1906 and the strike of 1907 our car equipment did not get the care due it. In 1910 we were looking with envy toward those companies that were replacing the GE-1,000 motors with up-to-date equipment. There was no hope for us in the way of new equipment, however, on account of finances, so we kept a record of the principal faults of this type of motor, and then we endeavored to provide a means to overcome them. The principal trouble consisted of grounded commutators, flashing over at commutators, bent brush holders, bent brush holder yokes, open circuits in leads, holes burned in neck of connections and field terminals burned off.

The above troubles seemed to have about condemned the motors to the scrap pile. We found that the grounded commutators could be traced to the oil from commutator end bearing creeping over onto the string band, collecting carbon dust and thereby eventually causing a ground. We substituted solidified oil and waste in place of oil for lubrication and there was an improvement. Next we eliminated the string band and oil linen from the mica ring and painted the mica ring and face of the commutator with a paint made of shellac and oxide of iron. Since then grounded GE-1,000 commutators have been rare.

The problem of reducing the number of flashovers was a difficult one, as there were so many things that could cause this trouble. A century field tester was purchased and a survey was made of all the field coils in use. The result showed 600 fields short circuited. These were replaced with impregnated fields, which produced an improvement. Commutators were next slotted, and a proper carbon brush was selected, another improvement. Brush yokes and holders were set with a templet and brushes were checked to insure proper spacing. Now in place of going over 13 per cent grades in series, a four-motor car weighing 42,000 lb., equipped with GE-1,000 motors, loaded with 125 passengers, takes the grades in full parallel without flashing. We paint our brush yokes with the same paint as is used on commutators. Open circuits in leads and holes burned in connections, in the majority of cases, can be traced to mechanical faults, such as loose commutator shells, loose end bells or loose core laminations.

We are very particular before rewinding a core to see that commutator shells, end bells and laminations are as they should be. We have replaced the cast-iron nut that holds the laminations together with a steel one made from a section of a fifteen-tooth pinion. We are

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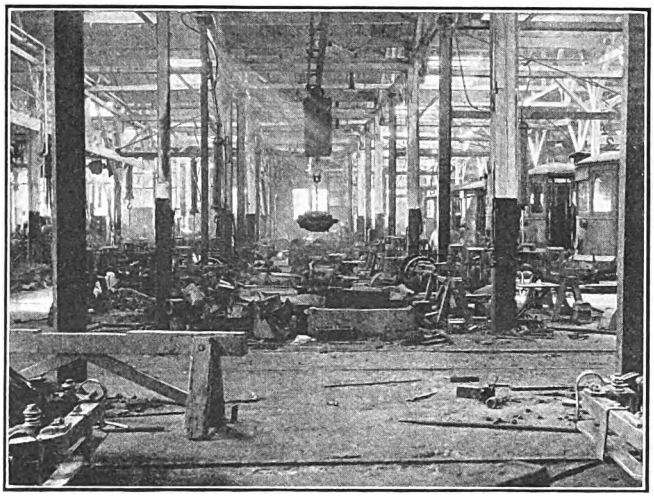


MOTOR CLEANING AND OVERHAULING DEPARTMENT

able to get a wrench to fit over this and make it tight while the laminations are under hydraulic pressure. The foregoing refers to work done by the main shop.

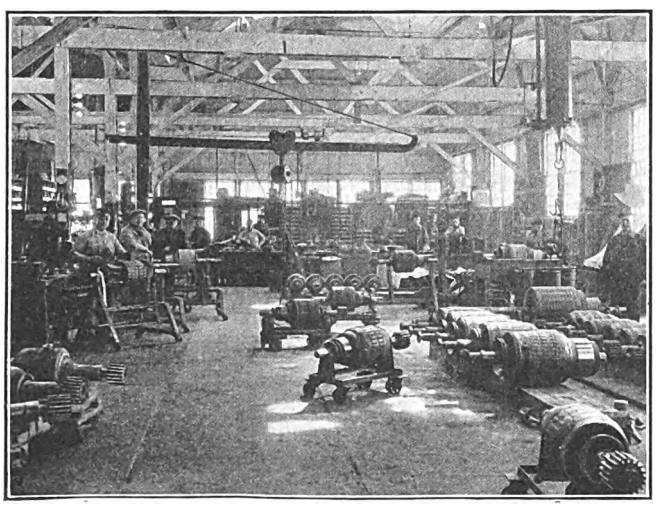
With the use of solidified oil and waste as a lubricant, we have determined that the motors will safely operate 1,400 car-miles, so we have set that period for operating between car inspections. We make a daylight inspection as follows: One gill of solidified oil mixed carefully with the waste is added to a bearing. Very little new waste is added and the oiler uses his own judgment as to the amount to use. Any new waste added is placed next to the bearing. Brushes are removed from brush holders and wiped off and the brush holder springs are tested. Brush yokes are tested for loose brackets and splits. Special attention is given to the proper spacing of brushes between brush holders and to lining up the brushes properly with the commutator. The commutator slots are cleaned and brushed out with a fine wire brush.

The outer mica ring of the commutator is cleaned off and is painted with shellac and oxide of iron paint, when necessary. The armature bearings are inspected for wear in the housings. A feeler is passed between the fields and the armature for a test of clearance. Field coils are inspected to see if they are clamped tight.

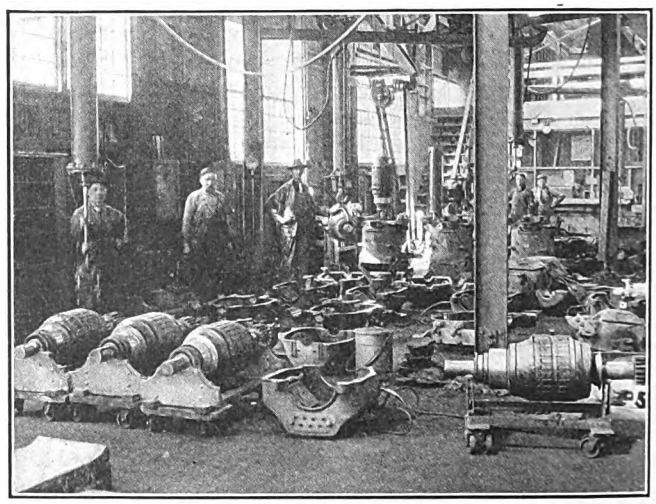
The general overhauling of the motor is most important. This we do on a 70,000-mile basis and in a thorough manner. The motor is dismantled from the truck and is taken by a crane to the motor overhauling department. There the motor is opened up, the armature is taken to armature room, fields are tested for short circuits and then they are removed from the core and inspected. All field jumpers and leads are sleeved with brass sleeves and are put in condition for another run of 70,000 miles. Mechanics highly skilled in assembling motors are a wonderful asset, and it is to them that a great deal of our success is due. In bolting the field piece to the motor frame we are very careful to see that they come together tightly without air gap.

As some railway properties are able to buy modern motors and scrap the GE-1,000 type, we have been able to pick up the GE-1,000 motors complete for less than the new value of the field coils in them. In dismantling these old motors we have learned why the different properties were unable to run them with satisfaction and we will gamble that if the new motors are allowed to go by default the same way that these motors have, within six years they will be giving as much or more trouble than the GE-1,000. For instance, we purchased some motors and found the throw of the leads of the armatures was wrong. They would run one way O.K. but would blow when operating in the reverse direction. Another road scrapped a number of them on account of high maintenance cost and frequent pull-ins. We found the field coils too thick, not allowing the pole pieces to come in contact with the frame, thus causing an air gap and spoiling the magnetic field.

The month of January, 1922, was very rainy; in fact, it was the worst month we have had for years. The number of cars equipped with GE-1,000 motors turned in for motor trouble was forty-seven, booked as follows: Thirty-six for armature trouble, six for field trouble and five for brush holders. The mileage made by cars equipped with GE-1,000s for the month was 639,464 or 13,600 car-miles per turn-in for motor trouble. We have interpole motors operating on our system that were purchased eight and ten years ago. These operate with less weight of car per rated horsepower than the GE-1,000, and as regards economical maintenance they have but little margin on the GE-1,000. They are, however, more satisfactory from the operating standpoint inasmuch as they will stand much faster feeding of the controller. In the last twenty years the manufacturers have made us good motors, but we, who operate them, have not always given them a fair chance to make good, and many have gone to the junk pile that if properly operated and maintained would have lasted for years.



A CORNER OF THE ARMATURE ROOM. DIPPING TANK AT RIGHT WITH ARMATURE IN PLACE



ASSEMBLING MOTOR PARTS IN SHOPS OF THE MARKET STREET RAILWAY

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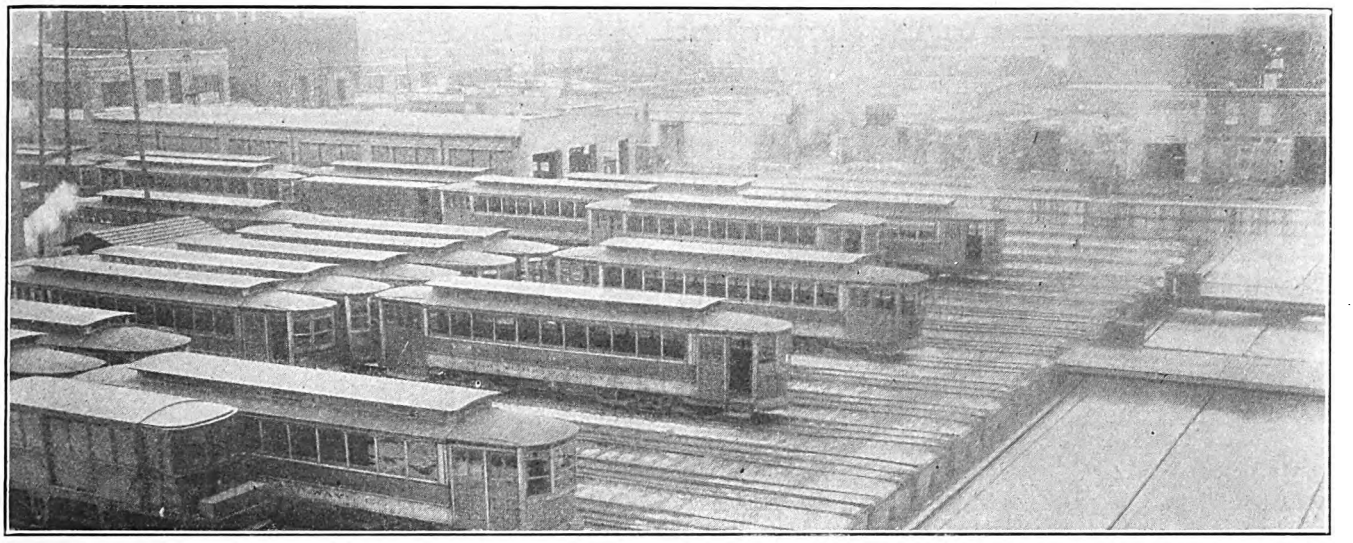


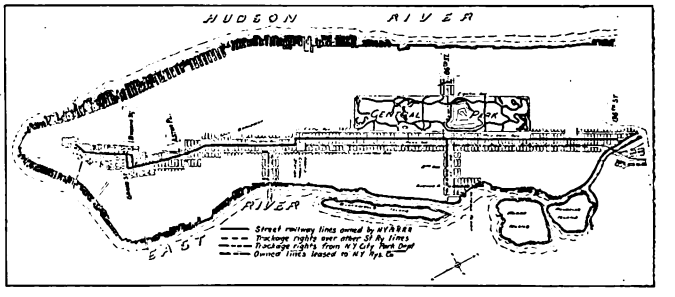
NEW YORK & HARLEM STORAGE YARD AND ADMINISTRATION AND SHOP BUILDING, LOCATED AT 135TH STREET AND MADISON AVENUE, NEW YORK CITY. OUTDOOR TRANSFER TABLE IN FOREGROUND, SHOP BUILDING IN BACKGROUND

New Maintenance Facilities for New York & Harlem Traction Lines

Former Part of New York (N. Y.) Railways, Operated Independently Since Feb. 1, 1920, Has New Maintenance Shop and Administration Building and Unique Storage Yard at 135th Street and Madison Avenue

ON FEB. 1, 1920, the 999-year lease of the Fourth and Madison Avenues and the Eighty-sixth Street Crosstown Lines in New York City to the New York Railways was terminated. The latter simply could not pay the rent.* When the owners took over the property they were illy equipped to operate it, as the maintenance work and general administration had been completely merged with that of the lessees. However, by drafting several members of the staff of the New York State Railways, controlled by the same financial interests, the management was able promptly to adjust itself to the new conditions. Temporary storage and maintenance arrangements were made with the former lessees and others, but as rapidly as possible the New York & Harlem provided for complete independence.

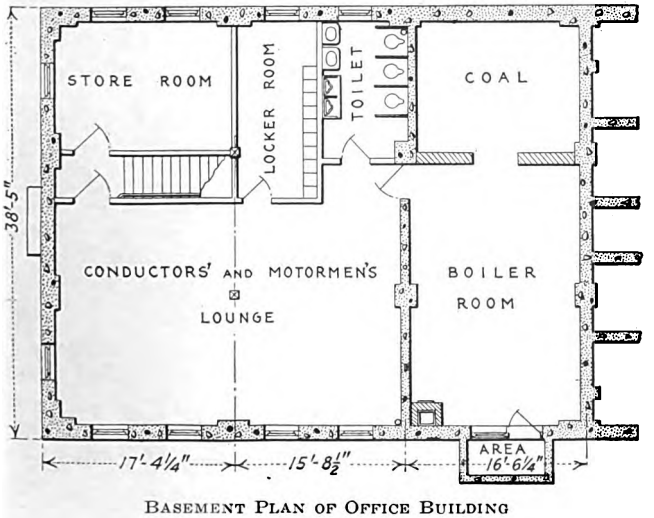
The first step was to provide for repair-shop quarters,



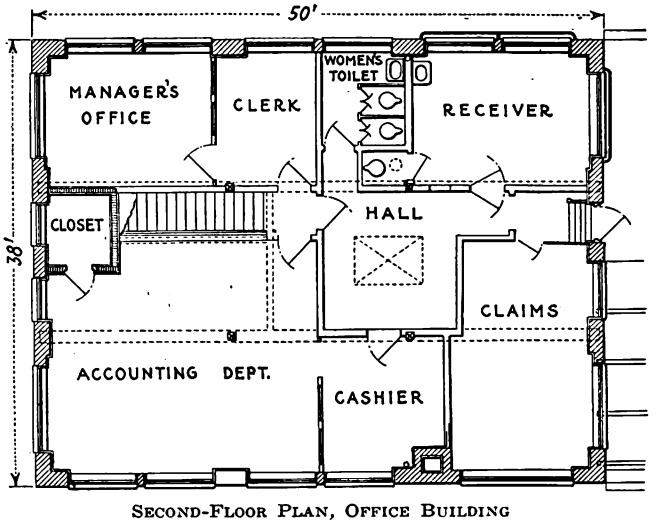
OUTLINE MAP OF NEW YORK & HARLEM TRACTION LINES

which was done by renting space in the carhouse of the Second Avenue Railroad at 1874 Second Avenue. Plans were also laid for abandoning the carhouse and temporary headquarters on Fourth Avenue at Thirty-second Street, for which satisfactory rental terms could not be obtained. A piece of property owned by the com-

*For details of the return of the properties to the owners see the issue of this paper for Feb. 7, 1920, page 305.



BASEMENT PLAN OF OFFICE BUILDING



SECOND-FLOOR PLAN, OFFICE BUILDING

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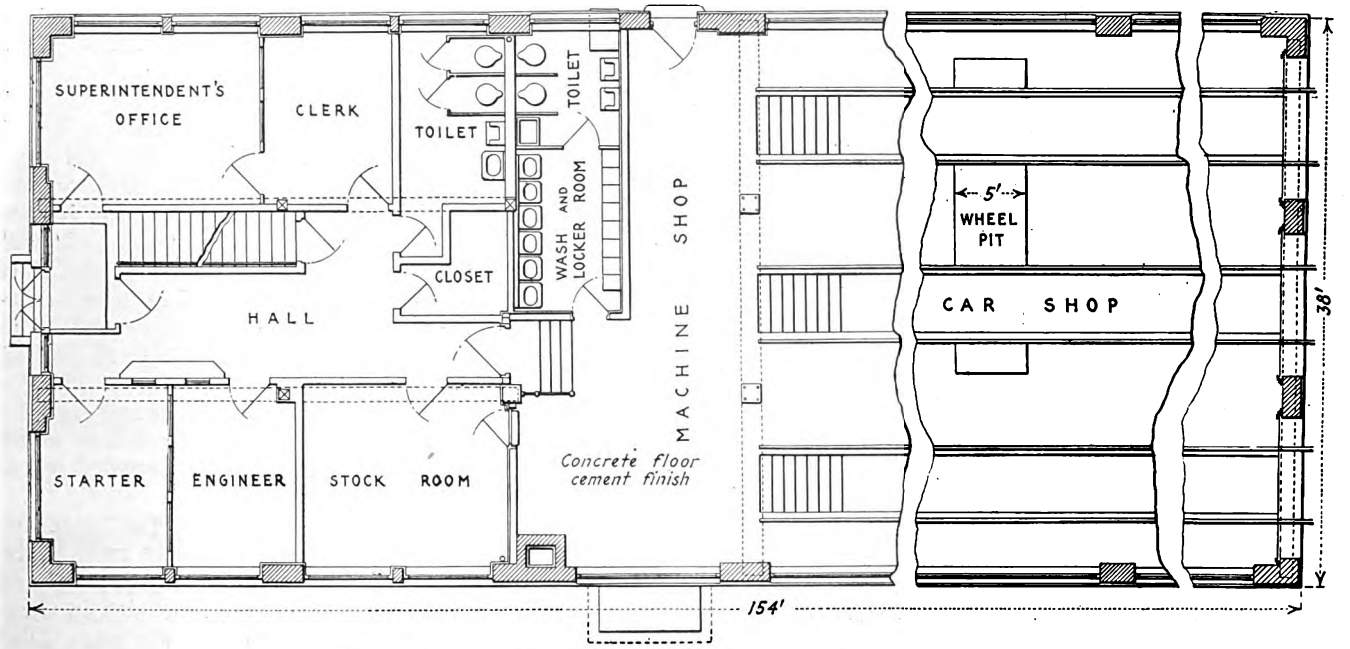


GENERAL PLAN OF FIRST FLOOR OF CAR SHOP AND OFFICE BUILDING

pany at 135th Street and Madison Avenue was laid out as the site for an open car-storage yard and a general administration and auxiliary maintenance shop building. This work is now complete and its salient features are covered in the present article. Construction work was begun July 1, 1921, and completed Nov. 1. The heavy maintenance work will continue to be done at the main shops mentioned above. These will be taken up at an early date in this paper.

ENGINEERING CONSIDERATIONS INVOLVED IN THIS JOB

The specifications which confronted the engineers in commencing the design of this layout were principally as follows:

1. A site of limited area and irregular form and bounded in part by the property of other owners was to be utilized to provide: (a) Storage space to accommodate the maximum possible number of cars; (b) a building of dimensions ample for general offices and a shop for light repairs and inspection, and (c) facilities for spotting cars into and out of storage and inspecting them in the yard without the use of the usual ladder tracks, for which no space was available.

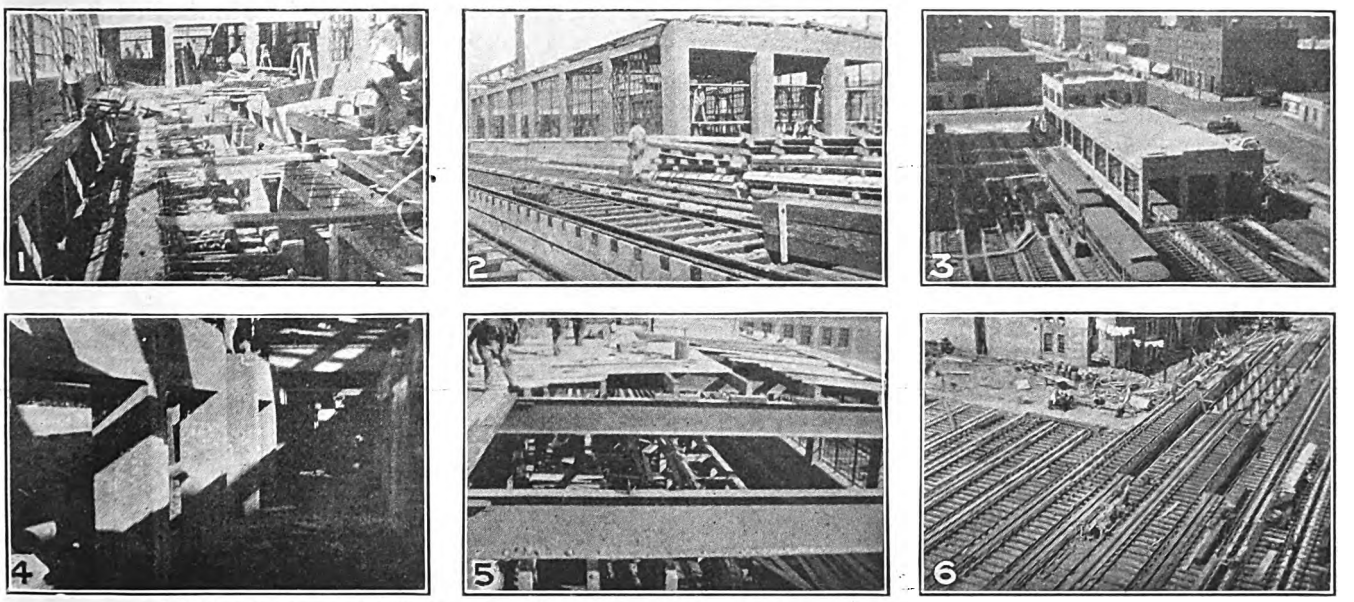
2. The complication of conduit and slot construction had to be reduced to a minimum in order to save cost and facilitate upkeep.

3. Provision had to be made for preventing tidewater from getting into the plumbing, the elevation of the site being low with respect to the high-tide water level.

4. Costs had to be kept down to the limit.

How these four specifications were met is explained in outline as follows:

The site consists of a rectangular southeast corner plot lying approximately 310 ft. along 135th Street and



CONSTRUCTION VIEWS OF ADMINISTRATION AND SHOP BUILDING AND YARD TRACKS, NEW YORK & HARLEM TRACTION LINES

No. 1—Pits in shop are provided by means of concrete beams and columns.
No. 2—Yard tracks are laid on concrete troughs.
No. 3—Liberal window space is provided in shop on north and south sides.
No. 4—Tracks over pits in shop are substantially supported.
No. 5—Shop roof is of mill type construction, supported on heavy I-beams.
No. 6—Even simplified conduit-track construction involves expensive supporting structure.

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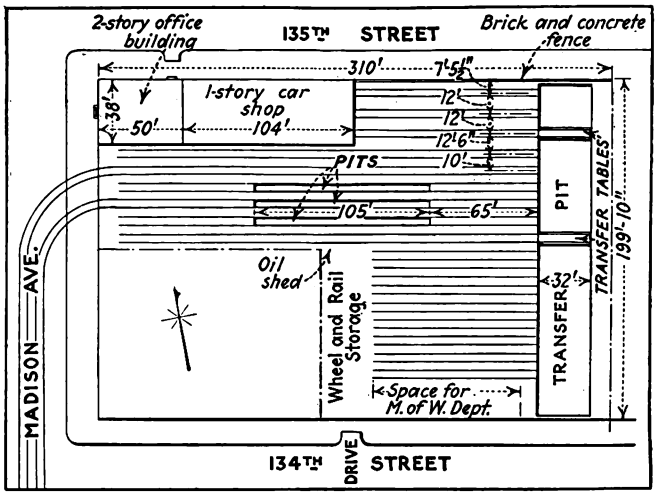


GENERAL PLAN OF NEW YORK & HARLEM RAILROAD PROPERTY, 135TH STREET AND MADISON AVENUE, NEW YORK CITY, SHOWING GENERAL OFFICE AND CAR SHOP BUILDING AND STORAGE AND INSPECTION CAR YARD

200 ft. wide at the rear. The frontage on Madison Avenue is 100 ft., a 100-ft. x 135-ft. plot on this front being owned by others. A space 38 ft. x 154 ft. was set aside for the building and the remaining space was laid out in tracks, transfer-table pit and materials storage areas.

The most capacious and economical track layout worked out was that shown in an accompanying illustration, with straight tracks and a transfer pit at the rear. This not only involved a minimum of special trackwork, especially desirable with slot construction, but at the same time it permitted the maximum of useful storage track.

The incoming main track and the adjoining two tracks were provided with pits more than 100 ft. long to permit routine inspection and obviate the transfer of cars to the shop tracks for trifling ailments. The main tracks were connected with those on Madison Avenue by means of A. E. R. A. standard spirals, so that standard turnouts can be installed in the street later if it is desired to connect up the company's tracks with the present tracks on Madison Avenue above 135th Street.

The transfer pit is similar in construction to that used elsewhere in New York City, but being in the open it had to be provided with ample drains through which snow can be flushed away. In these drains, as in the plumbing drains throughout, check valves were installed to keep out back water.

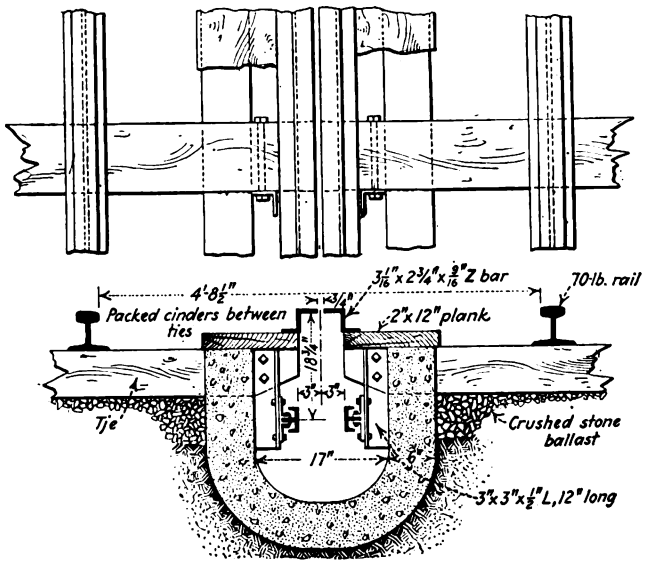
The really novel feature of this layout is the radical departure from usual practice made in the design of slot and conduit construction. While conduit railways in this country are confined to New York City and Washington, D. C., engineers will be interested in this detail as the solution of a complicated problem. It will be remembered that the main track rails and slot rails in this type of construction are mounted on heavy cast-iron yokes which are firmly supported on concrete. The contact bars are in turn mounted on insulators carried by the slot rails. A concrete conduit oval in form is molded to conform to the contour of the opening in the center of the yoke. Obviously such construction would be expensive and complicated in this crowded yard. Here is how its use was avoided:

Concrete troughs were constructed in the center of each track to take and protect the contact rails. The ends of the ties which extend across the devil strip and nearly half way across the gage were imbedded in these troughs. The spaces between the troughs were filled with crushed stone ballast, which assists in supporting the ties.

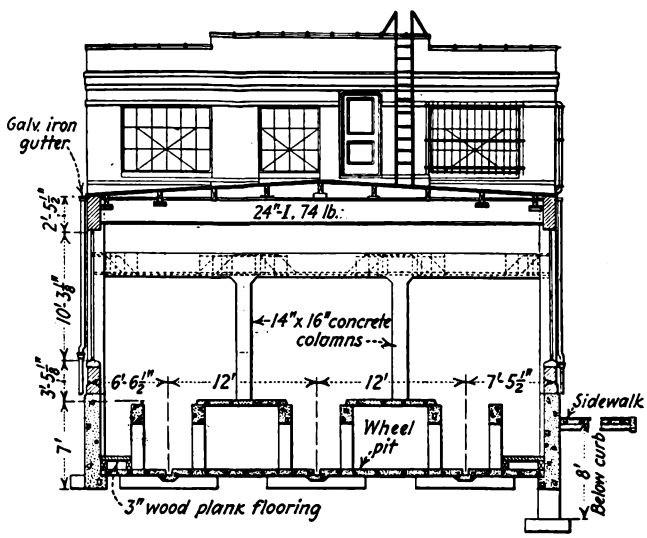
From alternate tie ends, extended for the purpose, the contact rails were supported by standard barn-type trolley hangers bolted to angle-iron brackets. Planks were spiked to the ties to protect the contact rails and support Z-bars which were spiked to them to form the slot. Some modifications in the construction were necessary on outside tracks and at the pits, as will be seen from the illustrations.

SIMPLICITY A FEATURE OF SHOP AND OFFICE BUILDING

Coming now to the building, it will be noted from the illustrations that it is of mill construction. This was used to avoid brickwork and to utilize standard sizes of steel sash. The main floor is on two levels, the front building being set high to minimize excavation and provide good light for the basement. The details of the building floor layouts are given in the line drawings reproduced, and need not be elaborated here. Suffice it to say that the layout has proved to be just what the management needed for administrative work, and the



DETAILS OF CONDUIT CONSTRUCTION IN SHOP AND YARD. CONTACT RAILS SUPPORTED FROM TIES



CROSS-SECTION OF CAR SHOP, SHOWING BUILDING AND CERTAIN CONSTRUCTION DETAILS

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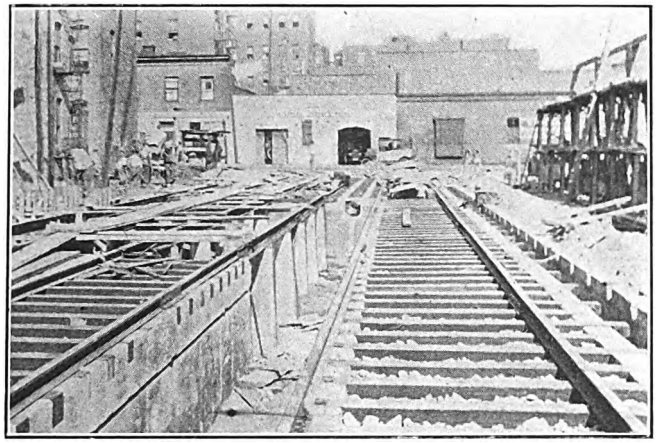

VIEW IN YARD SHOWING CONSTRUCTION FOR SUPPORTING TRACK AND PROVIDING CONTACT-RAIL SUPPORT

manager can overlook, from the second floor, the operation of the cars in street and yard.

In the shop there are the standard facilities for changing wheels, armatures, etc. A photograph has been reproduced to show the method used for handling and storing armatures. Another shows a four-wheel trolley which is used for power supply to the cars in the shop. It is made of ordinary trolley wheels carried on a light frame, and rolls on angle-bars hung on barn-type insulators from crossarms. These bars also serve as a source of power for lights, etc., the simple two-wheel trolley shown in the illustration being used as the contact device for this purpose.

One end of the shop space is reserved as a machine shop, where simple tools such as drill press, emery wheel, etc., are provided. One-half of the floor space is occupied by pits under the three tracks. The pit construction consists of heavy concrete longitudinal beams cast solid with the columns.

The work was done under the general direction of H. L. Pitner, engineer of way and structure, with the co-operation of J. F. Uffert and W. B. Uffert of the equipment department. James Stewart & Company were the contractors for the building.

A Handy and Effective Welding Shield

FOR a welding shield to protect pedestrians from the glare of the electric welding arc, the Milwaukee Electric Railway & Light Company has devised an ingenious box to displace the more common fence-type shield. This box shield is made of ⅜-in. asbestos board and is about 8 in. wide by 8 in. deep by 24 in. long with an open bottom and a slot in the top extending the full length along one side. The opening in the top is sufficient to permit a free manipulation of the metal electrode which is inserted through the opening into contact with the point at which it is desired to build up the metal. The box does not cut off the operator from a free circulation of the air as the old type shield does. It is deep enough to prevent the glare of the arc reaching onlookers, and as it is equipped with a handle it is very readily picked up and carried from one welding point to another.

WELDER USING ASBESTOS BOARD BOX AS A SHIELD

Don't Lose Sight of Money Invested in Maintenance Materials

Shop Forces Accustomed to Seeing Large Quantities of Material in Storage Seldom Realize Its Value and May Become Wasteful and Inefficient in Applying It

SOME of the advantages of a perpetual inventory or stores control are pointed out in a bulletin just issued by the Fabricated Production Department of the Chamber of Commerce of the United States.

When capital, says the bulletin, is in the form of cash it is carefully protected, its receipt and disbursement safeguarded, its custodians held to a strict accounting, but once this capital is converted into materials there is a tendency to become lax, to lose sight of the value of the investment, to husband the capital less diligently, to tolerate practices that are wasteful, inefficient and needlessly expensive.

There is something at fault with business methods when material is purchased far in excess of requirements, when material becomes obsolete before it is needed, when material is not protected or kept accessible for use and when foreman and workmen help themselves without authorized requisitions or when material is consumed without any record for cost purposes.

An efficient stores or perpetual inventory system, and that alone, will provide: (1) Sufficient material to meet requirements so that production shall at least not be checked by a lack of necessary material; (2) a minimum investment in inventories which is of supreme importance at the present time; (3) an orderly and accessible arrangement of material and the physical safeguarding of material from the elements and theft; (4) the elimination of the burdensome and inaccurate annual physical inventory; (5) a monthly closing by giving the amount and value of material on hand at any time; (6) an invaluable record in case of fire loss, and (7) a safeguard against the accumulation of obsolescent material.

The control of material does not end with the storeroom or its record; to a large degree the success of a stores control system will depend on the co-operation of foremen and workmen. In particular the foreman can directly help the control of materials by avoiding congestion in the departments, by protecting material in the departments against breakages and thefts, by assisting in the proper distribution of material to their men, by seeing that the men get the quantity of material ordered, by ascertaining that material is skilfully handled in the departments and when processed that it is promptly and properly transferred.

The little waste, a nut here, a bolt there, each inconsequential in itself, is serious in the aggregate. The foreman can effectively co-operate by husbanding the consumption of such material, the requirement for which can only be estimated and not always expressed with exactitude. These include supplies such as oil, waste, paint, greases and solder, and fittings and fastenings such as bolts, nuts, screws and rivets.

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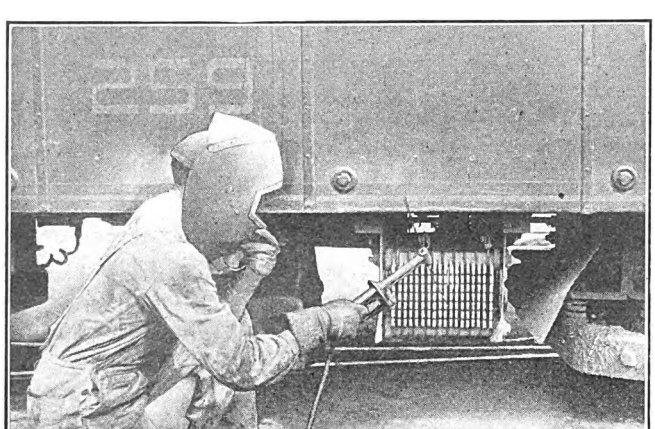
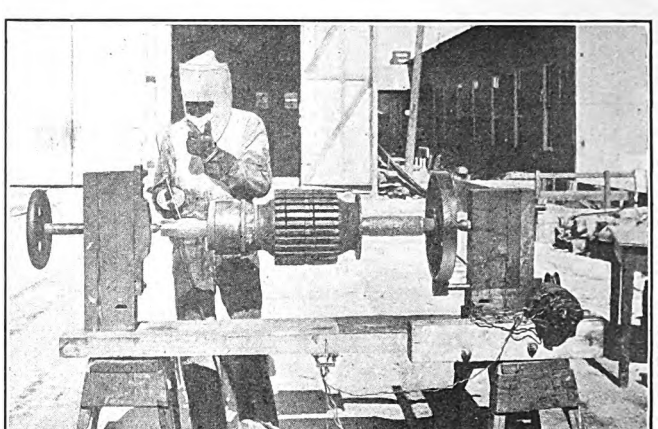


WELDING RESISTOR GRIDS WITHOUT REMOVAL FROM THE CAR



EARLY EXPERIMENTAL TYPE OF WELDER USED IN SAN ANTONIO

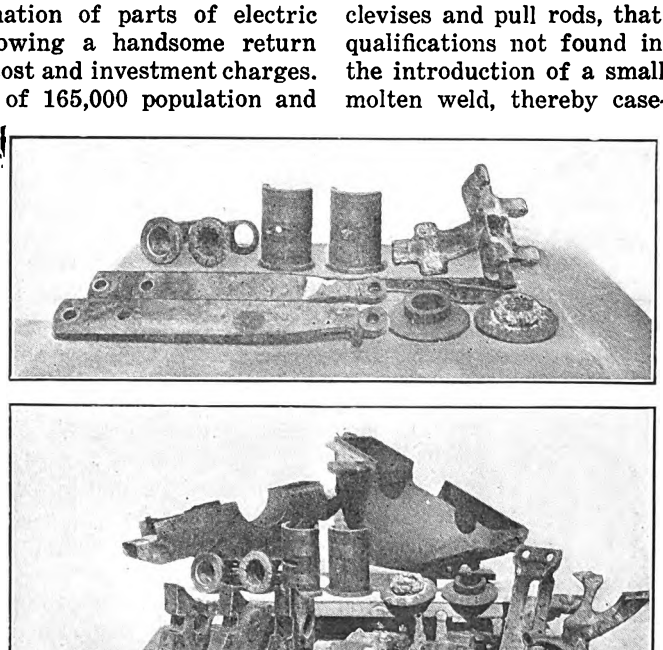
Arc Welding in Railway Shops

Repairs to Rolling Stock Equipment Can Be Frequently Made Without Removal from Cars So that Large Savings in Both Labor and Material Result

BY S. E. MASON
Superintendent of Equipment San Antonio (Tex.) Public Service Company

ELECTRIC welding in the shops of the San Antonio Public Service Company began in October, 1918, with a home-made electric welder of the resistance type giving a variation of from 77 to 200 amp. in five steps across the trolley supply, as shown in an accompanying schematic diagram. This machine was superseded by a motor-driven 175-amp. electric arc welding equipment in September, 1920. Since then we have evolved a routine of reclamation of parts of electric car equipment which is showing a handsome return over and above its operating cost and investment charges. This property serves a city of 165,000 population and operates a total of 175 passenger motor cars over 95 miles of track. Of these cars ninety-six have single trucks and the remainder are heavy double-truck cars.

Our records show that by the use of the electric welder we have saved an average of $1,308.13 a month. This makes an annual saving of $15,697.58, which we believe is a wonderful return on the investment, as the single-operator unit cost us approximately $1,000 installed. In other words, the outfit has more than paid for itself every month. I am sure that the actual figures as taken from our records will be of considerable interest to other railway companies. These figures are given in the accompanying tabulation. An explanation of the headings of the columns and the method of obtaining the various information is necessary to check the correctness of the figures. The "Per Cent Condition After Weld," second column, indicates the per cent of life expected after repairs by electric welding, the life of a new article being considered 100 per cent. It will be noted that in some instances the per cent condition after welding is above 100. The explanation is, for instance, in the case of clevises and pull rods, that the method of welding adds qualifications not found in the original article, due to the introduction of a small per cent of carbon into the molten weld, thereby case-hardening and resulting in a longer life than could be expected from a new part.



SAMPLES OF REPAIR BY ELECTRIC WELDING
These groups of articles repaired by electric welding represent five different classes of metals.

The welder's time in making the weld (column 3), the machinist's time in machining the weld (column 4), and the materials used (pounds of welding iron, column 5) combine to give the total cost of reclamation (column 6), neglecting current and overhead. Column 7 shows the cost of the new part. The saving indicated in column 8 is found by taking into consideration the per cent condition after welding. The number of parts repaired per average month (column 9) multiplied by the saving on each part shows the saving per month (column 10).

A large saving of $207.48 is credited to "changing core" and "per cent winding saved" in labor and material. It is interesting to

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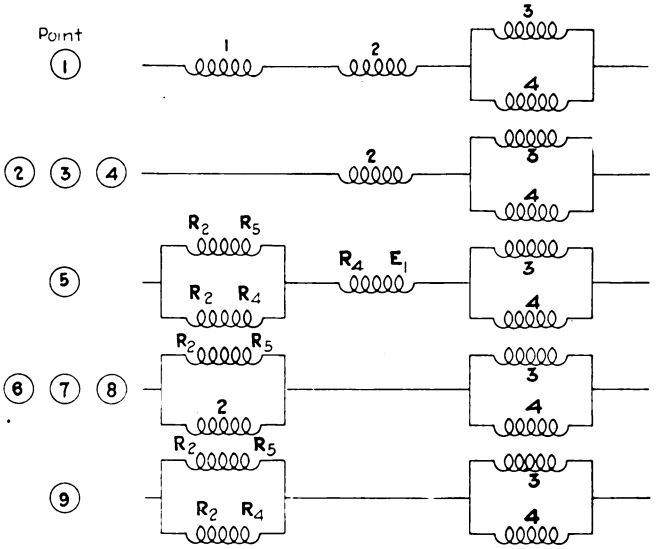
note how this is accomplished. In welding worn journals or armature shafts we remove the complete armature and place it in a lathe. The metal electrode is then placed in a position corresponding to the tool chuck and the armature is revolved. The electrode deposits the necessary metal on the shaft very evenly in spiral form. After the metal is deposited, the electrode is removed, a tool is inserted and the shaft journal bearing is machined to the proper diameter. This eliminates the necessity of removing the core or winding from the shaft and therefore is properly credited to the saving in welding. This method of spiral application was evolved after we experienced trouble with warping of shafts when placing metal back and forth parallel to its length. It also makes a much smoother finish as it is comparable to machine welding.

The machine shown in the illustration with the welder building up the armature shaft is one we used in the earlier experimental stage, and although it has considerable merit, it is limited in its possibilities. The present machine is located in a narrow space and is inaccessible for photographing. This new machine has a shop-made lathe especially adapted. Another illustration shows a close-up of a spiral weld on an armature shaft.

We recently had an accident with a 10,000-kva. turbine due to the dropping of the spindle which cracked the lower half casting of the front turbine bearing. This was readily welded by bringing in the electric arc welder from the carhouse. Because of the small tolerance between the moving and stationary blades, other methods of welding would have undoubtedly caused warping to such an extent as to be inadaptable; further, preheating necessary to other welding methods would have been practically impossible.

The illustration of a welder repairing a broken grid without disturbing the resistor demonstrates how repairs may be made on broken parts without removing them from the car. In this case cost of labor to remove,



SCHEMATIC DIAGRAM OF CONNECTIONS FOR EARLY RESISTANCE TYPE ELECTRIC WELDER

Point	Volts	Ohms Resistance	Amperes
1	525	6.780	77
2-3-4	525	4.068	129
5	525	3.842	136
6-7-8	525	2.917	180
9	525	2.625	200

Article reclaimed	Per Cent Condition After Weld	Welder's Time, Hours	Machinist's Time, Hours	Material, Pounds	Total Cost	Cost New	Saving	No. Used per Month	Saving per Month
Worn gear and wheel seats on axle	80	6	4	5	$9.75	$27.52	$10.02	2	$20.04
Worn journals on armature shaft	95	5	4	4	8.42	17.50	8.21	6	49.26
Changing core, etc	100					3.43	3.43	6	20.58
Per cent winding saved	80					119.20 M.32.72	31.15	6	186.90
Brake shoe heads No. 136666 caps	80	2	2	3	4.11	5.45	1.35		
Swivel for trolley base	90	1½	½	1	1.94	9.66	6.75	2	13.50
No. 119763 pole socket body for trolley base	90	3	1	1	3.66	7.44	3.04	1	3.04
Swing link bottoms	90	½		½	0.54	1.22	0.56	5	2.80
Clevices and pull rods	110	½		1	0.65	5.00	4.85	1½	7.28
Worn key way in armature shaft pin seat	85	½	3	1	3.44	17.50	14.88	2	29.76
Thrust 512-A armatures	80	½	½	½	1.67	4.09	1.60	3	4.80
Thrust 200 armatures	80	½	½	1	1.67	5.40	2.65	2	5.60
512-A thrust rings	95	½	½	1	0.86	2.11	1.14	10	11.40
GE-54 thrust collars	95	½	½	1	0.86	5.11	3.99	15	59.85
K-28 check pawls	80	½			0.43	0.59	0.04	2	0.08
27-G1 side bearings	100	1			1.50	3.09	1.59	5	7.95
GE-54 dope cuplids	90	½			0.43	0.13	0.31	4	1.24
M-33 door castings	90	½			0.86	1.54	0.53	1	0.53
1171-F door castings	90	½			0.43	1.45	0.88	3	2.64
4767 door castings	90	½			0.43	1.68	1.08	1	1.08
1106-M door castings	95	½			0.64	5.19	4.29	3	12.87
Step casting levers	85	½	½		0.29	0.76	0.36	12	4.32
Draw bar carriers	90	½			0.43	2.36	1.69	1	1.69
Space block for equalizing spring	80	½	½		0.64	3.85	2.44	8	19.52
4387 brake head shoe bases	100	½		3	1.32	3.86	2.54	1	2.54
Light load coil spring seat	80	½		1	0.65	2.43	1.29	½	0.32
AS-956 seat arms	95	½			0.29	0.62	0.30	1	0.30
AS-962 seat ends	100	½			0.65	0.80	0.15	1	0.15
Seat supports	100	½			0.43	0.67	0.24	1	0.24
Dowel pin holes in axle bearings	85	½	½	½	0.98	9.13	7.76	6	46.56
Hinge on gear case lids	95	½			0.43	0.75	0.29	3	0.87
Lug on trolley catchers	80	½		½	0.49	1.54	0.74	1	0.74
K-12 controller cap	80	½		½	0.91	4.69	2.84	1	2.84
K-12 controller frame	80	3		1	3.58	25.00	16.42	½	4.10
GE-54 armature bearing dust covers	110	½			5.68	5.54	0.41	40	16.40
Bore of 512 axle gear	50	4	4	3	7.55	31.69	8.30	1 12	0.69
Axle bearing caps, dowel pins, 92-A-512-A GE-200	85	¼	¼		0.93	6.62	4.70	3	14.10
Patch gear case halves 54-92-A-512-200	75	1		2	1.11	18.62	12.85	45	578.25
Journal boxes	95	1		1	1.86	9.00	7.69	1	7.69
Air valve stems	100	1		½	1.59	4.20	2.61	15	39.15
Enlarged hinge pin holes in brushholders	80	¼	¼		0.43	5.34	3.84	10	38.40
GE-54 top motor case	95	5		2	4.74	49.31	42.10	½	21.05
Build up armature core key	50	½	1	½	1.59	52.69	24.75	1	24.75
Build up commutator shell seat	50	2	2	1	3.55	17.50	5.20	1	5.20
Weld loose farebox brackets	95	½			0.21	0.86	0.61	10	6.10
Drill shanks (average ¾)	50	½	½		0.43	1.47	0.30	6	1.80
Broken truck braces	90	3		25	4.05	4.37	10.30	1	10.30
Resistance grids	100	1/12			0.07	0.51	0.44	7	3.08
Air reservoir	100	2		½	1.83	13.23	11.40	¼	2.85
Standard brake shoe heads	75	1		½	0.97	2.44	1.47	9	13.23
									$1,308.13

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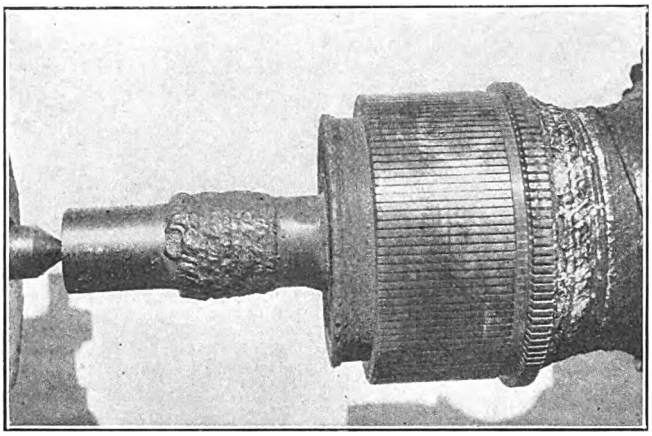
dismantle and reassemble the resistor is much higher than the material costs. The method used not only saves in material costs but the major portion of labor costs is saved as well. A few of the typical reclamations of parts worn, welded and machined are shown in two other illustrations. Five different classes of metals are shown in these groups.

Each method of welding assuredly has its particular field and the success of the finished job depends upon



A SPIRAL WELD ON AN ARMATURE SHAFT

the judgment of the welding engineer as to whether the thermit, electric or oxyacetylene process should be used. However, there is no type of welding that has as wide a range as the electric, which can be adapted to almost any job, irrespective of size or metals, and as for speed, costs and quality of finish, it is without an equal.

Maintenance Kinks from Little Rock

W. H. CURTIS, master mechanic Little Rock Railway & Electric Company, has rigged up a number of ingenious devices which help the repair work done in the shops of that company. One of these is an air brake valve grinder. Formerly these valves were ground by hand and the process took about an hour and a half. Now they are ground by electric power in about thirty minutes and the machine requires no attention while the valve is being ground. The valves to be ground are bolted to the vertical side of the work bench, and the grinder, which is of the kind used for grinding automobile valves with a rotary motion but with reversing movement, is set in an adjustable frame over the valves to be ground. The grinding machine is then driven by a small electric motor through a wooden pulley and belt.

Another adaptation of electric drive to work formerly done by hand is the winding of resistances for type E air governors. In this case an old sewing machine frame is used for the frame of the winding machine. It is driven by a former fan motor which is belted to the shaft of this improvised winding lathe. A resistance spool can now be wound in ten minutes instead of in an hour and a half. The fact that the shops are equipped with 110 volts permits the use of the fan motor without resistance.

Like many other shops in the country, those at Little Rock make extensive use of electric welding in repair work. During a recent visit to the shop by a representative of this paper, Mr. Curtis pointed out a pile of brake shoe heads whose center and end seats had been built up by arc welding. The practice results in a saving of about $1.50 per brake shoe head over a new head or a saving of about $350 a year, as 200 new heads otherwise would have to be purchased.

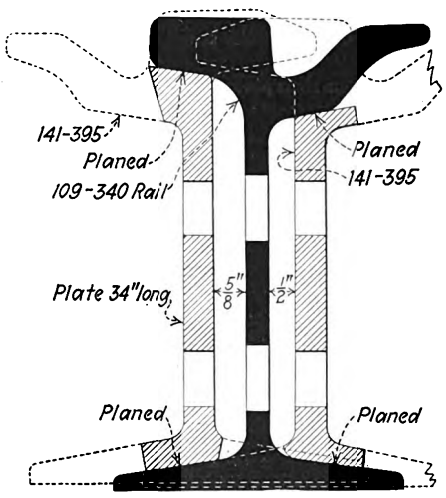
Some time ago the company changed over the method of armature shaft and motor journal bearing lubrication of some of its G.E.-57 motors so as to decrease the amount of oil used and increase the period between oilings. The plan followed was simply to increase the size of the oil wells by welding on top of the well a section about 4½ in. long of square shaped boiler tube about 3 x 3 in. The tops of these enlarged oil wells are then fitted with the usual spring cap. This method was described in the ELECTRIC RAILWAY JOURNAL for May 7, 1921, page 861, and now the motors on ten cars have been fitted in this way. The oil well is packed with waste and its enlarged capacity for oil enables a car to run for ten days or 1,000 miles without reoiling. Then less than a gill is required per bearing.

The company is still using sheet metal ceilings in its cars and finds them cheaper in first cost and maintenance than veneer, the material formerly used.

Worn-Out Rails Cut Down to Make Joint Plates

THE Market Street Railway, San Francisco, has recently made up about 100 pairs of joint plates from worn girder rail that had been taken out of service to be scrapped. By a comparison of cross-sections it was found that joint plates suitable for 109-340 (Lorain) rails could be cut from the 141-395 (Lorain) rails that had been worn out on this system.

The shaded sections on the accompanying illustration represent the portions of the old rails utilized and the solid section represents the 109-340 rail on which they are used. Each plate consists chiefly of the web from the worn rail from which parts of the base, ball and lip have been cut away with the oxyacetylene torch. Four oxyacetylene cuts are required, two on the head and two on the base, to make each plate. With the piece



SECTIONS SHOWING HOW PARTS OF SCRAP RAIL ARE USED FOR JOINT PLATES

roughly cut out in this way, two surfaces on each plate are planed to insure exact size and smooth fit against base and ball of rail respectively. The bolt holes in the web are then drilled in the usual way.

This method has been found to provide joint plates of very good quality at low cost. The plan was worked out by W. D. Chamberlain, assistant chief engineer Market Street Railway.

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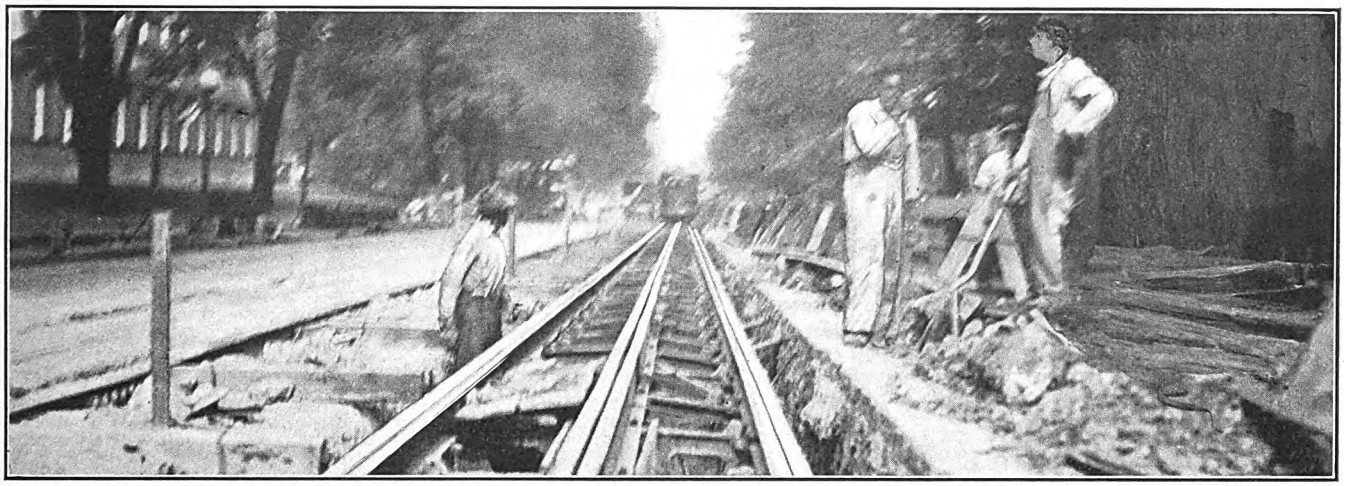
Installing Shallow-Conduit Construction in Washington

The Capital Traction Company Uses a Large Number of Pneumatic Tools in Replacing the Old Type of Deep Tube Cable Construction with New Shallow Tubes

BY D. E. DUNN
Ingersoll-Rand Company, New York, N. Y.



TRAFFIC CONTINUES THROUGHOUT THE OPERATION

MOST electric railway men are more or less familiar with the underground conduit track construction used in Washington, D. C. But probably very few, except those who have actually worked on this type of construction, realize the difficulties of excavation on renewal work of this kind without interfering with car operation.

The Capital Traction Company of Washington, D. C., has been very busy the past few years renewing completely the old deep tube cable road construction which was installed in 1891-1892. As its name implies, it was a cable road, so operated until 1898. During 1898-1899 the entire system was electrified, the conductor bars being placed in the same tube that was used for cable operation.

In 1901 several extensions were built and a shallow tube construction adopted as standard. This type has a yoke spacing of 5 ft., which did not allow of its being used for renewal of cable construction. The result was that a new type of shallow tube construction was designed with a yoke spacing of 4 ft. 6 in., which has since been used for complete renewal of the old deep tube cable work.

The old tube concrete was a 1-2-4 mixture, using 1-1½-in. crushed stone as aggregate. Needless to say, it was, and still is, hard concrete. Even after the twenty or more years since it was installed and subjected to heavy car traffic day after day it is still in first-class condition. During excavation work it is a common sight to see the stone itself split rather than the bond give way.

Prior to 1917 all excavation work was done by hand, using a 1¼-in. round steel to a depth of a few inches and then splitting off the concrete with 3 in. square bull-points. There was not a great deal of renewal work in those days, and labor was cheap, so that method answered very well.

However, in 1917 the company purchased its first portable air compressor, an Ingersoll-Rand Imperial XII machine and two "jackhamer drills." These tools did excellent work, so the following year two tie tampers were purchased, not, however, to tamp ballast, but to be used with chisel bits for cutting out the asphalt pavement, trimming out yoke holes, etc.

In 1919 an outside contractor rebuilt some track and brought with him a home-made portable compressor, consisting of four car compressors and four tanks, mounted on a low-wheeled truck. The Capital Traction Company purchased two more "jackhamer drills" for that job, taking them over when the contractor had completed his work. He, of course, took his compressor back with him, so the railway then had on hand several more tools than it had air equipment to operate them.

In 1920 the railway built two compressors similar to the one the contractor had, and then purchased three more tie tampers. These additional compressors and tools proved very satisfactory, so in 1921 another compressor was purchased. This was a Westinghouse Traction Brake Company's type E-4 machine, and to date eight Ingersoll-Rand type CC-25 concrete breakers and two Little David sand rammers have been added to the equipment.

The first two of the concrete breakers were received on March 28, and they proved so satisfactory that the "jackhamer drills" and tampers were gradually replaced with the CC-25s. These tools are just what their name implies—concrete breakers, in every sense. One wonders, while watching them in use, how people ever got along without them in the years past, particularly in excavation work such as is necessary in Washington.

The first complete rebuilding job of any extent was Pennsylvania Avenue from Second Street to Seventh Street, Northwest, in 1912. The following year Pennsylvania Avenue was rebuilt from Ninth Street to Fif-

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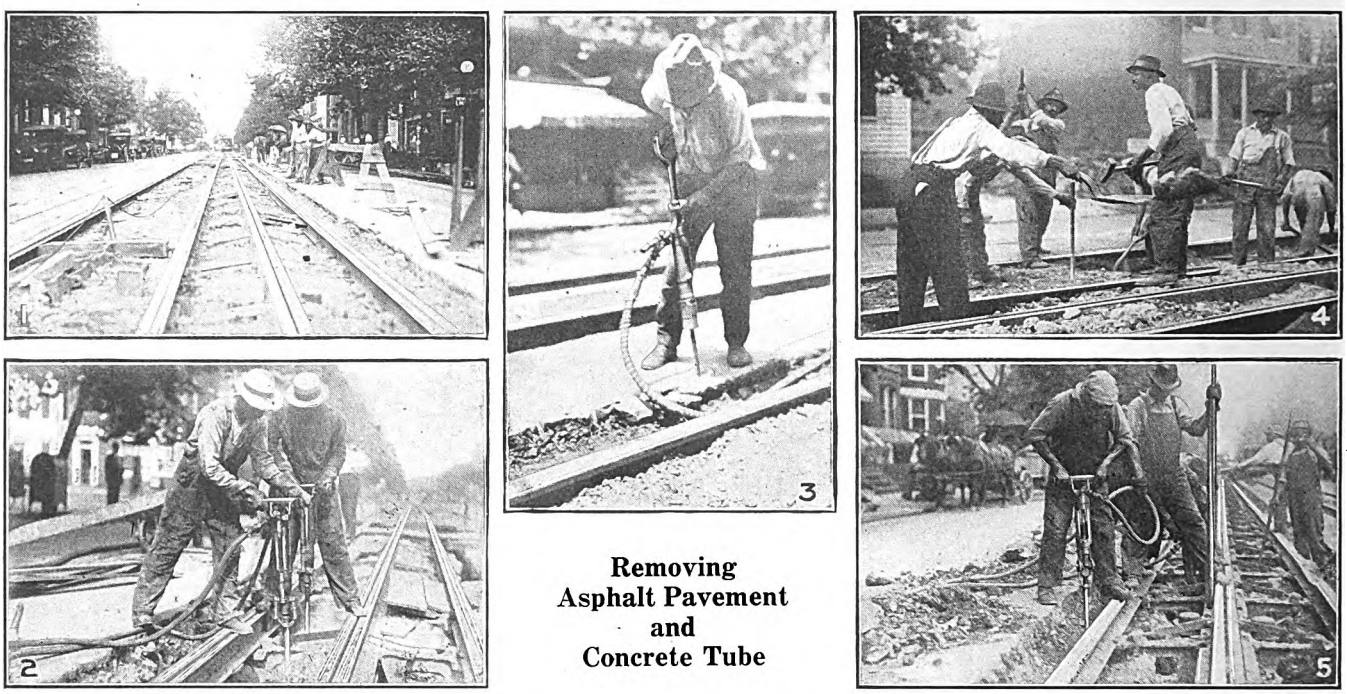


Removing Asphalt Pavement and Concrete Tube

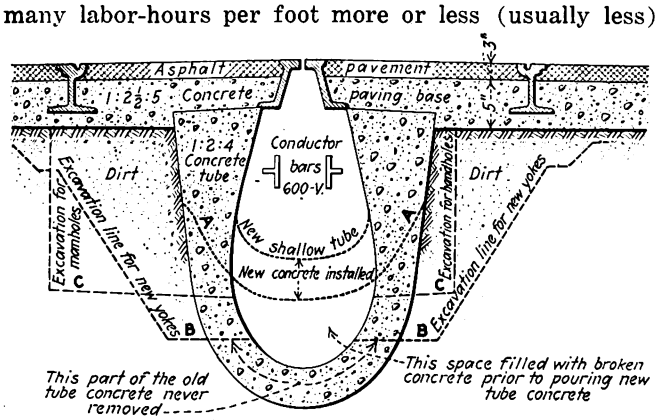
No. 1—First stage of reconstruction after asphalt is removed.
No. 2—Operators loosening and breaking up concrete tube.
No. 3—Cutting away asphalt with tie tamper.
No. 4—Removing concrete by the hand method. Gang consists of three strikers and one chisel holder.

No. 5—Working in close quarters with a pneumatic tool. The wooden paddles shown are used to safeguard the worker, so as to make certain that the tool does not come in contact with any live parts of the conductor bars. In operation one workman holds the paddle between the conductor bars and the tool.

teenth Street, Northwest. Costs per foot of track were carefully watched and compared from day to day, and it was thought at the time that these jobs were very economically completed, and, until about 1916, they were used as a basis for comparison on complete rebuilding jobs.

But owing to varying wage scales, a fair comparison was hard to obtain without a great deal of work, as the only way to obtain the actual man-hours expended was by going through all the time books and picking out the labor on each phase of the work. Even this would not have been very accurate.

In 1919, however, this company instituted a new system of cost keeping, which is all that could be wished for. Not only are the actual costs kept on every phase of the work, but also the labor-hours, foremen and laborers being separated. Thus, no matter what the wage scale, a comparison of labor-hours per foot of track is always available, and this is really what is wanted. The railway officials now speak of a job as requiring so many labor-hours per foot more or less (usually less) than the preceding job, instead of costing so much more or less.



CROSS-SECTION OF TUBE CONSTRUCTION, SHOWING EXCAVATION NECESSARY FOR RENEWAL WORK

By digging through many old-time books, a fair average hourly wage for the excavation gang during the years 1912-13-16-17 and 1918 has been obtained and, knowing the cost per foot of track of excavation on the various jobs, the approximate labor-hours per foot have been computed.

The accompanying table gives such data and also the number of air tools available at the time the various jobs were under way. These figures are for excavation only, and do not include any costs of hauling excavated material away from the jobs:

LABOR COSTS AND HOURS PER FOOT OF SINGLE TRACK FOR EXCAVATION ONLY, AND AIR TOOLS AVAILABLE AT THE TIME

(Figures include excavating through paving base on one-half the dummy)

Year	Per Ft. Cost	Single Track Hours	Air Tools Available for use
1912	$1.81	10.45	None
1913	1.56	9.12	None
1916	1.33	7.10	None
1917	1.62	7.08	Two "jackhamer drills"—50 per cent of the time
1918	2.47	7.49	Two "jackhamer drills"—Two tie tampers
1919	3.30	8.08	Two "jackhamer drills"—Two tie tampers
1920	3.49	7.78	Four "jackhamer drills"—Six tie tampers
1921	1.70	4.46	Two to six concrete breakers—Two tie tampers

Figures don't lie; therefore, according to the foregoing table, air tools did not effect any saving until this year. But, stop to consider the quality of available labor during the war, the heavy increase in car traffic, and numerous other conditions that made this sort of work much more difficult, and then wonder that the labor-hours did not almost double.

This year, however, labor has improved in quality, and certainly in quantity, and the CC-25 concrete breakers made their debut; the result is a decrease of about 40 per cent in the cost of excavation on this work.

So far, the discussion has been confined to straight trackwork. Needless to say, pneumatic tools are even

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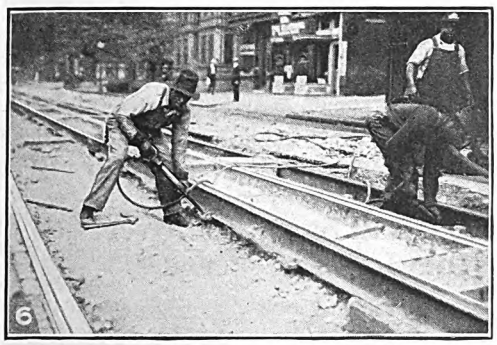
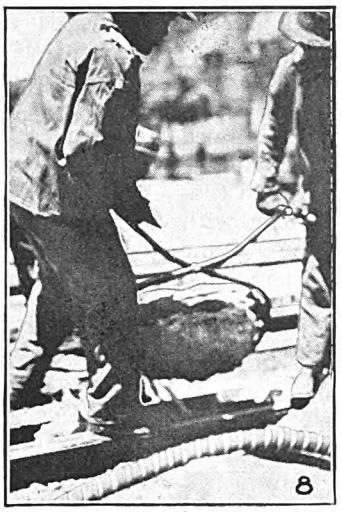
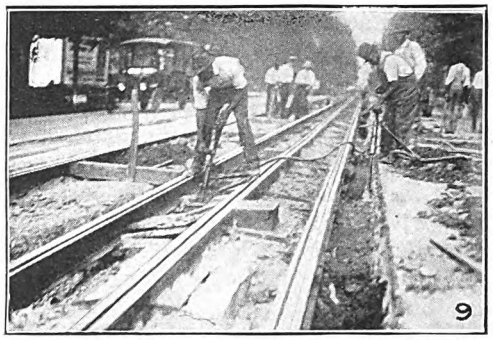
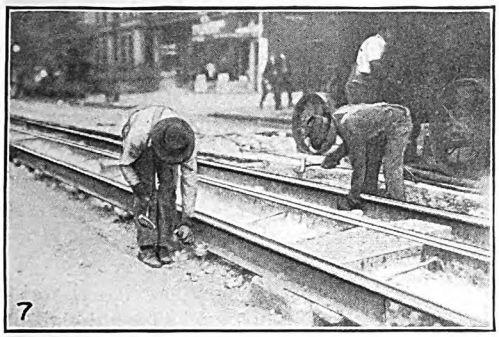
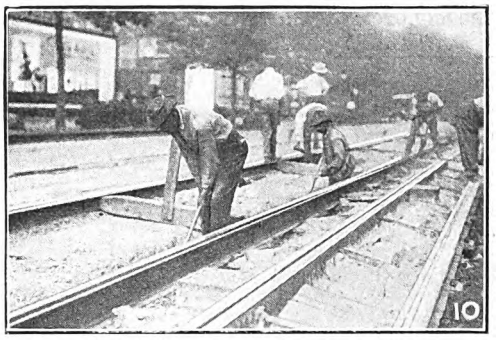










Replacing Rails and Loosening Earth for New Construction

No. 6—Machine method facilitates chipping off boltheads.
No. 7—Hand method of chipping off boltheads previously used.
No. 8—Special tongs used to lift large chunks of concrete after they are broken off by the paving breaker.
No 9—Tie tamper equipped with spade point loosening compact earth.
No. 10—Hand method of loosening dirt which has been replaced by machine methods.

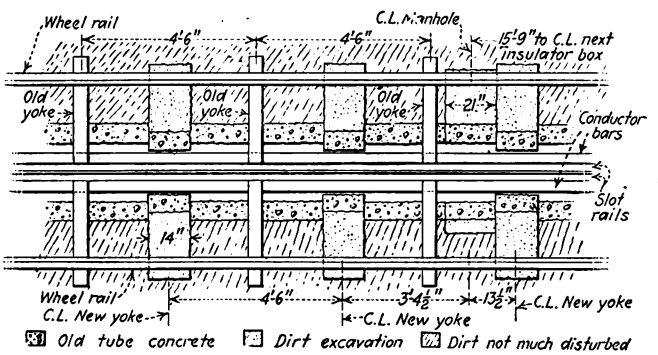
of greater value in excavating for special trackwork renewals, where the concrete is much heavier and much more difficult to remove.

Several small tools, such as scoop-shaped hoes, tongs for large lumps of concrete, etc., which are made in the railway company's shops, have also materially aided in removing the broken concrete from the bottom of the tube and have helped to reduce the costs of excavation.

The accompanying illustrations will give a rather complete idea of the extent and nature of the excavation work recently carried out at Fifth and G Streets. By referring to the cross-section of the tube construction, it will be seen that in order to provide for the new shallow tube, it is necessary to remove asphalt pavement, concrete paving base, and a large part of the old concrete tube. In order to provide for manholes and new yokes, it is also necessary to excavate and remove a considerable amount of dirt outside of the concrete tube. In such reconstruction the first work is the removal of the asphalt pavement.

For breaking up the asphalt two air-driven tools were used, first a pneumatic tie tamper, which was later discarded in favor of CC-25 paving breakers. An Ingersoll-Rand 6-in. x 6-in. type 14 portable gasoline-driven compressor outfit will furnish sufficient air to operate two paving breakers working continuously. The crew for such a job consists of three men, one compressor man and two operators. It is usual for the compressor man to be in charge of the crew and he relieves the operators from time to time. In order to confine the removal to definite lines so that there is no waste from removal of material not required, the first operation is what is termed "marking" the asphalt. This operation consists of driving the chisel bit through the entire thickness of asphalt at intervals of about 3 in. to 4 in. along a line which is to mark the extent of the asphalt to be removed. At the point where the removal of asphalt is to commence the end is also marked. The chisel is then driven nearly vertically through the full thickness of the asphalt and it is then slid along under the asphalt so as to break it up into pieces about 12 in. x 18 in. The asphalt is practically "peeled" off the concrete base by this operation. The broken pieces of asphalt are removed by hand and are piled up out of the way for removal. The paving breakers are rugged, all steel machines, the principal parts being drop forgings, so as to stand severe usage and hard work. The chisel used for marking and breaking up the asphalt pavement has a width at the cutting edge of 3 in.

The next work consists of the removal and breaking up of the concrete paving base, which averages from 5 to 6 in. in thickness. A moil point steel tool is substituted for the chisel in the paving breaker. This is driven through the concrete sub-base at about the middle of the trench. This spalls off an irregular V-shaped piece. Then two or more cuts are made, which remove the remainder of the concrete along the line. Chunks of considerable size are thus broken off, and in order to facilitate the handling of these the Capital Traction Company has made some tools which consist of tongs that will grip the chunks of concrete and which have handles so that the lumps can be handled by two



PLAN VIEW OF COMPLETED EXCAVATION, OLD DEEP TUBE CABLE CONSTRUCTION REPLACED WITH STANDARD

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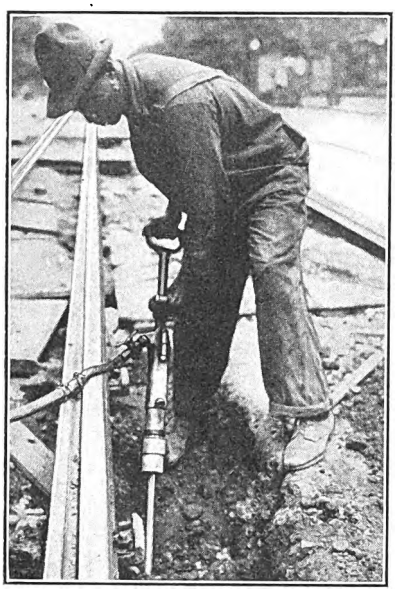
men. An accompanying illustration shows this process. Also for comparison illustrations are given showing the removal of concrete by the old hand method where a gang of three strikers and a chisel holder were necessary to break off the concrete. The saving to be gained from employing machines over hand methods on similar work in track where there was no conduit slot to contend with is illustrated by the fact that a man with a paving breaker averaged 14 cu.ft. per hour, while with the hand method the rate per man per hour was but 2⅓ cu.ft.

Following the gang which breaks up and removes the concrete is another which chips off bolt heads and cleans the concrete from the face of the rail. Two men perform this work, one for each rail, and they each operate a 56-H Little David pick. The same compressor which is used for two paving breakers will operate two of these Little David picks. This would seem to overload the compressor, but such is not the case, as all of these tools operate intermittently. The same tools are used to remove the concrete which adheres to the rails. An accompanying illustration shows the old method of chipping off boltheads by hand. After removing the concrete and in order to provide sufficient excavation for installing new yokes and for manholes and handholes, it is necessary to loosen and remove some dirt. The soil is very compact, and for loosening this old tie tampers equipped with spade-pointed steel tools are used.



CLOSE-UP VIEW OF OPERATION OF LOOSENING COMPACTED SOIL WITH SPECIAL SPADE POINTED STEEL TIE TAMPERS

After the old yokes are removed from the roadbed new yokes are put in place and concreted in as shown in the accompanying drawing and the street is finally repaved with asphalt. The actual amount of material excavated varies from 35 to 40 cu.yd. per 100 ft. of single track including one-half the dummy, about 25 cu.yd. of which is concrete. The Capital Traction Company now has about $10,000 worth of portable compressors and pneumatic tools, and the officials consider this a very profitable investment.

Obsolete Rail Saw Made Over Into Rotary Planer

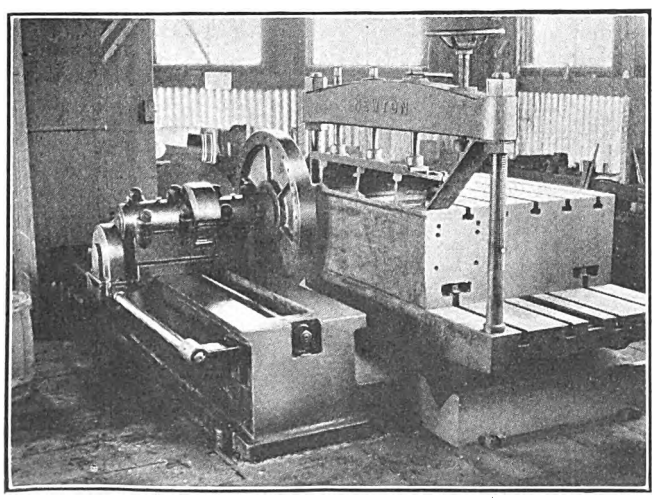
SINCE the advent of the oxyacetylene process a Newton rail saw in the shops of the Market Street Railway, San Francisco, has not been used for the original purpose of cutting special trackwork, etc., and has been classed as obsolete equipment. The device is a power-driven circular saw designed for heavy duty and substantially built. It was found that with a slight modification the machine could be used for planing. It was, therefore, equipped with a new head and has been used to advantage in connection with the recently devised process of making fishplates from scrap rail described on page 448 of this issue.

To adapt the old machine to this new service the circular saw was replaced with a 3-ft. circular head or wheel weighing about 300 lb., around the rim of which thirty cutting tools had been set. These tools, similar to those used on a planer, are set horizontally in holes drilled through the rim of the wheel and project from the wheel on the side away from the driving mechanism. Each cutter is held in place by two set screws, tapped in from the periphery of the wheel.

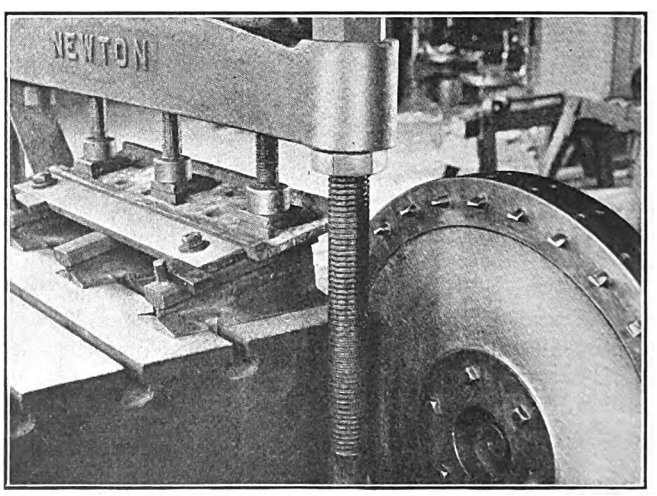
The driving mechanism and the feed are the same as used on the original machine with the exception of the drive pulley, which was changed so as to give a cutting tool speed of 45 ft. per minute. This is the linear speed of the cutting edges, which rotate on a circle 30 in. in diameter, and is the rate found most effective.

The bed plate or table on which the work is fastened is fixed, except for a slight lateral movement, to facilitate adjustment of the work in exact position. The mechanical feeding of the machine into the work is effected by an adjustable friction drive on the driving mechanism and can be varied between the limits of $\frac{1}{16}$ and $\frac{1}{4}$ in. per revolution. The machine is adapted only to cutting plane surfaces. Where beads or fillets are required the work is done on the ordinary planer.

The utilization of the old machine in this way was worked out by William Hendry, superintendent special-work shop, Market Street Railway.



GENERAL VIEW OF ROTARY PLANER, JOINT PLATE ON BED



CLOSE VIEW OF CUTTING HEAD, JOINT PLATE AT LEFT

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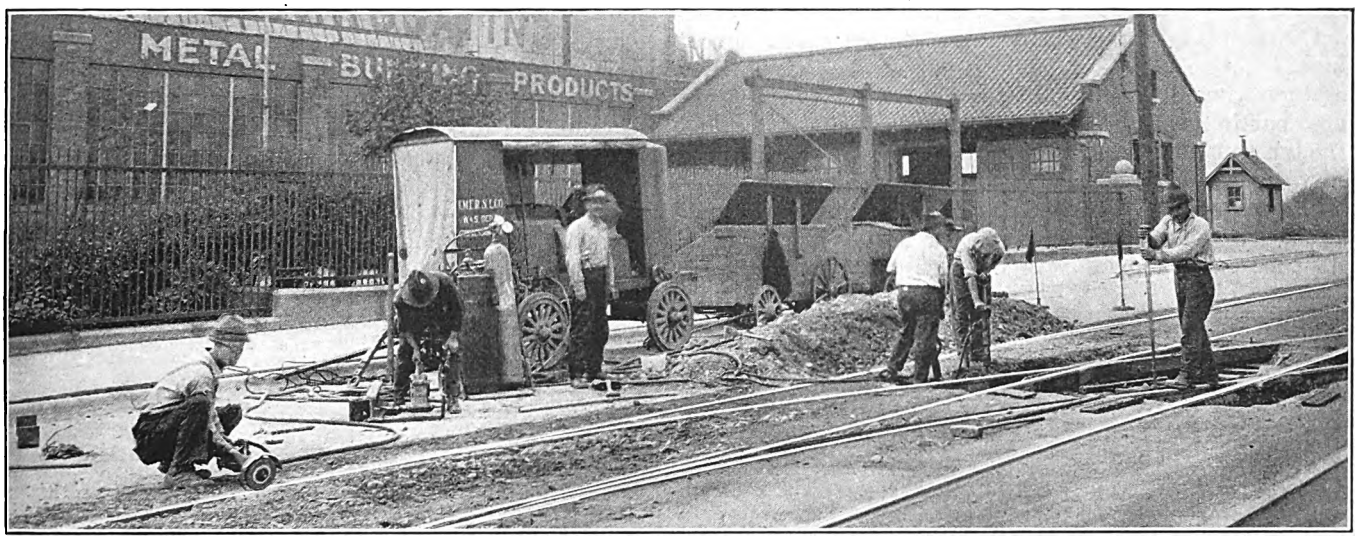
Specialized Repair Forces Produce Better Track Maintenance

Milwaukee Company Way and Structures Department Has Some Employees Organized Into Gangs Assigned Steadily to Certain Kinds of Work—The Men Become Expert in Their Specialties—Some Maintenance Practices and Equipment Used Are Discussed



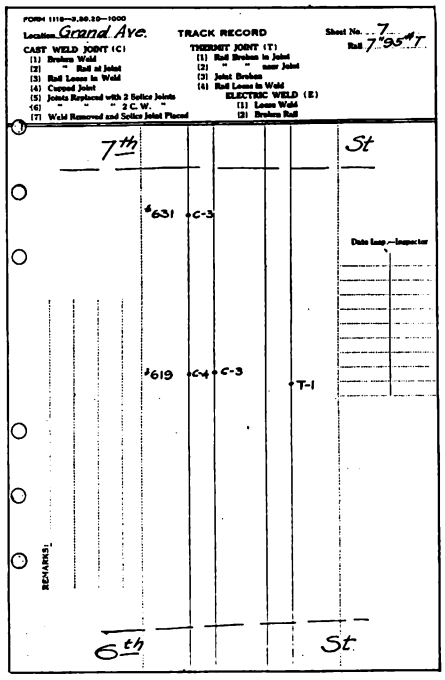
WELDERS BUILDING UP TRACK JOINTS, USING 100-AMP. WELDING MACHINE MOUNTED ON RUBBER-TIRED TRAILER

ROADMASTERS of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., are relieved of much specialized repair work incident to the general track maintenance, for the tendency of the way and structures department has been to separate those jobs requiring special experience and tools from the general run of trackwork. Under the ordinary plan it is necessary for the roadmaster and many of his men to be somewhat Jacks of all trades, but by segregating such work as special trackwork repair, grinding, welding and bonding, etc., from the duties of the roadmaster, and assigning these to men who do nothing else, the plan tends to produce better efficiency in all of the work.

Following out this general plan, the company has maintained during the past year, a special trackwork unit, a grinding, electric welding and bonding unit, cast and thermit welding unit, and an equipment maintenance group in addition to the general trackwork forces and the construction forces. Two or three general construction foremen take full charge of all major construction jobs and leave the roadmaster and his forces and the specialized units free all the year around to do the maintenance work.

The special trackwork repair unit consists of a foreman and five or more men who are equipped with an air compressor, various air tools including a hand grinder and air tampers, a full equipment of electric spike hole borers, spike drivers and track drills, acetylene cutting outfit, a dynamotor electric welder, special wrenches, and other tools incident to making special work repairs. The men in this unit are trained for the particular line of work and they operate independently of the general maintenance organization. Working continually at this one line of work, these men become very expert at fixing up worn special work to secure the maximum life before replacement. They also naturally handle this work more expeditiously than men who handle such work only now and then. Furthermore, it would be obviously impractical to provide the general maintenance gangs with as complete an outfit of tools and equipment.

Another maintenance unit working independently of the roadmaster's forces is engaged throughout the year on the grinding, electric welding and bonding work. This unit is made up of twenty-two men, who have been picked for their competency in doing any of the work involved in grinding, electric welding and bonding, as these different operations go together much of the time. This unit has six grinders at its disposal, including an Atlas grinder, a Goldschmidt thermit grinder, a reciprocating grinder and a Universal grinder. In construction and reconstruction work, the joints are frequently rough ground with the rotary type grinders and finished with the reciprocating type. Very little corrugation grinding has been found necessary in Milwaukee. The amount of grinding which is regularly handled by this repair



FORM USED BY FIELD MEN IN REPORTING BROKEN JOINTS
(Actual size 5⅛x8)

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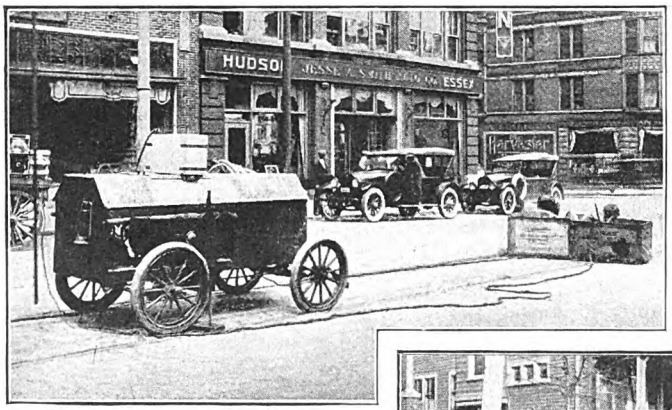
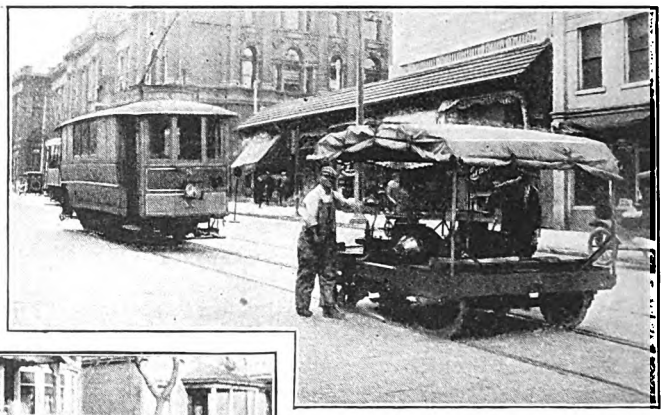
unit is indicated by the following record for a typical month's work.

	August
Joints ground	1,928
Frogs ground	42
Throatways	22
Mates	36
Switches	9
Total on special work	2,037
Corrugation	69 ft.

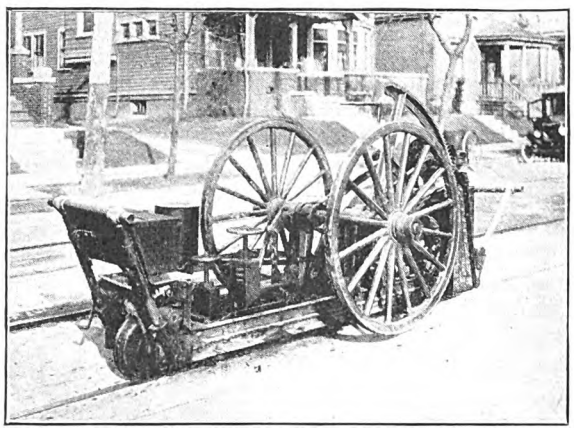
Of the total of twenty-two men in this maintenance unit, eight to twelve men are used for the major part of their time on the grinding work and for this reason are partly considered as a separate grinding unit, though some of these men are transferred when necessary to the welding and bonding work and they are therefore included in the total unit comprising the twenty-two men. There is another unit which divides its time in a general way between cast welding and thermit welding work, the size of the unit being increased by hiring additional laborers when cast welding is to be done. The Milwaukee Company is one of the few companies which have had good success with the cast-weld joint, some of these joints being twenty-three years old and still in perfect condition. Having had such good success with this type of weld the company will continue to use it in new work until convinced there is something better. The cast-welding equipment is also used to a considerable extent in maintenance work throughout the year.



MOTOR-GENERATOR WELDING OUTFIT MOUNTED FOR ROAD WORK



ROTARY GRINDERS USED TO REMOVE ROUGH SURFACE AFTER WELDING



RECIPROCATING GRINDER USED TO FINISH OFF THE RAIL AFTER WELDING

The thermit type of weld is used for compromise joints, special trackwork joints and under other special conditions. The electric process of welding joints has been used quite extensively, particularly during the last two years, in repairing defective joints. Altogether, the company now has some 55,000 welded joints of all types in service, and as the age of these joints varies from one to twenty-three years there is an annual requirement of about 2,500 welded joints to be repaired.

In the electric welding work the company makes use of two type W, 400-amp. welding machines supplied by the Rail Welding & Bonding Company, for welding joints and building up cupped rail; two type-B, 200-amp. Rail Welding & Bonding Company machines for bonding work, and one 200-amp. General Electric Company welding machine for top welding or building up work. Another G. E. machine has been ordered. It is impossible to draw an arc over $\frac{3}{16}$ in. long with any of these machines. No resistance-type welders are used.

The experience in Milwaukee is that it takes considerable time to break in a man as a welder. His experience and skill are reflected in subsequent maintenance results, that is, in better work rather than in a greater quantity of work. This is therefore also one of the considerations which have led to the advisability of having certain men specialize on this class of work all year around.

In building up cupped joints, the Milwaukee company has been getting excellent results through the use of a welding rod which gives a finished weld somewhat harder than the rail. The welded metal has no tendency to chip out, and being harder than the rail it does not pound out. These rods are purchased in 36-in. lengths and $\frac{3}{16}$-in. and $\frac{1}{8}$-in. diameters, and have this composition: Si, 0.15 maximum; S, 0.04 maximum; P, 0.03 maximum; Mn, 0.30 to 0.60; C, 0.85 to 1.10.

A complete inspection of the entire system is made during each year, covering all joint failures. The field men are provided with a convenient form on which to record the location and nature of these failures, the form being so arranged that the information is recorded with very simple notations. A separate sheet is made for each block of each line. A typical report as sent in by a field man is reproduced herewith. The information printed at the top of the form gives data which are very effective in simplifying the record work of the field man and the location of failure is roughly indicated by placing a dot on the form at a position corresponding to the location of the joint in the block and on the particular rail.

The data thus obtained by the field men are transferred in the main office to a map of the city system drawn on a scale of 1,200 ft. to 1 in., so that one can tell at a glance at the map just where the bad spots in the track system are. This, of course, usually means the old track locations. The different types of defective welded joints are shown in different colors.

With this information on the map to go by, a nightly

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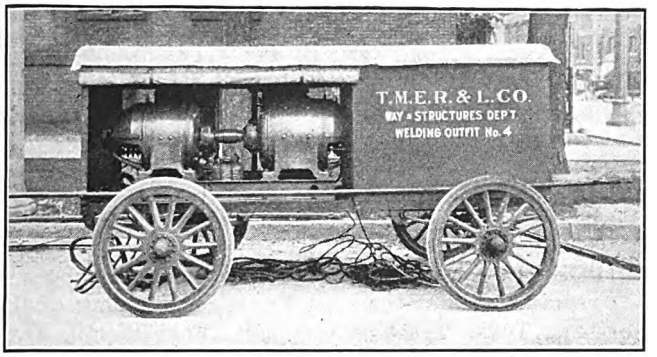


SPECIAL TRACKWORK MAINTENANCE UNIT AND EQUIPMENT

SUPPLY FORD HAULS MATERIALS AND WELDING OUTFITS

program of repair work is readily laid out in groups of 30 to 40 joints so that the work of the repair force can be expeditiously accomplished without involving too great moving distances between points. The welders, cupola, thermit and electric, are preceded by a special gang, which removes the pavement around the defective joints, and closes the pavement after the joints have been repaired. This repair unit is equipped with air compressors, concrete cutters, tie tampers, and equipment and materials for mixing concrete and grout to fill up the pavement openings.

Each of the general track maintenance gangs is equipped with an oxyacetylene torch for cutting rail and one for use in bonding. Where these men make emergency repairs to a joint that is somewhat pounded down, or to a broken rail, they take out a piece of the rail by sawing down through the head and then cutting the rest of the way through the web and base with the torch, angling the cut back somewhat so that the head of the rail and the insert piece can be brought together with smooth surfaces in contact, perhaps using shims. When such a repair is made a bond is placed around the joint with the acetylene torch to carry the return current temporarily until this joint is permanently repaired.

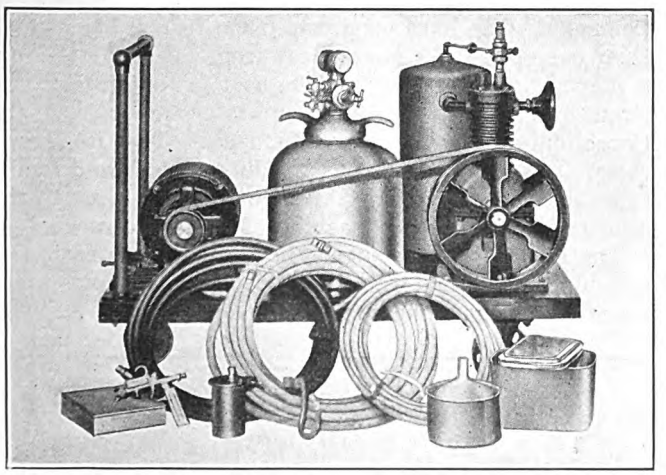
A third unit which specializes in certain work is under the direction of a supervisor of equipment. He has charge of all the power driven equipment of the way department, both as to maintenance and operation, except where a piece of equipment may be permanently assigned to a certain gang. Generally speaking, when any piece of equipment is needed, application is made to the supervisor of equipment, who supplies the machine required and an operator with it. He is also responsible for all maintenance work on all equipment wherever it may be in use and his men are picked for their special ability along this line. The extent of the equipment used by the Milwaukee company is very great, for money has been made available for the purchase of any machine that could show results in labor savings.

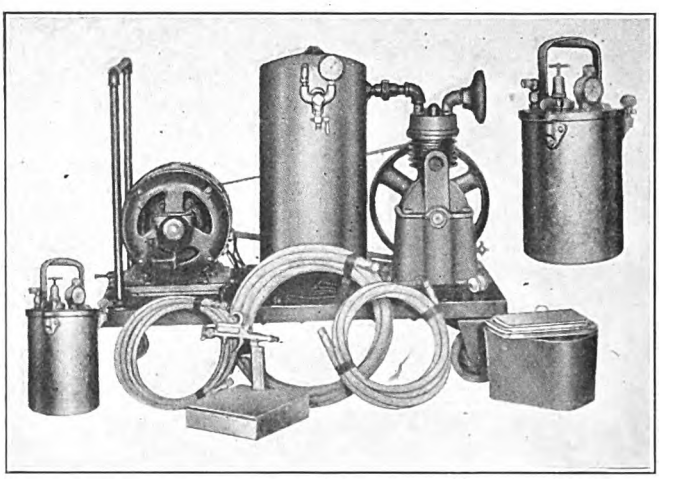
In all the interurban track and tie renewals, untreated Northern white cedar ties with tie plates are used. These are found to be the cheapest in annual cost, considering length of life and first cost when plates are used, for the failure of cedar ties is principally mechanical, due to rail cutting before deterioration takes place. Many of the cedar ties now in use have been in service for twenty years and are still good. Long leaf yellow pine ties are used in paved streets and white oak ties for special work.

New Portable Spray-Painting Equipment

THE accompanying illustrations show two types of hand motor-driven spray-painting outfits intended for one-man operation. These are the products of the DeVilbiss Manufacturing Company, Toledo, Ohio, and are designed for maintenance work in shops which are provided with electric current. These outfits can be handled by a single operator. The smaller outfit, designated as TP-601, is furnished complete with a ½-hp. motor, compressor and air reservoir mounted on a portable platform truck. The complete equipment also includes a 1-gal. pressure paint tank and necessary hose.

The larger outfit, designated as type TJ-601, has sufficient capacity to give a working radius of 100 ft. from the compressor to the paint tank and 25 ft. from the paint tank to the operator. A 7-gal. paint tank is furnished, together with extra lengths of fluid hose and repair parts.





SMALL HAND TRUCK SPRAY-PAINTING OUTFITS FOR ONE OPERATOR

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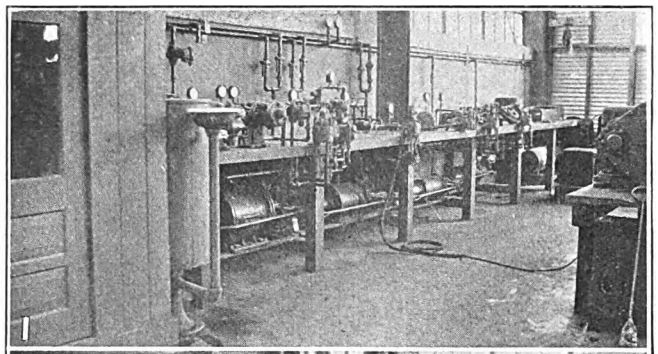

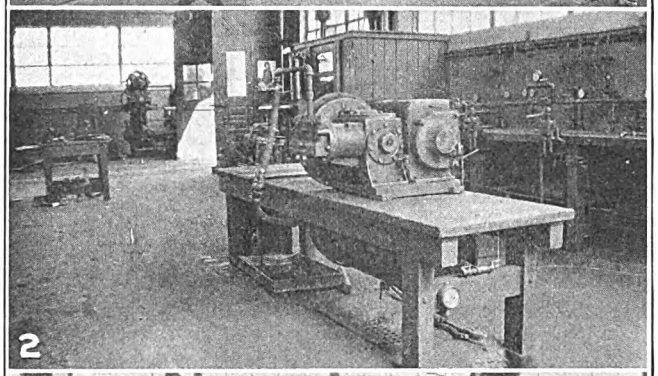

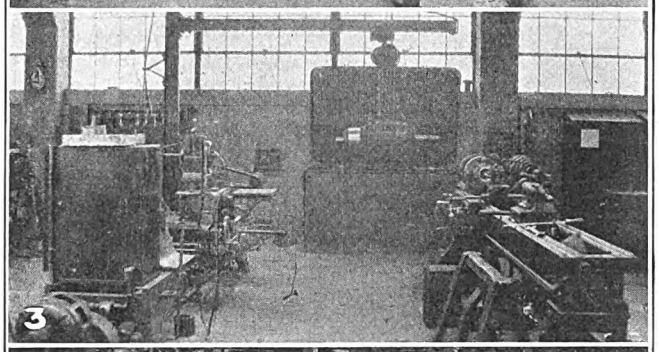

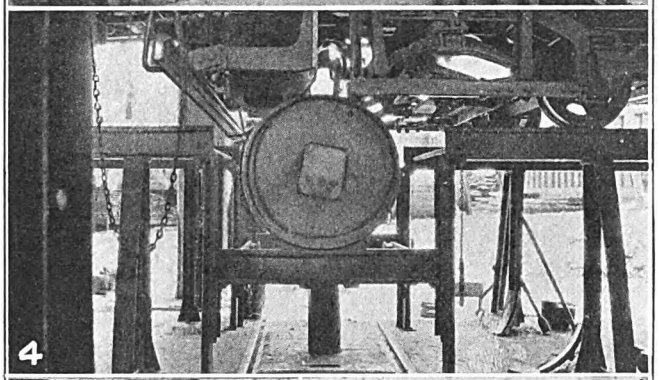

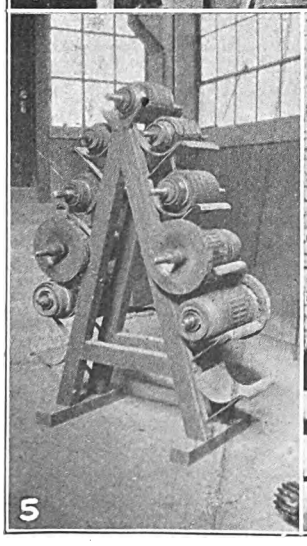

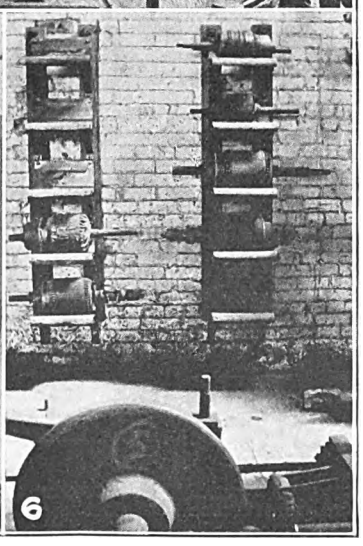

A few Labor-Saving Methods from Fort Worth

The East Front Street Shops of the Northern Texas Traction Company Are Laid Out to Give Efficient Routing of Work and Easy Handling of Equipment

BY J. T. PORTER
Master Mechanic Northern Texas Traction Company, Fort Worth, Tex.

UPON the completion of the new machine shop and repair tracks at the East Front Street shops of the Northern Texas Traction Company, Fort Worth, Tex., several labor-saving and time-saving devices were installed which have been of great assistance in keeping down maintenance costs.

An accompanying illustration gives a complete view of the air-test bench. We have two air mains leading to this bench from the main air reservoirs in the shop. Main No. 1 has 90 lb. pressure, and main No. 2 has reservoir or 120 lb. pressure. By means of necessary valves, gages, cylinders, etc., we are able to test all air equipment, for city and interurban cars, including air governors, triple valves, engineers' valves, double check valves, feed valves, pilot valves, emergency valves, door engines and brake cylinders.

OVERHAULING AND TESTING COMPRESSORS

Another illustration shows a close-up view of our air compressor work bench. This bench is 9 ft. long, 2¼ ft. wide, and 2¼ ft. high. Suspended underneath the bench is a 16-in. x 36-in. air reservoir. Also shown in the illustration is the air gage connected to the air reservoir and the two pet cocks. One has a $\frac{3}{32}$-in. orifice, the other has a $\frac{9}{64}$-in. orifice. After a compressor has been repaired it is hooked up to the reservoir under the bench by means of the standard ¾-in. hose and coupling, and the compressor is tested to see whether it will pump to its required pressure within its allotted time. After the required pressure has been reached in the reservoir, one of the pet cocks is opened (depending on the capacity of the compressor) and the compressor if in good condition will keep the pressure up to 75 lb. in the reservoir while the air escapes through the pet cock. Sixteen-foot compressors are tested with the $\frac{3}{32}$-in. orifice open, and the 25-ft. compressors are tested with the $\frac{9}{64}$-in. orifice open.

The bake oven in use by the armature department for baking armatures is another important adjunct. The heat is controlled by a 210-deg. Fahrenheit thermostatic control system as made by the Consolidated Car Heating Company. The bake oven was made in our blacksmith shop out of No. 10 gage sheet iron. It is 6 ft. long, 4 ft. wide, and 3 ft. high. The heat is supplied by two circuits of 600-volt standard car heaters as made by the Consolidated Car Heating Company. The jib crane shown in the illustration has a radius of 10 ft. and facilitates the putting in and taking out of armatures to the oven from the banding machine or armature racks.

The armature rack shown in another illustration is self-supporting and can be placed in any convenient space about the armature department; it is a cupped-

Testing and Overhauling Equipment

No. 1—Test bench for air brake parts.
No. 2—Air compressor repair and test bench.
No. 3—A conveniently located jib crane serves the baking oven.
No. 4—Removing car wheels with a pit jack.
No. 5—Self-supporting armature rack.
No. 6—Armature rack mounted on wall.

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shelf construction and will hold all types of small armatures, thus eliminating the many special racks for the various types of armatures. Armature racks of the same construction are mounted on the wall to take care of defective and other armatures that are seldom used.

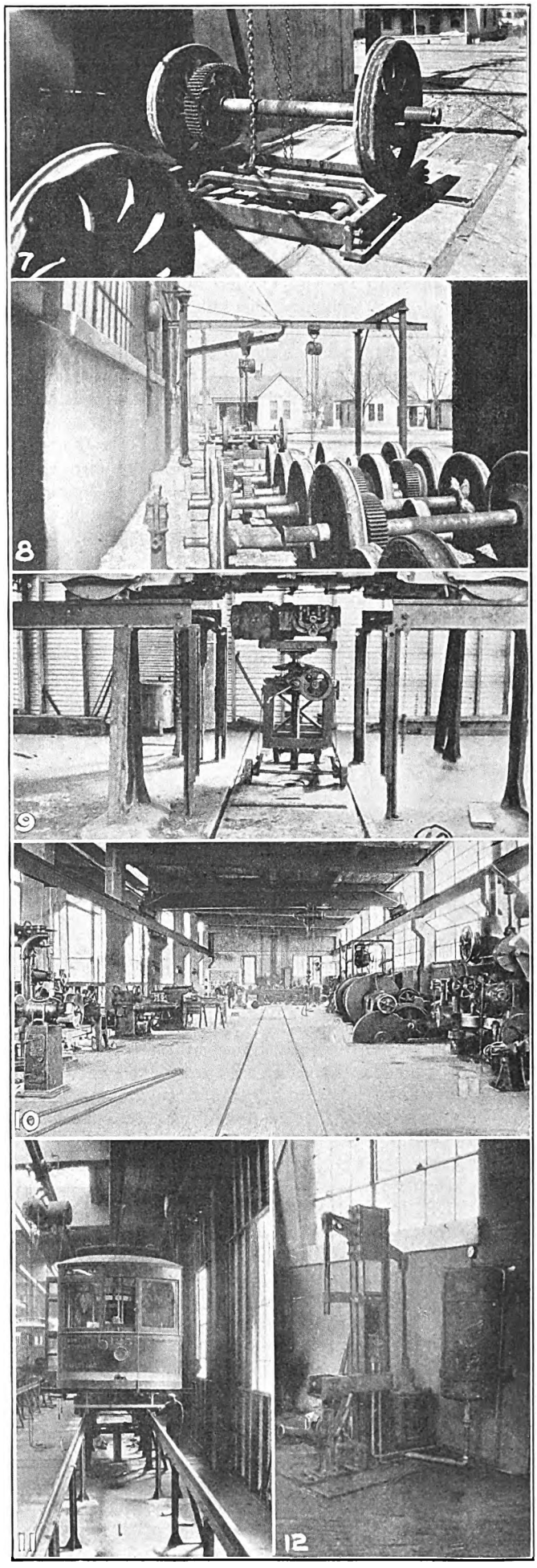
The wheel jack which we have is a great labor saver as well as a time-saving device. By means of the overhead cranes the car body and truck weight is taken from the wheels and the wheels are then dropped out of the truck and rolled on the wheel-changing carriage to the wheel-storage track as shown. At the wheel-storage track a new pair of wheels is placed on the carriage and rolled into place under the car. The carriage is raised and lowered with an 8-in. hydraulic ram. A tank of sufficient capacity is located in a small pit filled with oil which is used to displace the ram. The ram is operated with a brake valve, the air line having a constant pressure of 80 lb. The wheel-storage track is constructed with two standard-gage tracks staggered on the same ties, thus giving nearly double the storage capacity of wheels on the one track space. The cranes for picking up the wheels and the wheel jack carriage, running on its own narrow-gage track, are great labor savers.

Our method of changing air compressors is very efficient. The car is placed so that the air compressor is directly over the wheel-jack carriage. The wheel-jack carriage is then moved out of the way, giving a clear space to work in. A hand jack made by the Electric Service Supplies Company is then used to remove and replace the compressors. This system of changing compressors saves much time and also saves hard labor on the part of the men.

Air Press for Removing Armature Bearings

An air press made in the shop and used principally for pressing armature bearings in and out of box frame motors is another handy piece of equipment. The lever arm has holes spaced at different distances from the fulcrum, thus permitting different pressures to be applied by changing the arm in the working side of the lever to the hole desired. With 110-lb. air pressure on the 12-in. air cylinder pressures up to 30 tons can be applied.

The arrangement of the machines as shown in the general view of the machine shop was made after a careful study relative to the effectiveness of a good layout. On the right-hand side of the picture are shown the wheel press, boring mill, wheel lathe, 42-in. lathe and 26-in. lathe. On the left-hand side are shown the tool grinder, power saw, drill press, pipe threading machine, bolt machine and shaper. At the rear is shown the armature department, containing bake oven, banding lathe and work bench. Traveling the full length of the shop is a 5-ton electric crane. Throughout the length of the shop is a 36-in. track connected to two branch lines at right angles by turntables. These two branch lines lead directly to the two wheel-changing jacks. The wheel-jack carriage runs on this narrow-gage track, thus facilitating the disposal of old wheels by leaving them at the wheel lathe, wheel press, etc.



Handling Wheels and Compressors

No. 7—Wheels are placed on a wheel-changing carriage.
No. 8—Wheel storage track with convenient crane and hoist.
No. 9—Pit jack carriage used for removing compressors.
No. 10—General view of machine shop.
No. 11—Overhead traveling cranes raise the car body.
No. 12—Press for installing and removing armature bearings.

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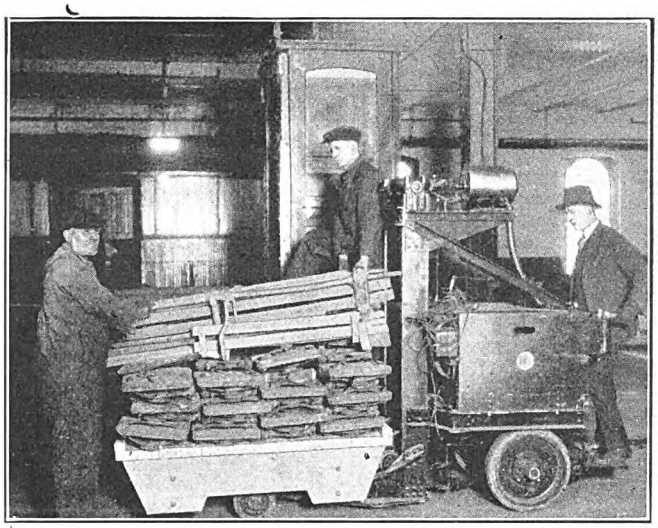
Lift Truck Produces Substantial Savings in Railway Shop

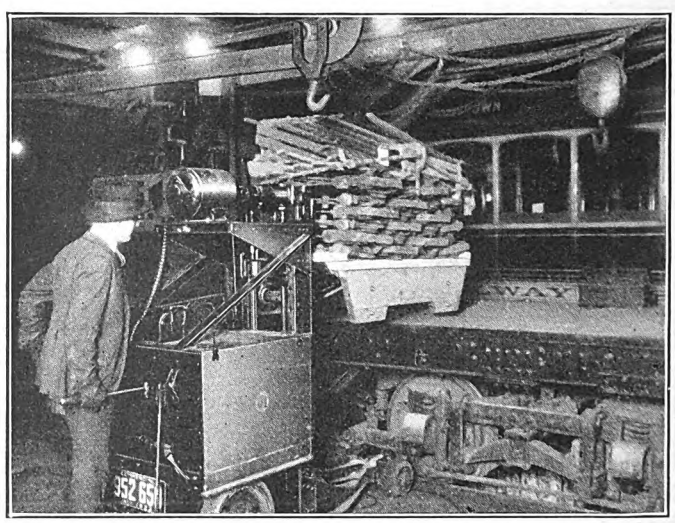
Third Avenue Railway, New York City, Is Finding Many Opportunities for Handling Maintenance Material by a Tier-Lift Truck Operated by One Man

THE problem of economical and speedy handling of all classes of railway shop materials is being effectively solved by the use of a lift truck in the shop of the Third Avenue Railway, New York, N.Y. This truck has been in use only a very short time, but the multitude of uses indicates the immense value and the substantial saving that can be brought about by lessening handling costs, increasing storage space and speeding up the transference and handling of material.

Before the introduction of this truck materials were transported about the shop through the usual type of hand-drawn trucks found in most electric railway shops. The various machine tools were served by either jib cranes or traveling cranes, and where it was necessary to transport the material by means of a supply car, this was loaded by hand with the various small parts which could be conveniently lifted by one or two men, a crane on the car handling the larger parts. Some of the revised methods inaugurated since this truck was received are shown in the accompanying illustrations.



A LOAD OF MAINTENANCE MATERIAL READY FOR LIFTING TO THE SUPPLY CAR



DEPOSITING A SKID LOADED WITH CONTACT PLOWS AND FENDERS ON A CRANE CAR

The particular truck in use is the Lakewood Engineering Company's tier-lift truck, model 703. This truck has a load capacity of 4,000 lb., which may be lifted at a rate of 1 ft. in eighteen seconds to any height between 11 in. from the floor up to 60 in. Where it is particularly desirable to save time, the load can be lifted while the truck is being operated to transport the load. The truck has an over-all height of 79½ in. and an over-all length of 121½ in. with the steering handle in operating position and 109 in. with the step and steering handle folded. The over-all width is 36 in. The platform consists of a steel checkered plate with a length of 54 in. and width of 26 in. The platform height in the lowered position is 11 in. from the floor. The drive is two-wheel, with worm and gear, with a wheelbase of 62 in., wheel tread at the operating end of 27 in. and wheel tread at the load end of 19½ in. This truck has a turning radius at the extreme outside corner of 92 in., at the extreme inside corner of 42 in. and for the outer wheels, 78 in. The wheels are fitted with solid rubber tires, the operating end being 20 in. x 3½ in. and the platform end 10 in. x 4 in. The weight of the truck without batteries is 2,400 lb. The motor for main drive is 24 volts, 65 amp., series wound, entirely inclosed and dustproof. The lifting motor, which is an independent unit, is 24 volts, 40 amp., with ample overload capacity for short periods.

The battery used is the General Lead Battery Company's standard industrial truck type. It has twelve cells of seventeen plates each of the "H" (heavy) type, the positive plates being $\frac{14}{64}$ in. thick. The battery has a capacity of 252 amp.-hr., at the four-and-one-half-hour rate of discharge equivalent to 6 kw.-hr. Special compound non-breakable jars, $\frac{5}{32}$ in. thick, are used. The trays are hard maple, slow-heat paraffined and then treated with acid-resisting asphaltum paint. Bolted connectors are used for cells and the Westinghouse patented joints for tray connections. The battery complete weighs 685 lb.

To operate the truck, the operator stands on a low step. The controller is conveniently located at his left hand when he faces the platform and the steering lever is on his right. Three speeds forward and three reverse speeds are provided. A small controller located immediately in front of the operator with one speed in either direction controls the up and down operation of the load platform. This control includes dynamic brake contacts to stop the load platform instantaneously in any desired position. This controller is automatically returned to neutral position when the load platform reaches its maximum tiering height or its extreme down position.

The brake action and a safety switch are controlled by a foot pedal on the platform. This arrangement is such that the brakes are fully released and the switch closed when the pedal is pushed down flush with the

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floor. When the operator steps from the truck or removes his foot from the pedal the safety switch in the controller automatically breaks the current. At the same time the brakes are automatically set. It is thus practically impossible to operate the truck except in the normal operating position.

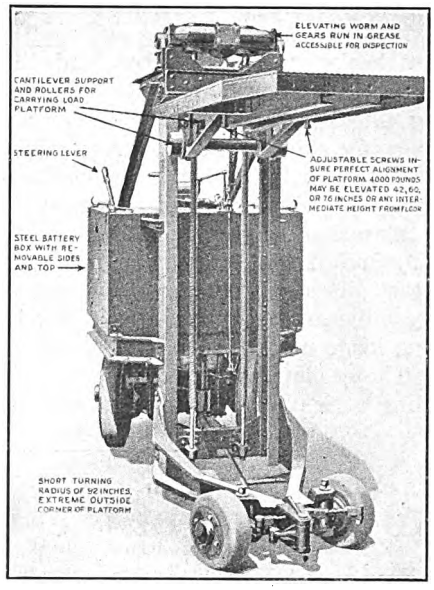
Load Platform Has Cantilever Support

The stresses set up by the load on the platform are carried by a cantilever type support and are distributed through heavy steel rollers, each mounted on two high grade annular ball bearings. The load on the platform is balanced over the load carrying wheels, which eliminates the tendency for the truck to tip when the load is raised.

There are two adjusting screws under the platform to insure perfect alignment of the platform should the rollers wear slightly after long usage. The load platform is lifted by two forged steel phosphor bronze bushed trunnion nuts. These trunnion nuts operate on two vertical steel screws.

The housing in which the two worm gears at the top of the column are mounted is supported on a trunnion. Hence it may oscillate to obviate any possibility of binding on the vertical screws due to the twisting of the frame or slight wear in the cantilever support rollers. This housing is packed in grease. The frame for supporting the column and the axles is made of cast steel. The load platform of corrugated steel is hinged at the column end so that if it should strike an obstruction when the load is being lowered it would simply raise the platform and not strain the supporting mechanism. The battery box is made of sheet steel with sides and top removable, so that the batteries are accessible for inspection and maintenance repairs.

The combination of an elevating platform with a load-carrying truck assists materially in lessening handling costs, as much of the material handled in any electric railway maintenance shop must ultimately be raised to machines or benches or lowered to the shop floors. With such a type of truck it is possible to run the platform underneath the compressor of a car, raise the platform so as to support the compressor while it is being loosened from its supports, then lower sufficiently to clear the car body and back out of the way. The compressor can then be transported to the overhauling shop and be placed on the compressor overhauling bench by one man. The reverse operation can also be carried out by one man when the compressor is ready for reinstallation. Ordinarily such an operation would require from two to six men, and the time consumed would be materially greater. Also many of the disagreeable features of the work are removed, as the truck does the lifting and transporting and the operator finds real enjoyment in propelling the various parts through the shop and in placing them in repair locations.

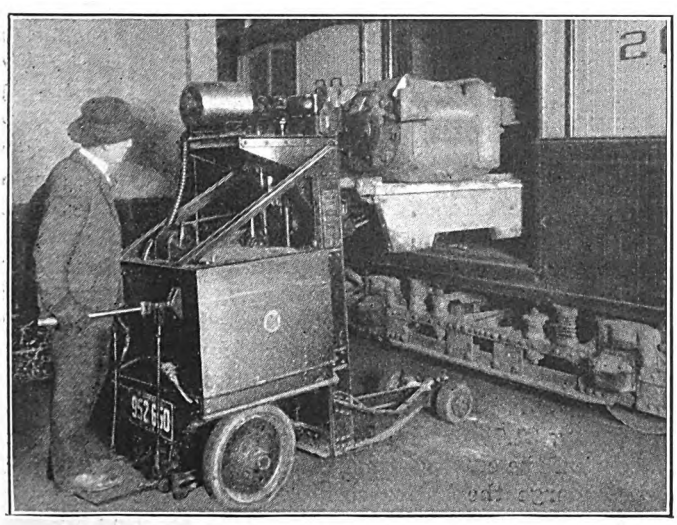


Lift Truck with Platform Raised

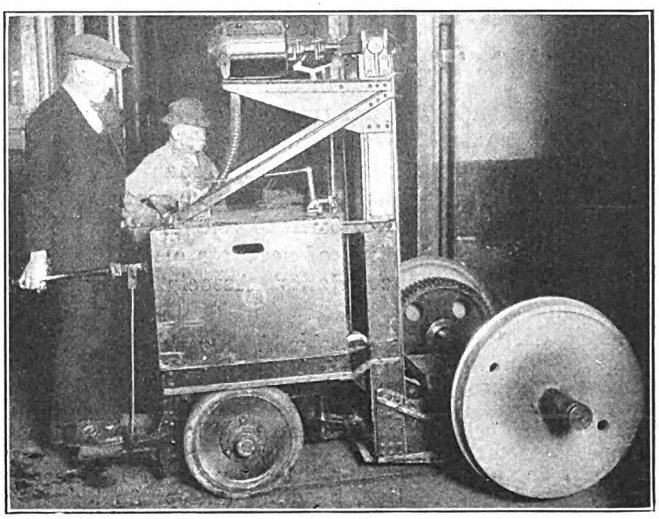
Wheels Can Be Picked Up and Placed in Wheel Lathes for Turning by One Man

The serving of the various electric railway shop tools by a lift truck is another economy being practiced by the Third Avenue Railway. An accompanying illustration shows the truck just as it has picked up a pair of wheels as they were removed from a car. The platform is low enough so that it can be run underneath the axles of the smallest pony wheels and the lift of the platform is sufficient to take care of the largest drivers. Without further work the operator can transport the wheels to the machine shop and place them in the wheel turning lathe for turning or in the wheel press for removal of the wheels. Most electric railway shops, however, are equipped with cranes for handling wheels into and out of these machines. In such cases the truck can deposit the wheels in a convenient location or, where space accommodations are limited, the storage capacity can be increased considerably by piling the wheels as desired.

Other work readily taken care of by this truck in-



Heavy Motors Are Readily Loaded Into Supply Cars by One Man



Wheels Can Be Picked Up from Cars and Readily Transported to Shop for Overhauling

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cludes the picking up, transporting and placing of motor shells in lathes for reboring, the placing of shafts, armatures and other heavy parts in lathes and the handling of heavy castings which require drilling. Two of the accompanying illustrations show the lift truck in the operation of placing skids of maintenance material in position on supply cars. The Third Avenue Railway uses several types of supply cars for transporting various maintenance materials to the shops and points where they are used. One of the illustrations shows a skid loaded with contact plows and fenders being loaded on a large crane car, while another shows the truck in the act of depositing a large motor through the door of another supply car. The economies resulting from this rapid and easy handling of material by one man will be readily appreciated by those engaged in such work. For convenience in handling various classes of small material, it is desirable to use platform body skids, platform boxes, dump skids and roller platform skids. To meet these conditions the Lakewood Engineering Company has developed a very complete line. Material can be kept in the storeroom racks on platforms and can be taken out as each set of parts is required. Where space is at a premium, the various types of skids can be piled one on top of the other and can be so arranged that these can be removed without disturbing the loads in other parts of the pile. In storerooms which are provided with such a truck, properly designed racks will effect material economies in storage and also give facilities for depositing and removing loads.

Two Aspects of the Tie-Treatment Question

"Shall Tie Treatment Be Charged to Maintenance?" Is First Considered, After Which the Author Gives Statistics as to the Subject in General and Shows When Tie Treatment Pays

BY HOWARD H. GEORGE
Engineer of Maintenance of Way, Public Service Railway, Newark, N. J.

IN THE ISSUE of the *Railway Age* for Feb. 18, 1922, page 416, there appears an article by Earl Stimson, chief engineer of maintenance, Baltimore & Ohio Railroad, entitled "Should the Cost of Treating Ties Be Charged to Maintenance?" The basis of the reasoning in Mr. Stimson's article was this question: Should the treatment of a wooden tie with preservatives be considered in the same category as the case of a wooden tie being replaced by a steel or other substitute tie, thus entitling the cost of the treatment to be capitalized? His conclusion, from the viewpoint of the maintenance engineer rather than that of the accountant, was that the practice on his property of charging the cost of treating ties to maintenance is justified.

A section of the I. C. C. classification of accounts for steam roads was quoted to show that the intent of the classification, as far as ties is concerned, is to permit of capitalizing only the excess cost of metal ties over wood ties, and does not make any mention of excess cost of treated over untreated wood ties. Mr. Stimson's contention, however, that it is plainly evident that the commission did not intend to consider treatment as a "betterment" is not borne out by the facts. Athough it is true, as he stated, that in the above classification no specific mention is made of treated ties, it is equally true that in the commission's definition of the term "betterment" no specific mention is made of many other items which are properly considered as betterment. The corresponding account (No. 6, Road and Equipment) in the standard classification of accounts of the American Electric Railway Accountants' Association reads as follows:

> 6—Ties—To this account should be charged the cost of cross, switch, bridge and other ties and railway crossing timbers laid in main and repair tracks, sidings, and spurs; in tunnels, station, shop and other yards; on wharves, piers, track scales, inclines, bridges, trestles, culverts, in carhouses, shops and storehouses, and on transfer tables and turntables. To this account should be charged also the cost of transportation, inspection, handling (except final distribution) *and any process of preservation.*

Mr. Stimson took the position that if the earnings are large, it is desirable to put a portion back into the property. It is gratifying to know of a railroad property whose earnings today are large enough to be able to pay for betterments of this character, but such a state of affairs exists on but few electric railway properties. On the other hand, many of the latter who, a few years ago, were using treated ties almost exclusively have been obliged as a temporary expedient either partly or entirely to discontinue the use of treated ties because of the demand for immediate economy in order to tide over the present emergency.

TIE RENEWAL ON STEAM AND ELECTRIC ROADS COMPARED

There is no question that, from the viewpoint of the average steam road maintenance engineer, whose main problem is either extensive tie or rail renewal (but seldom both at the same time in the same track), the logical place to charge the treating cost is to maintenance. Certainly it is true that casual renewals of a few ties here and there on electric railway properties are and properly should be charged to this account. It is not practicable to split charges for such renewals between operation and construction. In the case of major renewals, however, where the entire structure is being rebuilt or entirely replaced, and the estimated or actual cost of the old track is written off, it would seem to be decidedly unfair to charge to operating expenses the increase in cost of a treated tie due to the treatment itself.

Suppose that we consider from the electric railway standpoint the case of a track being entirely replaced. The original track was constructed with untreated wooden ties which cost and were capitalized at, let us say, 80 cents each when the track was built, while the new track is being constructed with creosoted ties costing, say, $1.75 each. It is customary in such cases to write off the entire estimated original cost of such track and charge the entire cost of such new track to the capital account. If this is done, the addition to fixed capital will certainly include the difference between the

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cost of the old ties and the cost of the new ties, and a part of this difference is the cost of treatment.

In the same way, if an untreated red oak or short-leaf pine tie had been replaced by a good white oak tie, which always costs more than the first-mentioned ties, the excess cost would also have been included in the amount chargeable to new capital. Similarly, if a piece of new track with treated ties were being built as an extension, whether by a steam road or by an electric road, the cost of treatment would certainly be capitalized along with the other costs. Added value undoubtedly accrues to the track, increased life of the substructure surely results. There is also a proportionate decrease in the annual maintenance charges for tie renewals, and, what is even more important in the case of street railways, in the cost of replacing the concrete base where ties have to be replaced. The substitution of a tie which will last at least twenty years in a track for an untreated tie having a life of only ten or twelve years should certainly be considered a betterment. An excellent example to prove the value of creosoting ties is the case of track laid in Denver in July, 1898, and reconstructed during the summer of 1920, a description of which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 22, 1921, page 187. After twenty-two years of continuous service, these ties, which were of hemlock, were found to be in an excellent state of preservation.

MECHANICAL WEAR RATHER THAN DECAY INTERESTS THE STEAM RAILROAD ENGINEER

It is to be expected that the viewpoint, on this subject, of the steam railroad engineer, whose general experience is that the most frequent cause for tie renewal is not decay but rather mechanical wear, will differ materially from that of the street railway engineer, with his radically different conditions. Of course, treatment does not increase resistance to wear. Mr. Stimson stated that "in the case of a metal tie substituted for a wooden tie, there is unquestionably a substitution of a superior part for an inferior part, as the tie is made of a radically different and structurally superior material." Now the life of a tie in a street railway track is seldom determined by its mechanical strength, but rather by its ability to resist decay, and a properly treated wooden tie has fully demonstrated its ability to do this. It is a common occurrence to renew rail on creosoted ties without disturbing the ties, ballast or concrete paving foundation in the slightest degree. Hence if it is reasonable that the excess cost of steel over wood ties should be capitalized, the same is true of the cost of tie treatment.

In one paragraph of the article in question appears the following statement:

> The rapid rise in the price of timber has increased the price of the tie in much greater proportion than the cost of treatment has increased. Less expensive treatments that have been found adequate are being used more and more in place of the more expensive treatments formerly considered necessary. The result has been that the ratio of the cost of treatment to the price of the tie has decreased greatly, making the use of treatment not only show greater economies but also reducing the proportion that the excess cost of treatment bears to the total cost of the treated tie. This should in itself stimulate the use of treated ties and not make necessary resorting to the doubtful expedient of capitalizing.

The statement of facts in this paragraph cannot be controverted, although exception will probably be taken by many to the conclusions drawn as to the matter of doubtful expediency of capitalizing treatment of ties for all conditions which have to be considered. It is believed, however, that the thought contained in the above statement as to the economies to be effected by treating ties and timber should be emphasized and advantage taken of this opportunity again to bring to the attention of our industry the urgent need for a greatly increased use of wood preservation. The steam railroads for years have been treating large quantities of timber, especially ties, realizing the importance of conserving as much as possible the available supply, but electric railways have, as a general rule, not appreciated the value or need of treatment to the same degree, and have not adopted it to anywhere near the same extent as the steam roads.

WHAT IS OUR TIMBER SITUATION?

Leaving now the subject of charging tie treatment to one account or another, let us examine the timber situation as a whole so as to appreciate the necessity for more extended use of preservative treatment.

E. H. Clapp, then assistant forester, Forest Service, United State Department of Agriculture, in testifying before the Committee on Interstate and Foreign Commerce of the House of Representatives on July 19, 1919, regarding the shortage of railroad ties (see report on House Resolution No. 20, 66th Congress), stated that the maximum requirement of ties reached about 150,000,000 in 1907, falling to a little under 100,000,000 in 1915, and that the average for the preceding fifteen years had probably been in the neighborhood of 125,000,000 ties, representing a total of about 4,000,000,000 ft., board measure, these figures including both steam and electric lines. Lumber production for all purposes in the United States reached the total of 46,000,000,000 ft. b.m. in 1906 and 1907, dropping to 40,000,000,000 ft. b.m. in 1914 and to 32,000,000,000 ft. b.m. in 1918. Including other wood products, such as fuel wood, the total annual cut of timber in the United States probably reaches between 90,000,000,000 and 100,000,000,000 ft. b.m. It was estimated that in addition to the above, probably about 10,000,000,000 ft. b.m. should be added to cover losses by fire. The original forest area of the United States was estimated at about 850,000,000 acres, of which about 230,000,000 acres of mature timber was standing at that time, or not much more than 25 per cent. The total forest acreage at that time, including cut-over lands, was estimated at about 500,000,000 acres, of which about 100,000,000 was very largely waste and another 180,000,000 acres had some timber on it of comparatively inferior quality. Mr. Clapp stated that the annual growth was only about 35,000,000,000 ft. b.m. as against an annual consumption of between 100,000,000,000 and 110,000,000,000 ft. b.m. *Commerce Reports* for Feb. 6, 1922, states that a total of 3,149,788 railway ties were exported during 1921, of which almost half went to Canada.

Against the above total consumption of timber there was treated in 1909 (see report United States Department of Agriculture, Forest Service) only a little over 911,300,000 ft. b.m. of timber of all kinds, which included only about 20,700,000 ties, or about 745,000,000 ft. b.m. In 1913 the amount of timber treated for all purposes had increased to a total of a little less than 2,000,000,000 ft. b.m., which included about 43,850,000 ties, or about 1,580,000,000 ft. b.m., and in 1918 the amount of timber treated for all purposes had dropped to about 1,470,000,000 ft. b.m., which included about 30,600,000 ties, or about 1,102,000,000 ft. b.m. The total axerage amount of timber treated for the ten years preceding 1918 was only about 1,584,000,000 ft. b.m., which

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included only about 33,000,000 ties, or about 1,190,000,000 ft. b.m. Compare this with the total average consumption of, say, 125,000,000 ties per year and the result is only about 25 per cent. Or, if we compare the total lumber consumption per year of 110,000,000,000 ft. b.m. with the total amount of timber treated for all purposes of about 1,584,000,000 ft. b.m., the result is only about 1.40 per cent.

Electric Railways Are Behind in Tie Treating

The total mileage of electric railways in the United States is, roughly, 44,000. The writer has just had occasion to analyze the replies to a questionnaire on railroad ties sent out by the American Electric Railway Engineering Association, in order to secure data on present practice among member companies for the use of its representative on the sectional committee on standardization of railroad ties which has been formed under the direction of the American Engineering Standards Committee. The member companies number about 350 and represent a total of about 33,500 miles of trackage. At the time of the writing of this article 179 replies had been received from companies having a total of 26,006 miles. This covers more than 51 per cent of the total number of member companies and nearly 78 per cent of their total mileage, or about 60 per cent of the total electric railway mileage in the United States. Out of the 179 companies which replied only sixteen, representing 2,140 miles of track, reported using all treated ties. Forty-two companies, with 7,628 miles of track, reported using part treated ties, while 121 companies, with 15,238 miles of track, reported using no treated ties. The companies reporting were from practically every state in the Union and included every large property. The result of this canvass may therefore be taken to represent, with a reasonable degree of accuracy, the situation throughout the country. According to the above analysis only 8.9 per cent of the electric railway companies, representing 8.2 per cent of the total mileage, are using all treated ties, another 23.4 per cent of the companies, representing 29.3 per cent of the total mileage, are only partly using treated ties, while the remaining 67.7 per cent of the companies, representing 62.5 per cent of the total mileage, are using no treated ties whatever. These figures represent 1922 practice among our street railways.

Not every company is as fortunate as the Boston Elevated Railway, which, in 1916, installed its own pressure wood-preserving plant (see ELECTRIC RAILWAY JOURNAL, Nov. 18, 1916, page 1065), but many are located within reasonable distance of some commercial timber treating plant, and there is always left for consideration the open tank and dipping processes, which are better than none at all. And for other timber there are still available the brush or spray treatments, which have their merits. When all the facts are considered, it is quite probable that either the open tank, dipping, or brush treatments will be most practical from an economical standpoint. The question resolves itself into one of "How much can we afford to spend for treatment?"

Economic Features of Tie Treatment

E. F. Paddock has compiled a very complete set of tables showing the annual charge in per cent of the total original cost for various periods from one to twenty-five years, with interest at 5 per cent. From this table we find that the annual charge expressed in per cent of the original cost of an article whose total life is, say, five years figures out to be 23.0975 per cent. If its life is seven years this annual charge figures out 17.282 per cent of the original cost; if ten years, the annual charge is only 12.9505 per cent, and so on. To apply this to the case of a tie, assume an untreated tie which has decayed in five years to the point necessitating renewal, the tie having originally cost 65 cents delivered or, say, 85 cents each in the track. The annual charge at 5 per cent on 85 cents for five years is therefore 23.0975 per cent of 85 cents or 19.6 cents. Suppose it can be demonstrated that open-tank treatment would increase the life of such ties to ten years and that it cost 25 cents to treat the tie by such a method. The total cost of the treated tie would then be 85 cents plus 25 cents or $1.10, and the annual charge would be 12.9505 per cent of $1.10 or 14¼ cents, as compared with 19.6 cents for the untreated tie, a saving of 5⅜ cents per year per tie. If ties are laid on 2-ft. centers, this means 2,640 ties per mile, a saving of $140.80 per mile per year. On a property of, say, 100 miles this means $14,080 per year or the equivalent of a 4 per cent dividend on $352,000.

Or, to cover the case of a treatment which would add only two years life to such a tie, we can then afford to increase the initial cost of such a tie to 1.336 times the cost of the untreated timber. We can afford to spend 33.6 cents on every dollar's worth of such timber that will increase its life from five years to seven years, without increasing the annual charge. With lumber at $60 per thousand feet board measure this would amount to $20.16 per thousand feet for treatment. If the treatment increases the life from five to ten years, this figure is 78.35 cents on every dollar, or $47.01 per thousand feet board measure.

As was shown, we are producing only about one-third as much lumber as we are consuming each year, and the figures given should serve to emphasize the urgent need of conserving our timber supply as much as possible and to show the economies to be effected by the use of wood preservation and the effect a greater use of such preservation would have on such a program of conservation.

Electric Railways Earned 4.11 per Cent in 1919

OF THE 1,603 electric light and power companies making income tax returns for 1919, 454 had no net income whatever. Among 1,046 electric light and power companies it was found that the net income was 6.53 per cent of the invested capital. The figures have just been compiled by the Bureau of Internal Revenue. The total net income of 1,149 electric light and power companies was given as having been $49,515,624 in 1919. On this income tax to the extent of $4,639,440 was paid, in addition war profits and excess profits taxes were paid to the amount of $1,164,563. The deficit reported by the 454 companies which reported no net income was $4,360,909.

According to the bureau's figures, all transportation and other public utilities show their net income to have been 6.39 of the invested capital. For the steam railroads the figure was 4.78 per cent; for electric railroads, 4.11 per cent; for ocean lines, 23.46 per cent; for gas companies, 6.07 per cent; for telephone and telegraph companies, 7.01 per cent.

There were 242 electric railways which reported a net income of $29,387,511. Their total tax was $3,126,002. There were 196 electric railways which had no net income. Their deficit is shown as being $10,860,272.

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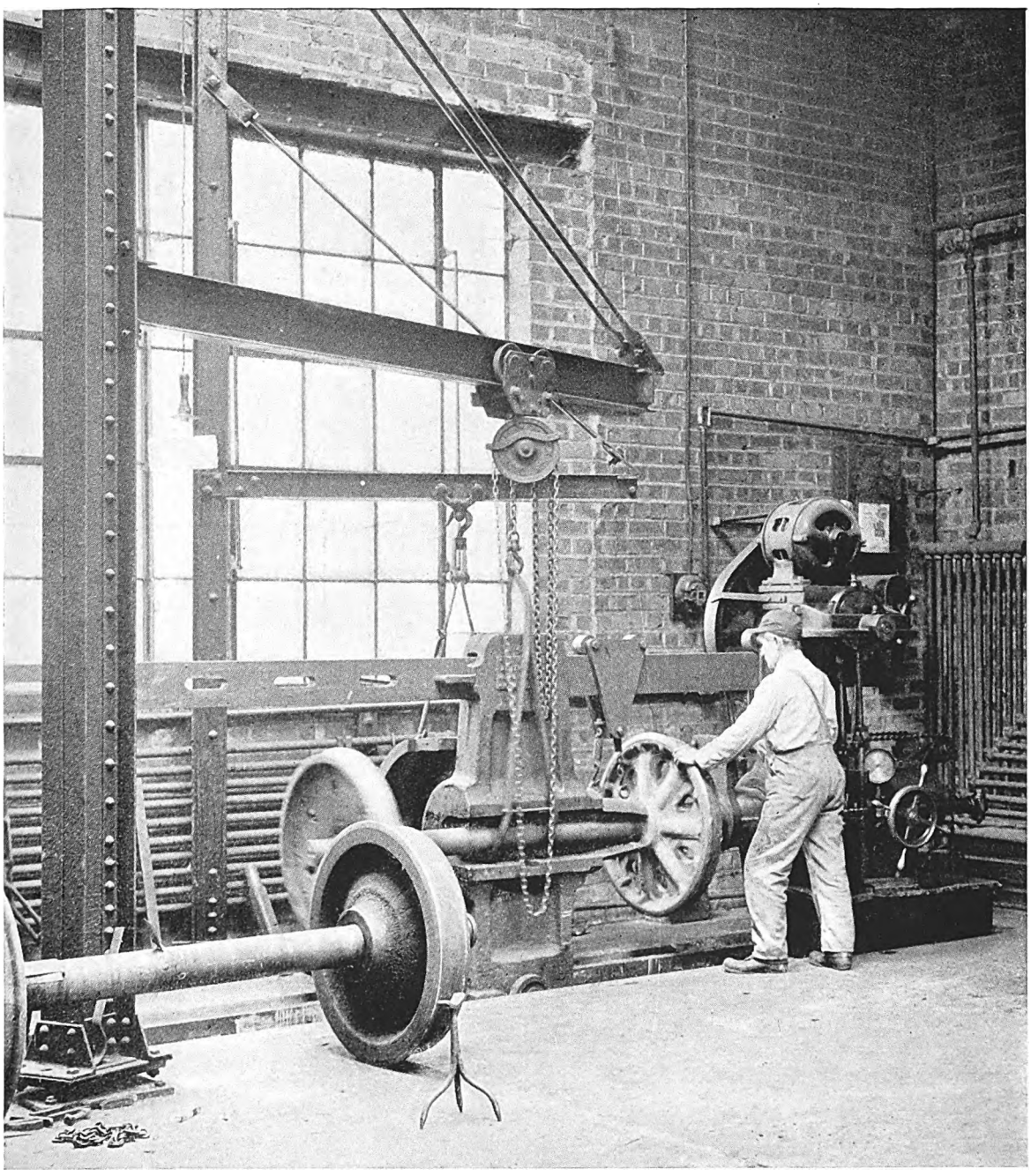
Special Pictorial Section

"Do It Mechanically"

Labor-saving machinery is gradually supplanting hand and muscle methods, but a more extended use of it can well be made by all electric railway maintenance departments. Examples from various cities are shown in the following pages.



One Man, with Proper Equipment, Can Do a Surprising Amount of Work, and at a Minimum of Cost

An example of up-to-date practice is shown in the above illustration—a wheel press in the shops of the Tri-City Railway & Light Company, Davenport, Ia., admirably served by cranes and hoists. With this outfit, a single operator performs all of the various operations with ease.

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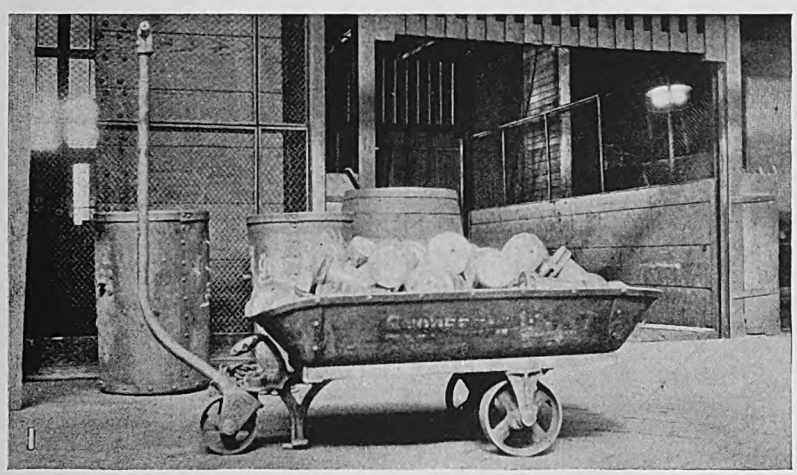
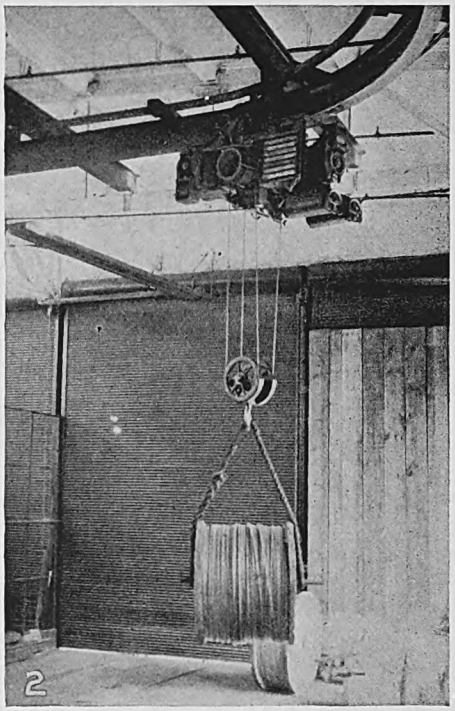
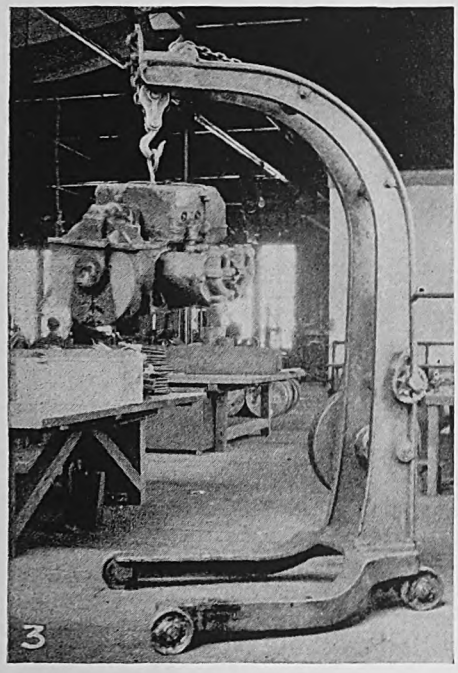






Materials Handling Devices in the Shops of the Chicago Surface Lines

No. 1. Tray for carrying bearings and other material from the stockroom. The handle is removable, while the end is supported by a pedestal.

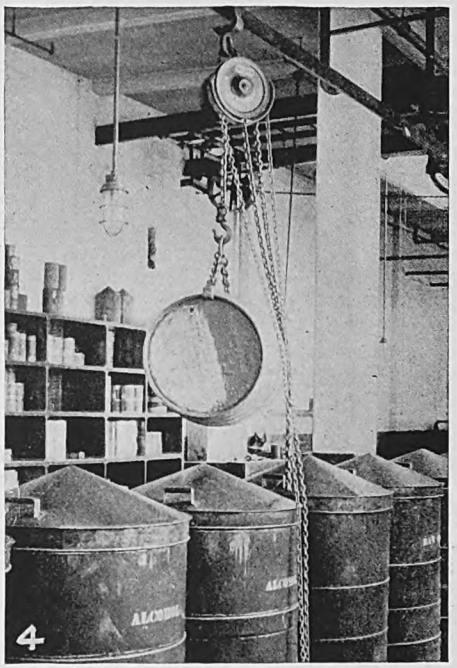
No. 2. Reels of trolley wire and feeder cable are unloaded with an electric hoist controlled by hand from the floor. The overhead track makes a complete loop in the stock room.

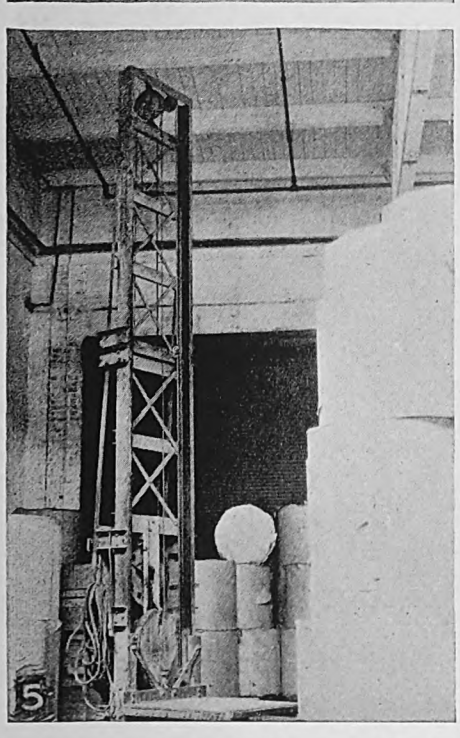
No. 3. Compressors to be overhauled are put on the work bench with a movable hand crane.

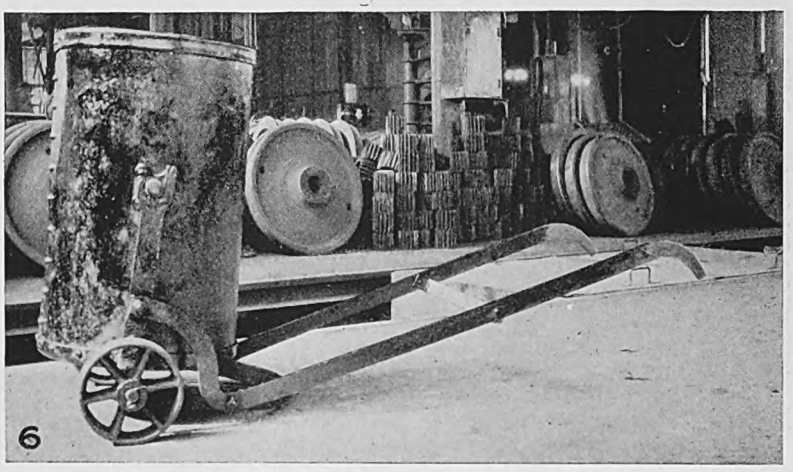
No. 4. The storage drums in the paint supply room are filled directly from the barrel which is hoisted with a 1-ton Yale spur-geared block running on an overhead track.

No. 5. A revolvator for stacking rolls of paper in the storage room. This paper is used for printing transfers.

No. 6. Truck and removable swivel mounted can for handling heavy bulk material.







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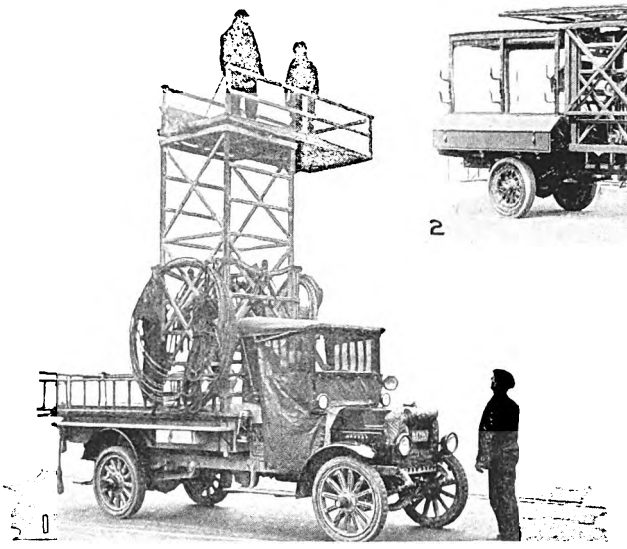
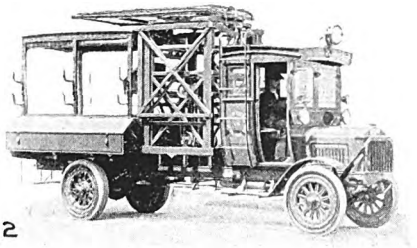
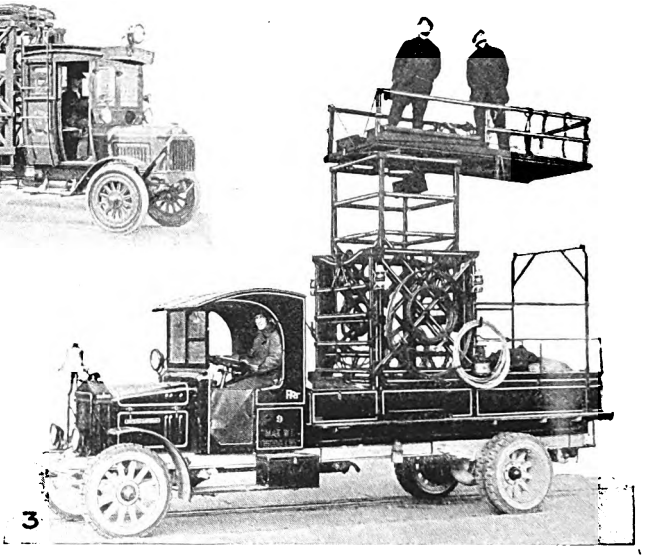
Ever-Ready Tower Trucks Reduce Maintenance Expense and Prevent Delays







No. 1. A Federal tower truck in service on the Detroit United Railways.

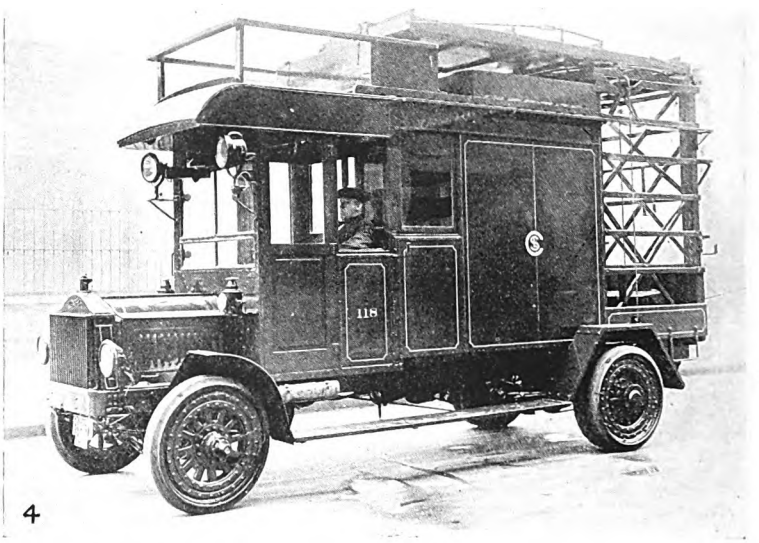
No. 2. Emergency wagon on Standard Motor Truck Company's truck chassis in use by the city of Detroit, department of street railways.

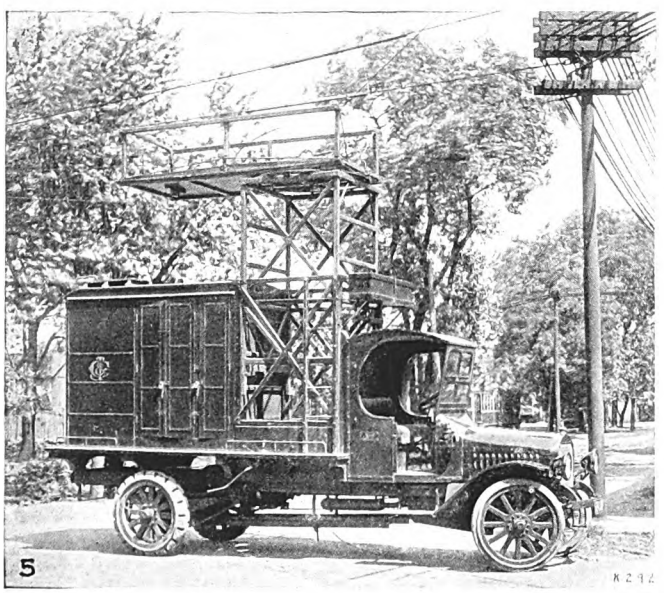
No. 3. Philadelphia Rapid Transit Company's tower truck is built on a two-ton Pierce-Arrow chassis.

No. 4. Specially constructed overhead repair tower wagon mounted on a two-and-a-half-ton Packard truck in service on the Chicago Surface Lines.

No. 5. Overhead tower mounted on a Mack truck in service on the Chicago & Joliet Railway.

No. 6. Three-and-one-half-ton White tower truck of the Public Service Railway, Newark, N. J.





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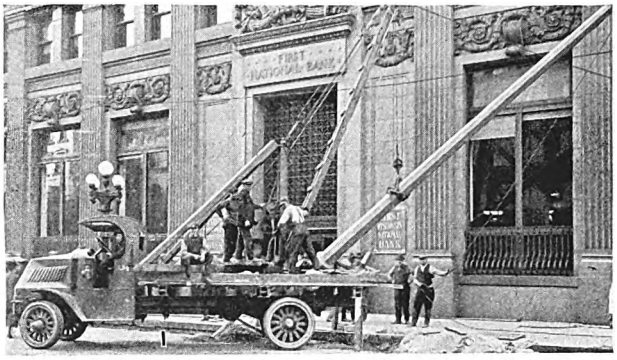
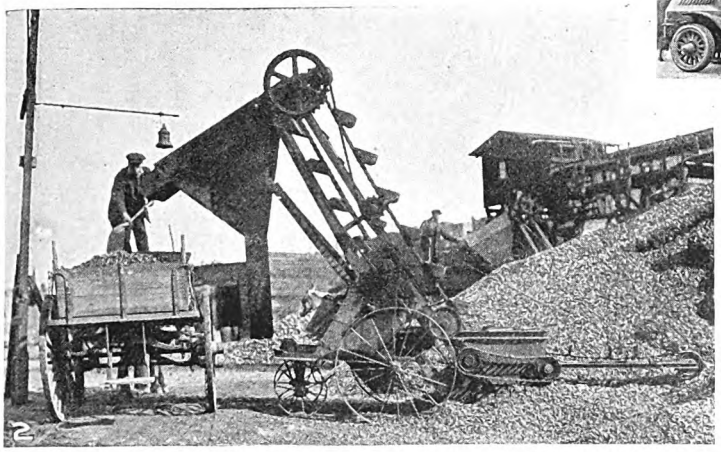
Cranes and Conveyors Have Many Uses in Material Handling





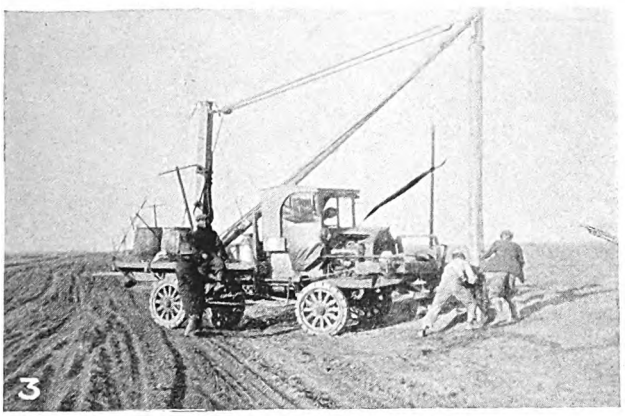
No. 1. Using a Mack truck for emergency handling of poles in Milwaukee. Temporary construction was removed when the job was complete.

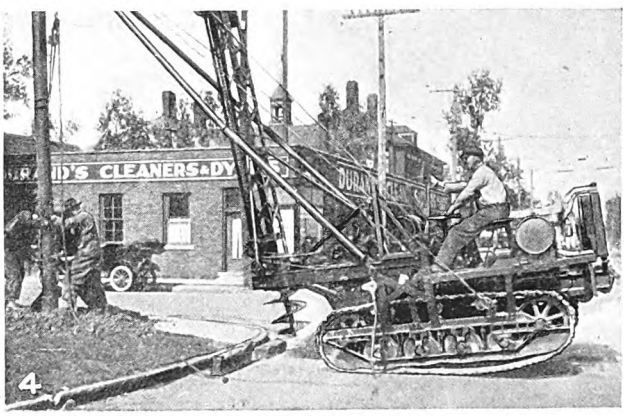
No. 2. Loading coal directly from the pile by means of belt conveyors.

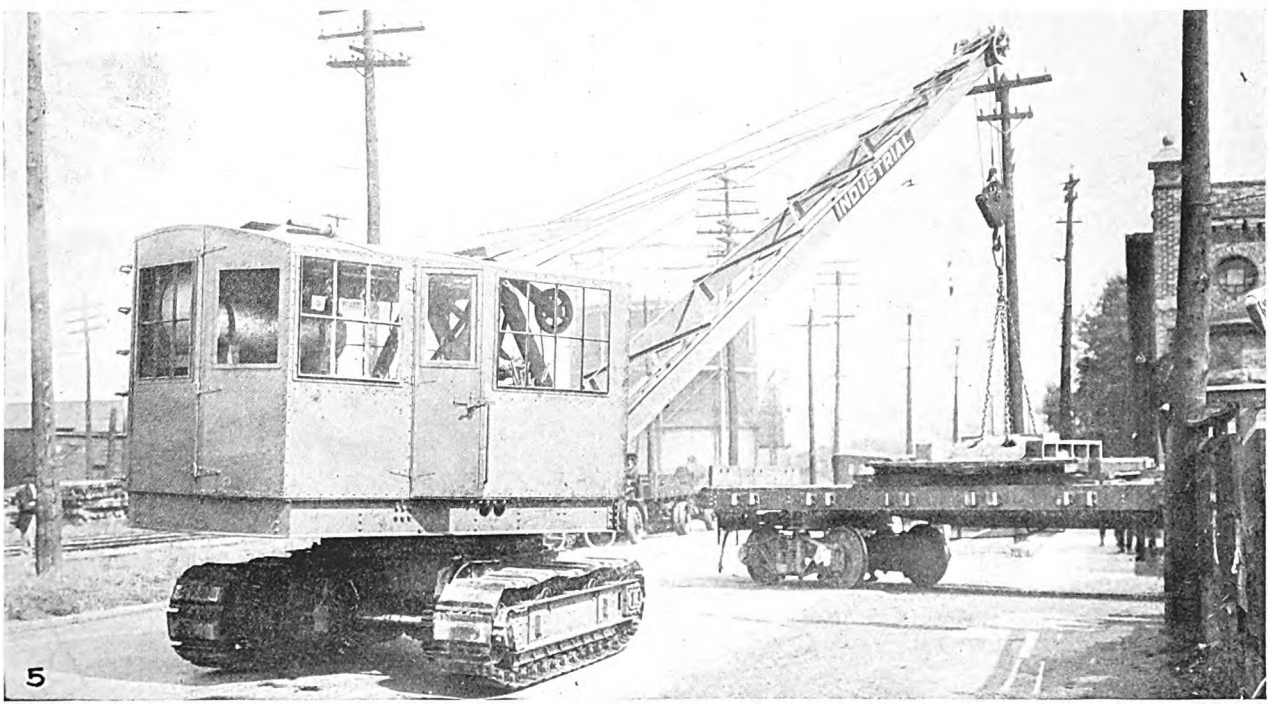
No. 3. Pole-digging and pole-setting equipment mounted on truck in use in California.

No. 4. Digging holes and setting poles with a caterpillar tractor equipment in Detroit.

No. 5. Crawling tractor with Industrial crane for handling heavy track materials.







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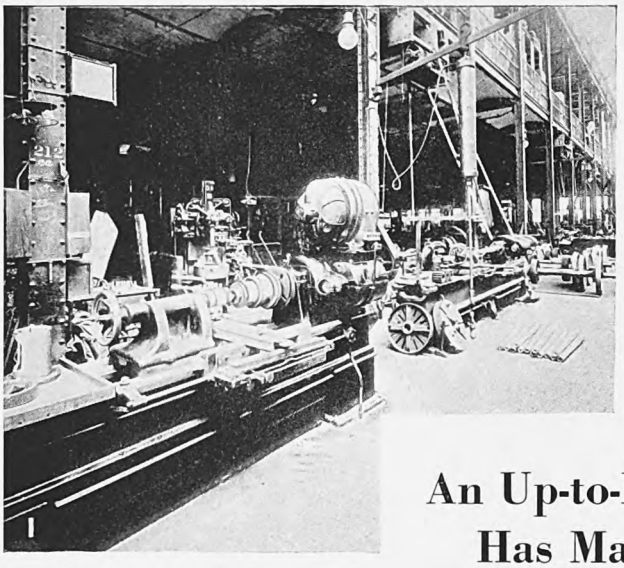
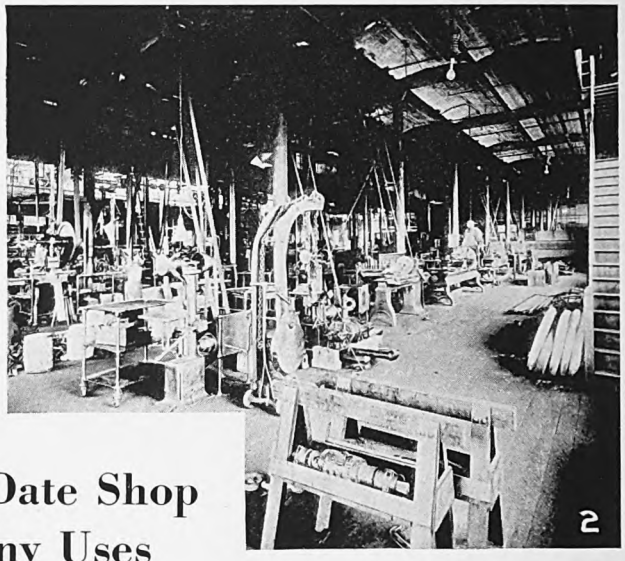
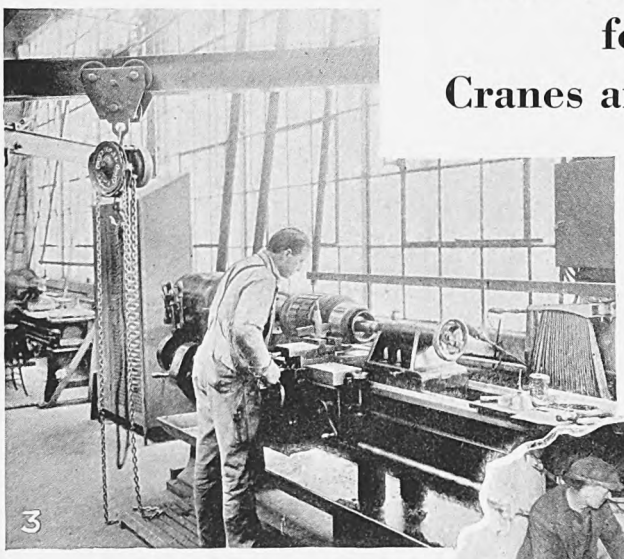
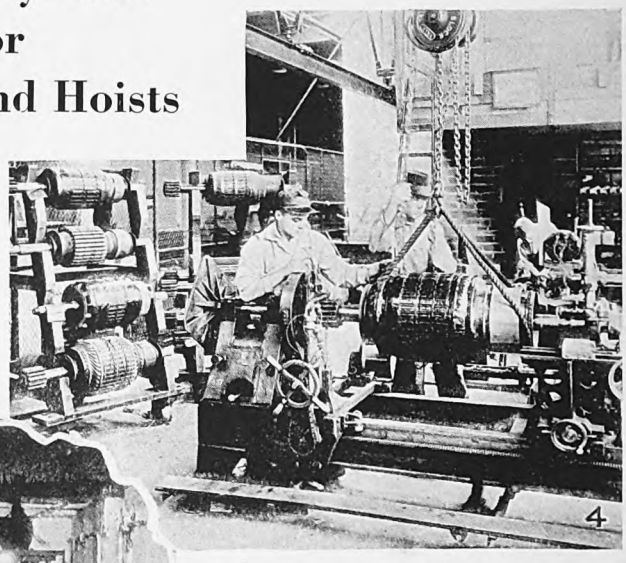
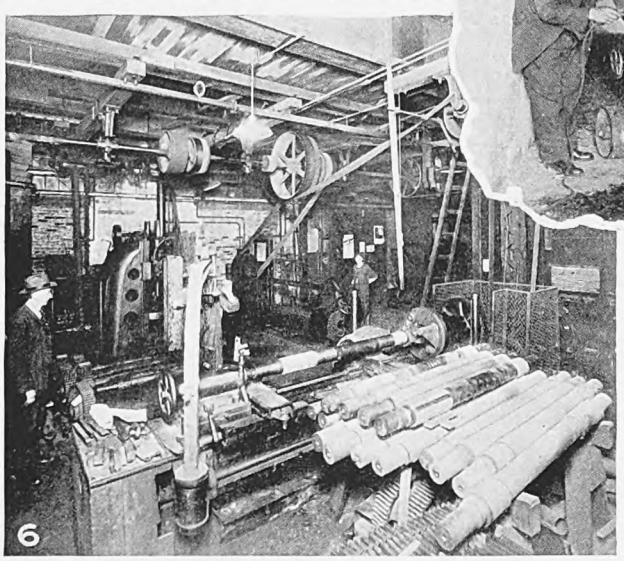


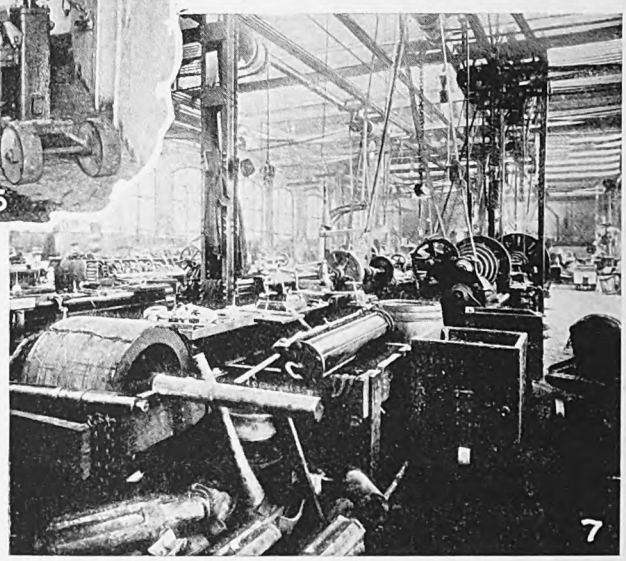


An Up-to-Date Shop Has Many Uses for Cranes and Hoists









No. 1. An air hoist swung from a shop pillar serves two large lathes in the Vincennes Road shops of the Chicago Surface Lines.

No. 2. A portable crane and hoist in the Vincennes Road shops of the Chicago Surface Lines.

No. 3. Overhead traveling chain hoists handle armatures to lathes in the Davenport shops of the Tri-City Railway & Light Company, Davenport, Iowa.

No. 4. An overhead traveling chain hoist handles armatures between racks and lathe in the shops of the Tri-City Railway & Light Company, Davenport, Iowa.

No. 5. A portable air hoist as a handy tool for pits.

No. 6. A hoist is swung from the back of this lathe in the South Side shops of the Chicago Elevated Lines.

No. 7. A variety of hoists and cranes are used in the shops of the Philadelphia Rapid Transit Company.

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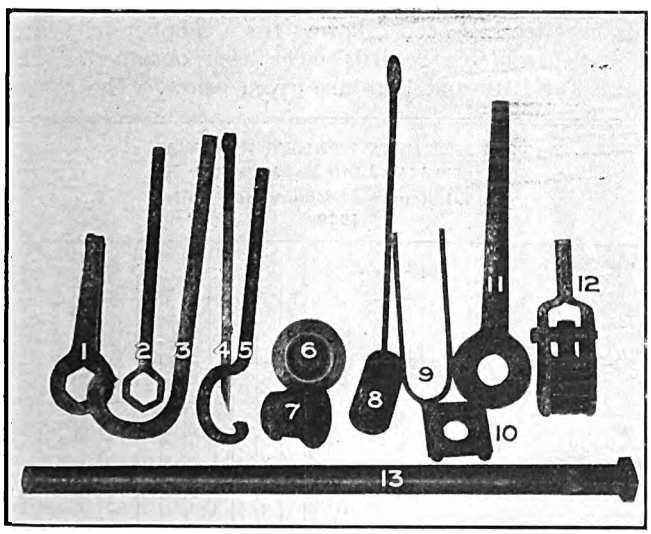
Methods and Equipment for Doing Maintenance Work the Labor-Saving Way

Armature Dismantling Tools Reduce Labor Costs

Efficient Tools of Special Construction Enable Workmen to Remove Parts Necessary in Overhauling Armatures Without Danger of Damaging Detail Parts

ELECTRIC railway shops soon accumulate a large number of special tools for convenience in dismantling and assembling various pieces of equipment. The accompanying illustration shows some tools used by the Eighth Avenue Railroad, New York, for dismantling and assembling various armature parts. Tools Nos. 1, 2 and 3 are used for removing the pinion nut. The spanner, 3, has a projection at the end which fits into the tooth of the pinion so as to keep the armature shaft from rotating. Either of the wrenches 1 or 2 is used for unscrewing the nut; 4 is a coil lifter used in connection with the rewinding of armatures; 5 and 7 are used for removing the core nut. The dowels on the flanged end of 7 fit into the holes of the nut, and the projections on the sleeve portion are provided so that the spanner, 5, will fit over these conveniently and give sufficient leverage for unscrewing the nut; 6 is a jig used for redrilling the holes in the core nut. The tool 8 is used for swedging bushings on armature shafts, so as to provide for returning where they are worn below size. The tools Nos. 9, 10, 11, 12 and 13 are used for removing the commutator ring nut. The



SOME TOOLS USED FOR DISSEMBLING ARMATURE PARTS

wrench, 11, has projections which fit into the holes in the ring nut. No. 10 is a wooden clamp used to hold the wrench, 11, in position, and 9 is a U-shaped strap which fits over the end of the armature shaft and holds the armature down. The ratcheting device, 12, together with its handle, 13, is used for turning the armature, while the wrench, 11, holds the nut stationary. This ratcheting device is constructed of an old pinion, the bore of which has been enlarged slightly so that it will slip over the shaft readily. The keyway in the pinion fits over the key of the armature shaft. The dog shown in the center of the ratcheting tool operates in the teeth of the pinion, so that by placing the long pipe handle, 13, on the end projection of 12, this can be ratcheted back and forth and the armature will be turned. As the commutator end nut is held stationary, this unscrews and is readily removed.

Signal Failures Still Decreasing in Chattanooga

A COMPARISON of signal failures for the Chattanooga Street Railway for the years 1919 and 1920 was given in last year's maintenance issue of the ELECTRIC RAILWAY JOURNAL, dated March, 19, 1921. Similar data for the year 1921 have now been made available through the annual report of the signal department. The accompanying table gives comparisons for the three years 1919, 1920 and 1921.

Trouble Found	1919	1920	1921
Line wires	8	13	5
Fuses blown	29	16	9
Lamps out	15	34	17
Relay trouble	24	22	13
Setting contactor	9	4	4
Restoring contactor	19	7	5
Bad grounds	9	7	6
Pole wiring	10	1	13
No trouble found	13	20	14
Miscellaneous	20	19	8
Totals	156	143	94
	1919	1920	1921
Total operations of all signals for year	1,745,950	1,709,820	1,759,300
Number of operations per failure	11,336	11,954	18,714
Average yearly operations of each block of signals	96,986	85,490	97,964
Average daily operations of each block of signals per day	264	276	240
Number of blocks in service	18	20	20

The original signals were installed some thirteen years ago and have been almost completely rebuilt, part of them in the manufacturer's factory, but most of them on the railway company's property, some few not yet having been completely rebuilt. Twenty blocks of Nachod signals are now in operation. In the first part of the table a comparison of the different kinds of signal trouble is given. It will be noted that there were only thirteen relay troubles resulting from the use of forty relays over the whole of last year. This is equivalent to one relay failure in about three years, which speaks well both for the signal design and maintenance. It will be noted that there was a decrease in all troubles except the one classed as "pole wiring," and this increase was partly caused by a different way of classifying this. Formerly troubles on wires leading from the contactor were classed as "contactor troubles," but now they appear more properly under the head of "pole wiring."

The number of operations per failure was increased

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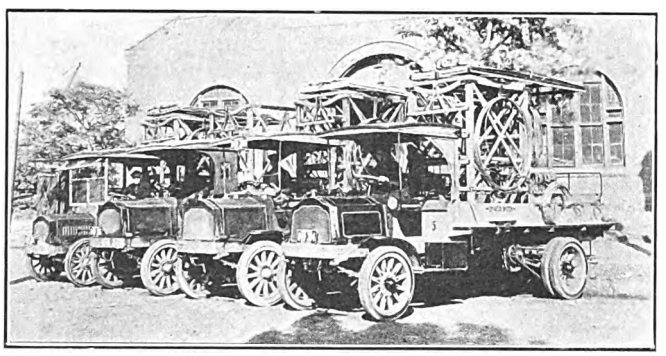
during the year 1921 to 18,714, which is a 35 per cent advance over the past year and about as good as can be hoped for, considering the reconstructed signals and the age of the lines. (A signal operation is here counted as that produced by a car moving under a contactor.) With new equipment throughout, this record might be bettered. There were 4.7 failures due to all causes per block per year, or a failure every 77.6 days.

During the year the signal department of the railway installed two Cheatham automatic switches and went over all the lightning arresters on the railway system, putting them in the best condition possible. The grounds were made of larger capacity than formerly, and an additional 7-ft. length of galvanized pipe was driven at each arrester. Eighty-seven arresters were installed, making a total of 228. On Missionary Ridge an iron casting was buried for the ground of each arrester.

A Fleet of Overhead Repair Trucks

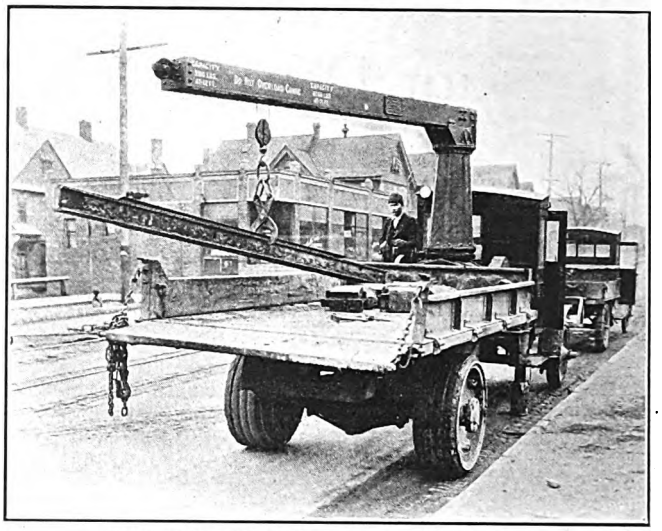
THE accompanying illustration shows a fleet of Packard chain-drive trucks equipped with overhead repair towers in service on the Third Avenue Railway System, New York. These towers are operated by hand



FLEET OF OVERHEAD REPAIR TOWERS

winches which elevate them approximately 20 ft. from the ground to the platform of the tower. The bodies are fitted with tool compartments, wire racks, etc., so that all necessary repair materials can be carried on the truck.

Handling Material with Truck Crane



CONVENIENT WAY DEPARTMENT CRANE TRUCK

THE Milwaukee Electric Railway & Light Company uses a Bay City heavy duty power crane mounted on a Packard truck for handling rails and other heavy railway material. The crane is operated by power taken from the trolley system and has a capacity of 6,000 lb. at 7½-ft. radius. The revolving of the crane base forward and reverse, the travel of the pulley block and lifting and lowering the pulley block are all controlled by shifting levers at the left of the driver's cab.

Tabulating Line Troubles

Memphis Keeps Comparative Records of Troubles Caused by Overhead Construction—Joint Use of Poles by the Utilities

ALL OVERHEAD line troubles are tabulated in Memphis so that the department of overhead lines can tell promptly and accurately exactly how much trouble each part of the overhead equipment has caused. This practice has been followed for a number of years, so that invaluable records have been obtained. The figures for 1919 and 1920 are given below. The corre-

THE MEMPHIS STREET RAILWAY
OVERHEAD LINE DEPARTMENT
Annual Report of Emergency Calls
1919

	Trolley Breaks	Trolley Hangers	Trolley Ears	Trolley Frogs	Trolley Sleeves	Spans	Pull Overs	Guys	Strains	Ltg. Arresters	Light Circuits	Electric Switches	Poles and Fixtures	Miscellaneous	Total
January	3	17	3	0	0	1	6	2	0	1	1	3	1	8	46
February	5	6	5	0	0	3	2	0	0	0	1	3	1	10	36
March	5	10	6	1	0	6	4	1	1	0	6	3	1	10	54
April	1	17	4	0	0	2	0	1	2	0	6	9	2	5	49
May	4	13	7	0	0	4	7	2	1	1	2	8	3	8	60
June	1	25	8	0	0	6	4	5	3	0	10	5	0	12	79
Total for year	19	88	33	1	0	23	23	11	7	2	26	31	8	53	324
Same period last year	35	49	49	5	0	18	4	6	9	1	39	45	6	54	320
July	6	12	10	0	0	5	3	2	0	0	4	7	0	17	66
August	4	7	5	0	0	2	4	0	0	0	0	4	1	3	30
September	5	12	4	0	0	2	2	2	0	0	5	5	1	9	45
October	5	25	11	1	0	3	8	7	3	0	9	7	1	16	96
November	4	8	8	1	0	1	2	5	0	0	2	8	1	4	44
December	3	13	3	0	0	6	5	4	0	0	8	5	1	15	63
Total for year	27	77	41	2	0	19	24	18	3	0	28	36	5	64	344
Same period last year	22	73	19	2	0	10	22	8	1	3	17	21	2	47	247
Total for year	46	165	74	3	0	41	47	29	10	2	54	67	13	117	668
Total last year	57	122	68	7	0	28	26	14	10	4	56	66	8	101	567
Increase or decrease	11	43	6	4	0	13	21	15	0	2	2	1	5	16	101

THE MEMPHIS STREET RAILWAY
OVERHEAD LINE DEPARTMENT
Annual Report of Emergency Calls
1920

	Trolley Breaks	Trolley Hangers	Trolley Ears	Trolley Frogs	Trolley Sleeves	Spans	Pull Overs	Guys	Strains	Ltg. Arresters	Light Circuits	Electric Switches	Poles and Fixtures	Miscellaneous	Total
January	5	14	8	1	0	4	1	3	3	0	7	5	0	7	58
February	5	1	8	0	0	4	2	1	1	0	5	3	0	7	37
March	7	6	4	0	0	4	6	2	1	0	2	8	2	18	60
April	2	10	8	1	0	5	4	1	1	0	3	5	1	8	49
May	0	24	19	0	0	5	4	5	2	0	5	8	4	14	90
June	3	24	17	0	0	4	3	1	3	1	2	7	2	6	73
Total for year	22	79	64	2	0	26	20	13	11	1	24	36	9	50	367
Same period last year	19	88	33	1	0	22	23	11	7	2	26	31	8	53	324
July	5	17	17	0	0	4	5	5	2	0	4	6	1	12	78
August	11	17	9	0	0	7	5	2	0	0	2	10	5	5	73
September	3	9	14	1	0	10	10	2	1	0	1	12	2	17	82
October	10	5	14	0	0	3	2	2	0	1	1	17	5	12	73
November	9	6	9	0	0	2	6	4	1	1	5	13	2	10	68
December	2	4	2	0	0	4	3	7	0	0	14	10	1	12	59
Total for year	40	58	65	1	0	30	31	22	6	1	27	68	15	68	433
Same period last year	27	77	41	2	0	19	24	18	3	0	28	36	5	64	344
Total for year	62	137	129	3	0	56	51	35	17	2	51	104	25	118	800
Total last year	46	165	74	3	0	41	47	29	10	2	54	67	13	117	668
Increase or decrease	16	28	55	0	0	15	4	6	7	0	3	37	12	1	132

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Form 203 **The Memphis Street Railway Company** MSRy.

OVERHEAD LINE DEPARTMENT

EMERGENCY REPORT

Date Jan 14 1922

LINE Jefferson St ON (Inbound / Outbound) TRACK

LOCATION Jefferson & Main

TROUBLE REPORTED Trolley jumping

REPORTED BY Wilkerson TIME 11.30 A.M. / P.M.

BY J. Tarr

REPORT OF EMERGENCY CREW

TROUBLE FOUND Frog out of line

CAUSE OF TROUBLE

LOCATION Main and Jefferson ON (Inbound / Outbound) TRACK

WORK DONE Lining up frog

MATERIAL USED 25 ft. 1/4" galvanized iron wire

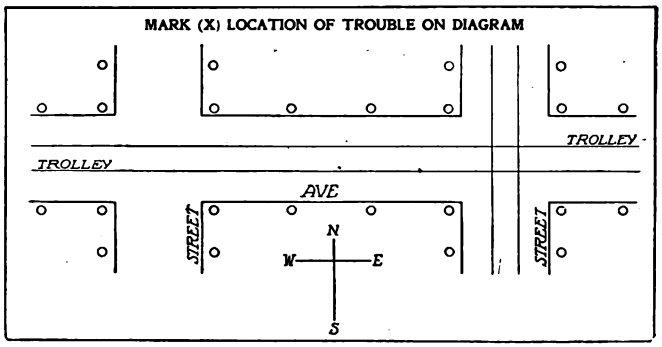
LINE OPEN 12.30 A.M. / P.M. TIME REPAIRS COMPLETED 2.00 A.M. / P.M.

REMARKS

Atkins FOREMAN

NOTE:—EMERGENCY CREW WILL MARK LOCATION OF TROUBLE ON DIAGRAM ON REVERSE SIDE OF THIS REPORT (OVER)

REPORT OF TROUBLE AND RECORD OF MATERIALS USED AND TIME TAKEN IN REPAIRS



REVERSE SIDE OF LINE DEPARTMENT REPORT

sponding figures for 1921 are given at the foot of this column. Decreases are shown by italics.

These tables are made up from daily reports and these in turn from the reports made by the emergency crews to the overhead line department. When repairs are made a typical case will be followed out.

A report is received by telephone from a transportation department inspector that trolleys jump at the corner of Jefferson and Main Streets on the Jefferson Street line, outbound track. This is recorded on the upper part of the accompanying blank. On the lower part of the blank the foreman reports how and when he cared for the trouble, the material used and the time taken to make the repair. On the back of this report is space to enter on a printed diagram, if desired, the location of the trouble. From these reports a monthly table, by days, is prepared. The upper part of the blank used for this purpose is shown.

THE MEMPHIS STREET RAILWAY
OVERHEAD LINE DEPARTMENT
Annual Report of Emergency Calls
1921

	Trolley Breaks	Trolley Hangers	Trolley Ears	Trolley Frogs	Trolley Sleeves	Spans	Pull Overs	Guys	Strains	Lig. Arresters	Light Circuits	Electric Switches	Poles and Fixtures	Miscellaneous	Total
January	4	8	5	0	0	4	8	2	0	0	4	4	0	7	46
February	4	5	4	0	0	1	3	1	0	0	8	11	0	9	46
March	3	7	4	0	0	7	6	4	2	0	8	8	2	9	58
April	3	10	2	0	0	8	7	3	0	0	6	8	3	8	58
May	3	12	10	0	0	4	3	2	0	0	6	9	1	12	62
June	2	8	7	0	0	8	7	2	0	0	1	4	6	10	55
Total for year	17	50	32	0	0	32	34	14	2	0	33	44	12	55	325
Same period last year	22	79	64	2	0	26	20	13	11	1	24	36	9	60	367
July	6	9	10	0	0	6	6	2	1	0	3	6	2	11	62
August	3	5	5	0	0	11	4	3	2	0	4	6	3	10	58
September	6	1	4	0	0	3	2	4	0	0	6	4	2	9	41
October	1	3	6	0	0	4	1	4	1	0	10	5	1	14	50
November	2	8	2	0	0	3	1	1	1	0	9	2	1	7	37
December	1	10	2	1	0	2	4	0	1	0	8	5	0	4	38
Total for year	19	36	29	1	0	29	18	15	7	0	40	28	9	55	286
Same period last year	40	58	65	1	0	30	31	22	6	1	27	68	16	68	433
Total for year	36	86	61	1	0	61	52	29	9	0	73	72	21	110	611
Total last year	62	137	129	3	0	56	51	35	17	2	51	104	25	128	800
Increase or decrease	*26*	*51*	*68*	*2*	0	*55*	*1*	*6*	*8*	*2*	*22*	*32*	*4*	*18*	*189*

THE MEMPHIS STREET RAILWAY
Monthly Report of Emergency Calls
MONTH OF.....192

Date	Trolley Breaks	Trolley Hangers	Trolley Ears	Trolley Frogs	Trolley Sleeves	Spans	Pull Overs	Guys	Strains	Lig. Arresters	Light Circuits	Electric Switches	Poles and Fixtures	Miscellaneous	Total
1															
2															
3															
4															
5															
6															
7															

FORM OF DAILY REPORT

The headquarters of the overhead line department are at the main carhouse on Beale Avenue, and it is here that the emergency line crews are stationed.

JOINT USE OF POLES

For some fourteen years the utilities in Memphis have joined in the use of poles to a considerable extent. It is the practice to carry on one side of the street the power cables and the railway feeders, the former over the latter and both above the span connection. On the other side of the street are the telephone wires and telegraph wires. Each company naturally cares for repairs and renewals of its own equipment, but they join in the renewal of poles.

The practice in this respect is for the line department in each company to make a joint inspection in the early spring to determine which poles need replacement, then to divide between the several companies the number of poles to be replaced. An effort is made in this division to assign the poles to be replaced in one part of the city to one company; those in another part of the city to the second company, etc. In this way construction costs are reduced. Each company naturally transfers its own attachments from the old pole to the new.

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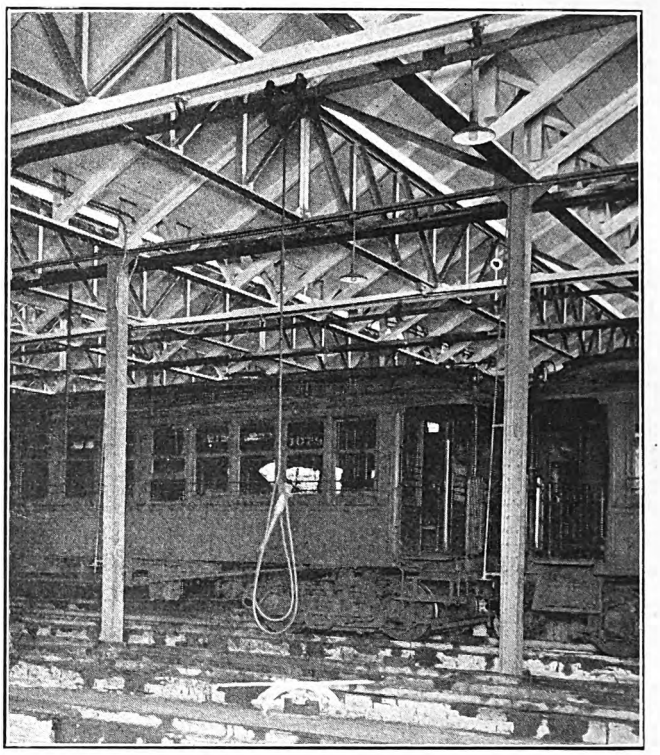
Handling Cars Inside Shops

For Cars Not Equipped with Trolleys Some Form of Overhead Trolley System Is Quite Necessary to Safeguard Employees from Accident

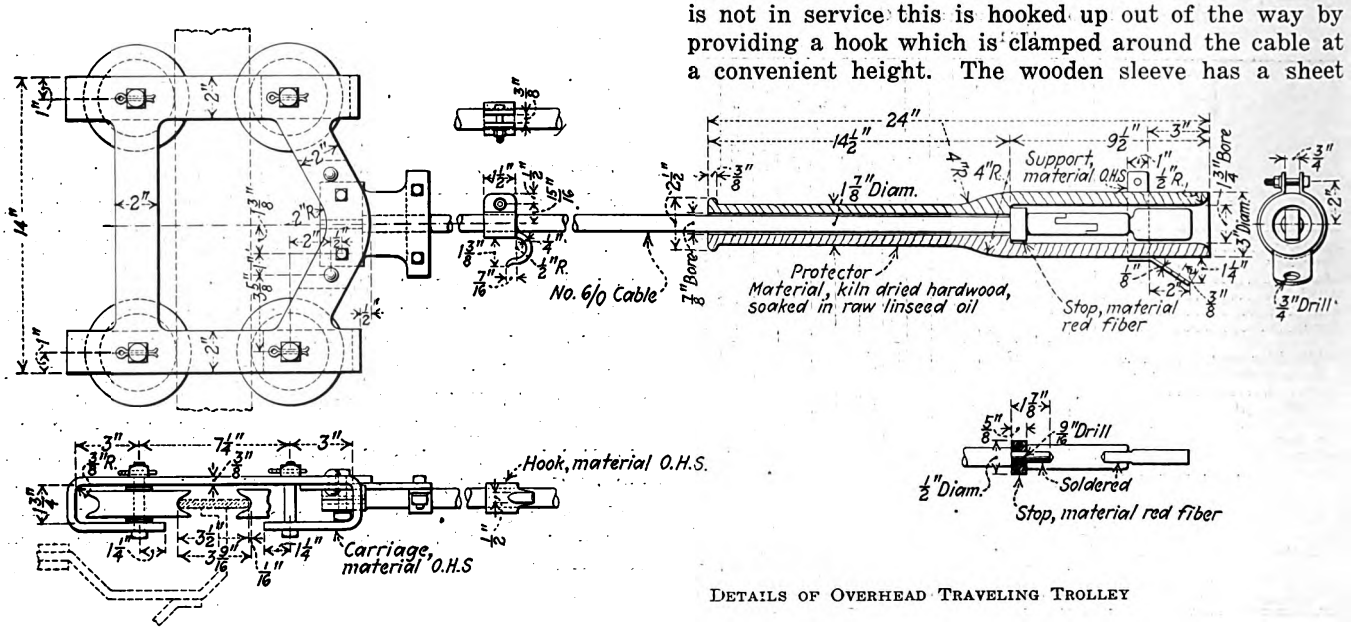
ELECTRIC railways using the third-rail contact system have a somewhat inconvenient problem to solve to provide for shifting equipment inside the shop. The third rail installed in such places is a continual source of danger to workmen and the use of switching locomotives or working cars equipped with trolleys for moving cars is a great inconvenience as well as being costly. On some systems the third rail is laid in the yard up to the entrance of the shop, and no contact system is provided inside the buildings themselves. In placing a car or train over the pits it is the practice to get up sufficient speed on entering so as to be able to coast into position. In removing cars at such shops it is a common practice to use a long jumper which can be held on the third rail outside the shop while the other end is held on the contact shoe of the car to be moved, or where train operation is used the head car of the train is used with the jumper to pull out the remainder of the train. This system, however, has an element of danger in that proper care is not always exercised by workmen in attaching the contact to the third rail or in holding the other end on the contact shoe of the car to be moved. Serious burning and flashing of the employees have resulted in many cases. Where shops are long this method cannot be used, as it is frequently necessary to move a car at the back of the shop, and in this case an exceedingly long jumper would be necessary.

Accompanying illustrations show a form of overhead traveling trolley used by the Brooklyn Rapid Transit Company in its shops. This employs an overhead iron framework, insulated, so that this forms the source of power. A carriage with four contact wheels runs along this contact system with a flexible cable and protected contact on the end of sufficient length to reach to the contact shoes of the cars to be moved. The framework of the carriage is constructed of ⅜-in. strap iron with a terminal and clamp at the bottom to receive and hold the cable. A well-insulated cable of flexible construction is used for conducting the current. In addition to the rubber insulation either a double or triple braid is quite essential to insure long life and prevent injury.



OVERHEAD TRAVELING TROLLEY SYSTEM IN BROOKLYN RAPID TRANSIT COMPANY'S SHOPS

The bottom contact is connected to the cable through a standard knuckle joint connector so that this can be replaced or renewed whenever necessary. As a protection for this bottom contact a wooden sleeve is used. This is made of kiln-dried hardwood, which has been soaked in raw linseed oil. The upper end of this is provided with a hole to receive the cable and the bottom end is enlarged so as to receive the terminal and knuckle joint connector. A stop of red fiber fits over the end of the cable just above the knuckle joint connector and prevents the wooden sleeve from dropping off. When hanging down this protects all parts of the contact and when making contact with the third rail shoe on the car to be moved this slips up on the cable so as to expose the lower end of the contact. The workman is thus effectively protected at all times and there is no danger of his coming in contact with live parts. When the contact is not in service this is hooked up out of the way by providing a hook which is clamped around the cable at a convenient height. The wooden sleeve has a sheet



DETAILS OF OVERHEAD TRAVELING TROLLEY

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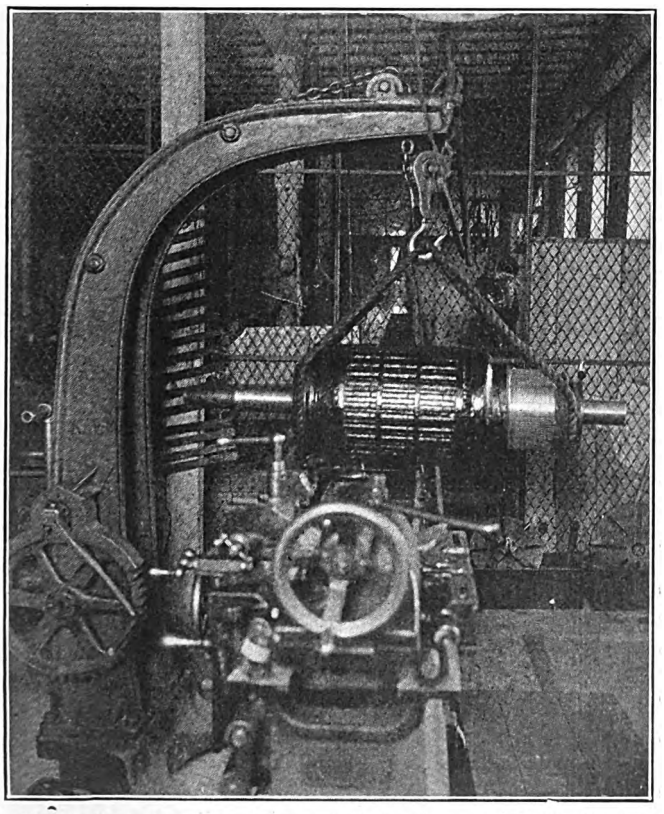
steel clamp with a hole so as to fit over the hook on the cable. Details of construction of the carriage, the cable and the bottom protection are shown in one of the accompanying illustrations. Another shows its use in one of the shops of the Brooklyn Rapid Transit Company.

Serving Shop Machines with a Portable Crane

IN SHOPS which have line shafting and belts it is often very difficult to provide overhead traveling trolleys or cranes for handling heavy work in and out of the various shop machines. Even where other material handling equipment is available, a portable crane will be found a great labor and time saving piece of equipment. The accompanying illustration shows a Canton Foundry & Machine Company's No. 3 portable floor crane and hoist serving a lathe in the shop of the Eighth Avenue Railroad, New York City. One man and this type of crane handle the job of putting an armature in position for turning the commutator with perfect ease. This crane serves the larger machine tools, such as drill press, boring mill and lathe, and handles the heavier equipment parts such as armatures, motor shells, truck frames and the like. With the older hand method of lifting these parts from three to six men were necessary, so that often high-priced machinists were taken from their work to help in a tiring and unattractive operation. If a saving of 75 cents per day results in labor from the use of such a portable crane, this would amount to $19.50 each month of twenty-six days, or



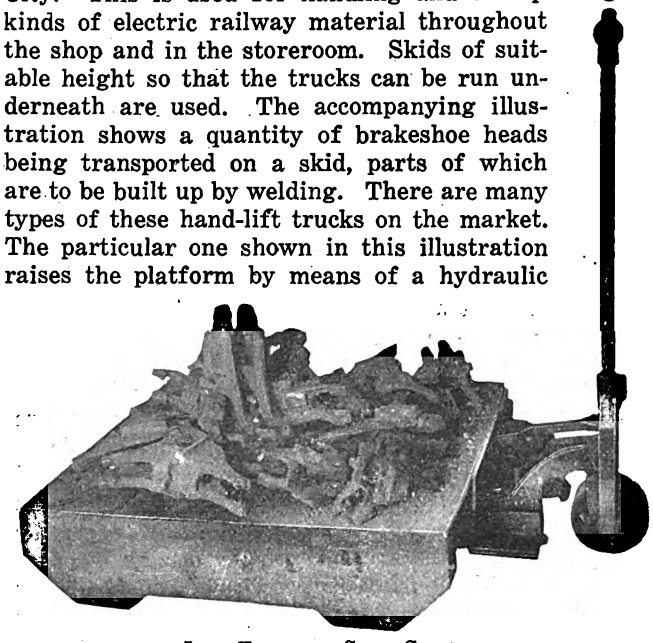
HANDLING A RAILWAY ARMATURE WITH PORTABLE FLOOR CRANE

$234 per year. In addition to this saving there would also be a loss of production with different machines standing idle while their operators are assisting in lifting a piece of apparatus.

The crane shown has a total height of 7 ft. 6 in., a lift of 6 ft. 4 in. and a lifting capacity of 5,000 lb.

Lift Trucks Are Handy Equipment for Railway Shops

THE accompanying illustration shows a lift truck in the shops of the Eighth Avenue Railroad, New York City. This is used for handling and transporting all kinds of electric railway material throughout the shop and in the storeroom. Skids of suitable height so that the trucks can be run underneath are used. The accompanying illustration shows a quantity of brakeshoe heads being transported on a skid, parts of which are to be built up by welding. There are many types of these hand-lift trucks on the market. The particular one shown in this illustration raises the platform by means of a hydraulic

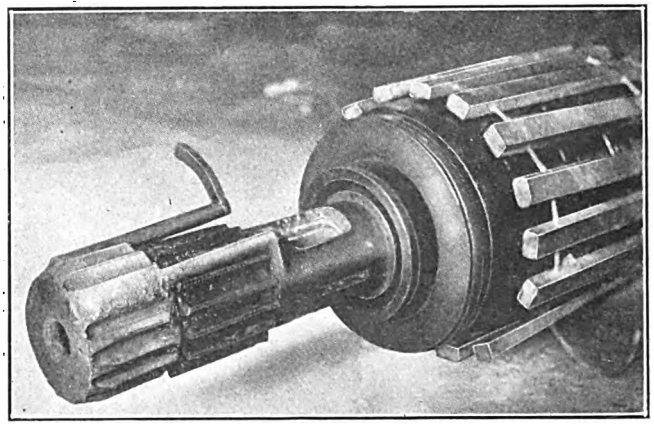


LIFT TRUCK IN SHOP SERVICE

cylinder. The lifting is accomplished by moving the handle backward and forward. When not in use, the handle is held by a catch in the upright position so that it cannot drop to the floor and is always in easy reach of the operator. The truck can be moved and steered with the handle in the upright position if found necessary in close quarters. Different heights of lift are available as are found necessary to clear different shop obstructions. The pressing of a pedal operates a hydraulic release and lets the load settle gently to the floor. The handle does not engage the angle iron frame, so that when the load is released there is no tendency for the handle to fly up and injure the operator.

Tool for Making Pinion Installation a One-Man Job

SOMETIMES shop operations which ordinarily require the services of two or more men can be readily carried out by a single worker by the aid of a few inexpensive special tools. In installing pinions on an armature shaft it is usually necessary to use a sledge and



THIS DEVICE ENABLES ONE MAN TO INSTALL PINION

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block to force the pinion into position, even though it has been previously heated so that it will go on without difficulty. The usual method would require the services of two men, one to swing the sledge and the other to hold something against the end of the pinion so as to prevent injury. The accompanying illustration shows a simple device used by the Eighth Avenue Railroad, New York, N. Y., which enables this operation to be done by one man. The device is made from an obsolete pinion and has two round prongs which extend inward and fit into the teeth of the pinion which is being installed. At the inside end of these rods are two dogs which drop into position around the shaft and hold the tool firmly so that it will not fall off even though a glancing blow is struck. The rods are welded to the face of the old pinion and the bore has been enlarged sufficiently so that it will go around the shaft without difficulty.

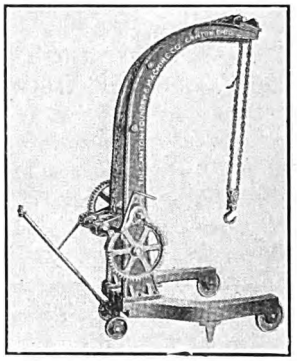
Why Old Railroad Ties Are Burned

THE question as to why worn-out crossties are burned by railroads instead of allowing people to take them for fuel has been answered by Samuel Porcher, general purchasing agent of the Pennsylvania Railroad, in which he states that efforts have been made to interest dealers in firewood in buying the old ties, but thus far without much success. The causes appear to be that the old ties are often dirty; that they contain stone, grit and slag wedged in the cracks which might injure the saws used in cutting them; that in many cases they are partly decayed; that they are dried out and that their fiber is more or less crushed, so that they burn out quickly. For these reasons dealers have been unwilling to pay the railroad company enough to cover the cost of collecting the ties and delivering them to a point at which they could be removed.

Efforts have also been made to dispose of old ties in such ways as for wood pulp purposes, for extraction of chemicals, for burning and sale of the ashes for fertilizer, and for manufacture into charcoal, but without success.

Some ties have been sold to purchasers living on or near the right of way who buy them at nominal prices, usually at from 10 to 15 cents apiece. Such means of disposal is practicable only where the ties can be delivered at a public crossing or other points so that they can be obtained safely by the user and where the cost of delivering them is not greater than the nominal prices obtainable. The company feels that it cannot allow the public to go promiscuously over its tracks and through the yards to gather up old ties, as this would be practically letting down the bars against trespassing on the tracks, an evil against which the Pennsylvania Railroad has struggled for years and which has been the cause of about half of the fatal accidents on railroads in the United States.

Back-Geared Portable Crane and Hoist



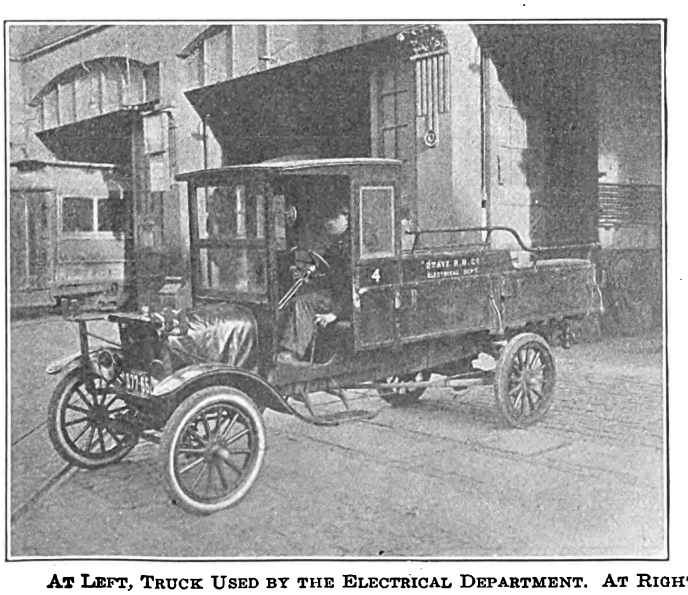
DOUBLE GEARED PORTABLE CRANE AND HOIST

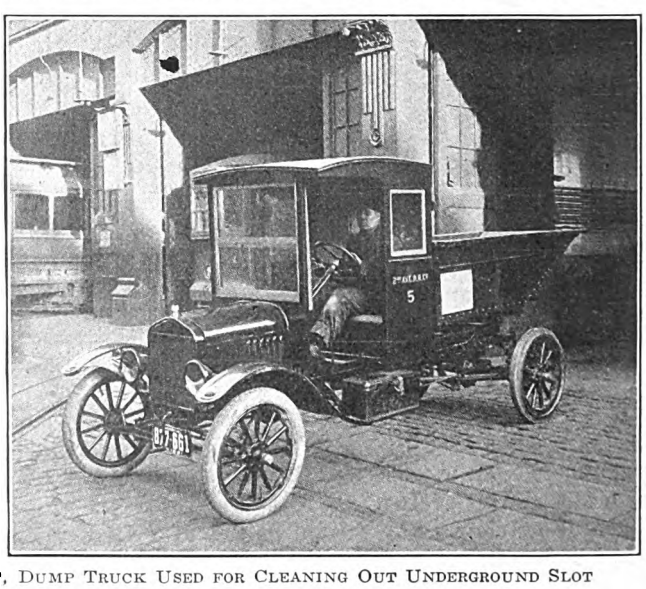
FOR handling loads in excess of 4,000 lb., the Canton Foundry & Machine Company, Canton, Ohio, have recently brought out a double-geared portable crane and hoist. As both shafts are squared to receive the lifting cranks, the load can be lifted on either the single or the back gear. When handling light work and where speed is desirable, lifting should be done on the single gear, but when ease of operation is desired with heavier loads, the double gear should be used for lifting. The various sizes manufactured can be furnished with this additional equipment.

Light-Weight Trucks Prove a Convenient Electric Railway Accessory

ACCOMPANYING illustrations show two light-weight trucks constructed on Ford chassis by the Second Avenue Railroad, New York, N. Y. Truck No. 4 was built essentially for transporting tools used by the electrical department while making repairs in the underground conduit system. There are four brackets on each side of the car body which are used for carrying channel rails. Convenient bins and tool boxes are provided along the sides and back of the driver's cab which can be locked. The tops of the bins have flat covers which are used for seats and the pipe railing along the sides are found very convenient.

The No. 5 truck, also built in the shops of the company, on a Ford chassis is a dump truck. This is convenient for cleaning out the underground conduit slot.





AT LEFT, TRUCK USED BY THE ELECTRICAL DEPARTMENT. AT RIGHT, DUMP TRUCK USED FOR CLEANING OUT UNDERGROUND SLOT

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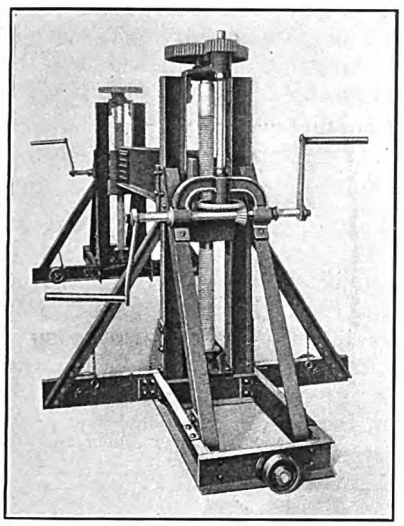
What's New from the Manufacturers

A Portable Hoist for Shop Use

A TYPE of portable shop hoist has been placed on the market by Fox Brothers & Company, New York City, for use in shops which are not fitted with overhead traveling crane equipment or in places which are inaccessible to cranes, or for use while cranes are in use handling other parts.



PORTABLE SHOP HOIST FOR RAISING CARS

A complete equipment consists of four separate jacks and two cross girders. Each jack is mounted on cast-iron wheels with flat treads so that they can be moved from place to place with little effort. These wheels revolve on shafts attached to eccentric bearings, held in place by pins. When the jacks are in position the pins are removed from the bearings, allowing the wheels to rise and the entire base of the jack to rest on the shop floor. The framework is constructed of structural steel shapes and the members are strongly riveted together with gusset plates. Each jack is operated by a pair of handles which turn a shaft on which is mounted a miter gear, which transfers power to a bevel-gear shaft, at the upper end of which is attached a pinion meshing with a large spur gear keyed to the main screw. When this screw is revolved it raises and lowers the nut or raising block. When the hoist is in its lowered position the cross girders are 2 ft. 8 in. from the floor level. They can be raised to the extreme height of 6 ft. 3 in., giving a total movement of 3 ft. 7 in. The working capacity is 30 tons.

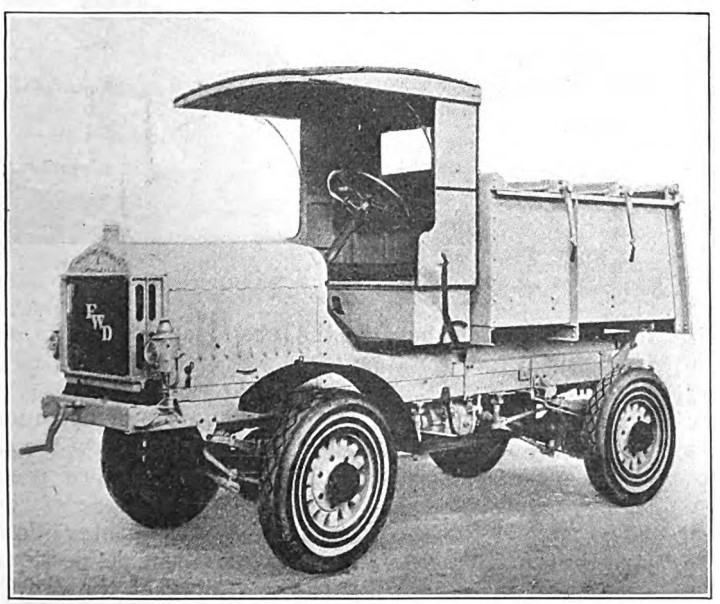
Convenient Truck for Way Department

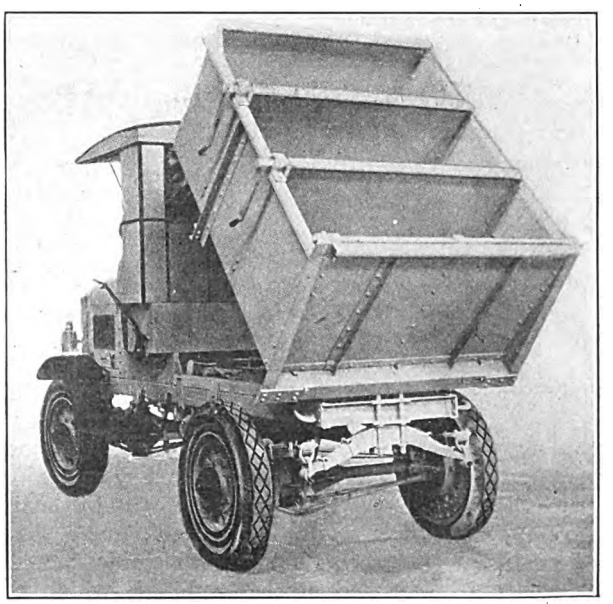
A RECENT type of truck for road building has been placed on the market by the Four Wheel Drive Auto Company of Clintonville, Wis. This type of truck has an extremely short wheelbase of 105 in., which gives it an exceptionally short turning radius—sometimes very essential on work of electric railways. This truck is designed to carry a three-batch load of 3 tons capacity. The body is operated by a horizontal hydraulic hoist and the tail gates can be opened individually. The truck is also designed to be used as a tractor for trailing loads to the concrete mixers and for hauling road machinery. Some of the governing dimensions are given in the accompanying table.

DIMENSIONS AND CAPACITY OF TRUCK FOR ROAD CONSTRUCTION

Capacity	6,000 lb.
Allowance for body and hoist	2,400 lb.
Weight of chassis with pressed-on tires	6,175 lb.
Wheel base	105 in.
Tread, front and rear	60 in.
Turning radius	20 ft. 6 in.
Speed	15 m.p.h.
Wheels and tires	36 in. x 7 in. front 46 in. x 8 in. rear
Clearance under lowest part of axle	9 11/16 in.
Clearance under transmission	15 in.
Length of frame	166 in.
Total over-all length of car including starting crank	181 in.
Width of frame	36 in.
Total width of chassis over hub cap	74½ in.
Capacity of gasoline tank	20 gal.
Motor	Wisconsin, 4-cycle, 4-cylinder, 4½ in. bore, 5½ in. stroke

Three speeds forward and one reverse are provided. Beginning with the transmission the speed is gradually reduced. The transmission has a reduction of 4 to 1 low speed, 2 to 1 second speed, 4.13 to 1 reverse speed and a direct speed of 1 to 1 on high. The second reduction of speed is made in the sub-transmission of a silent gear drive, having a driving pinion with fifteen teeth and a driven pinion containing the center differential of thirty-one teeth, making a reduction of 2.06 to 1. The third and final reduction is made on a differential of the rear and front axles, having a reduction of 4.30





AT LEFT, SIDE VIEW OF TRUCK FOR ROAD CONSTRUCTION. AT RIGHT, BODY HOISTED TO DISCHARGE POSITION

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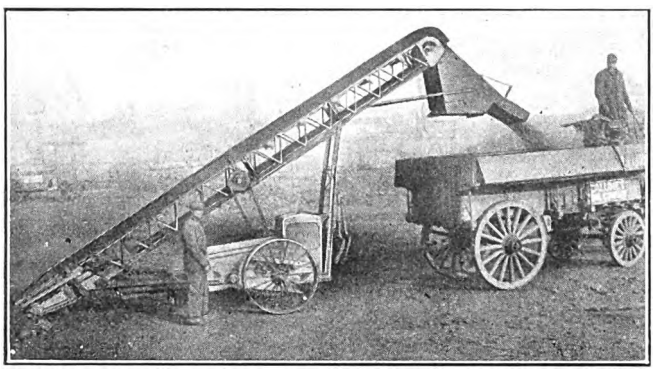
to 1, making the total reduction as follows: 35.6 to 1 on low speed, 17.8 to 1 on second speed, 36.7 to 1 on reverse speed, and 8.9 to 1 on high speed.

The springs are made of alloy steel, semi-elliptic front and platform spring rear. The drive is taken through the springs. Torsion rods are provided to take up the torque of the axles.

New Conveyor a Labor Saver

A NEW type of portable self-propelled belt conveyor has recently been placed on the market by the Barber-Greene Company, Aurora, Ill. It is called the B-G U-Belt Loader and its new features include self-feeding, self-propelling and one-man control. It is being furnished in two sizes with 12-in. and 18-in. U belts. The 12-in. model has a capacity of 50 tons of coal per hour, or 70 tons of sand and gravel per hour. The 18-in. model has a capacity of 75 tons of coal per hour, or 100 tons of sand and gravel per hour. Either

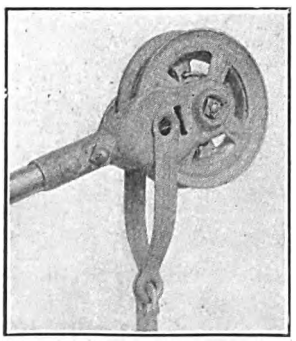


LOADING COAL FROM A PILE INTO A WAGON

gasoline motor or electric motor drive is furnished as desired. The belt consists of a special four-ply, ⅛-in. rubber-covered belt, flanged on the side with steel overlapping clips and cupped flights across the belt every 18 in. Cast-iron shoes support the belt on its return. An adjustable spout is furnished with each machine and a wire dust screen, with mesh to suit conditions, is furnished as an extra.

This is essentially a one-man machine, and a single operator can load trucks or wagons and transport the machine from one location to another. One man can load mine-run Pocahontas coal from a storage pile into a truck or wagon at the rate of 5 tons in seven minutes.

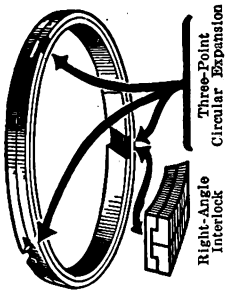
Trolley Wheel with Stationary Guide Flanges



TROLLEY WHEEL WITH STATIONARY FLANGES

THE H. H. Trolley Supply Company, Cleveland, Ohio, has recently brought out a new type of trolley wheel with steel guide flanges on the outside which prevent fouling on wires. It is claimed that much of the trouble from wheels leaving the wire is due to a tendency for them to roll off and that the stationary guide flanges assist the wheel in maintaining its grip upon the wire. The two guide flanges are made from cold-rolled steel stampings, which are retreated to prevent wearing of the sides of the trolley wire. These flanges are interchangeable, giving eight different wearing positions. In the construction of the rotating parts, especial care is taken to insure proper balance and true rotation of the wheel upon its axis.

New Piston Packing Ring

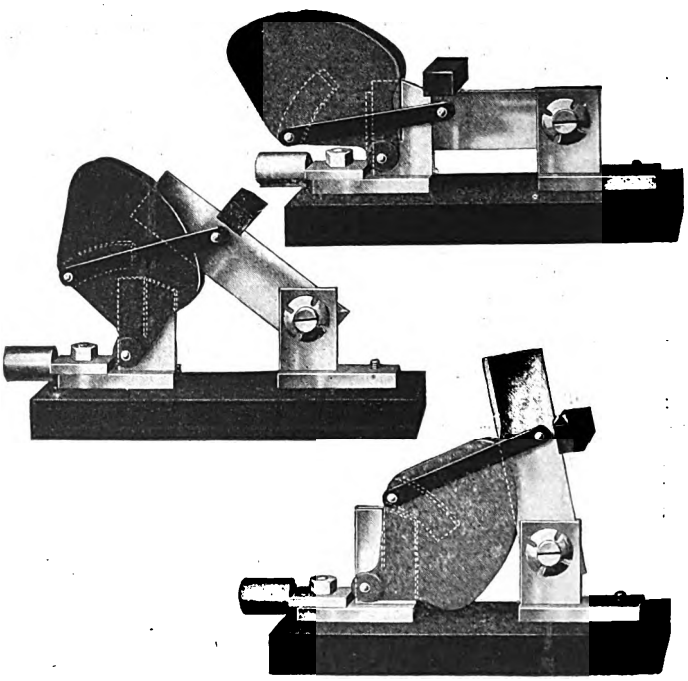


CIRCULAR EXPANSION PISTON RINGS

THE accompanying illustration shows the details of construction of the Zelnicker Ever-Tyte Piston Ring. The type of construction provides for a three-point expansion and a right-angle interlock to insure tightness. The manufacturers claim that the use of these rings makes the reboring of round cylinders unnecessary. These piston rings are furnished by the Walter A. Zelnicker Supply Company, St. Louis, Mo.

600-Volt Switches with Protecting Barriers

ACCOMPANYING illustrations show the Snuf-arc type of 600-volt knife switch being introduced by the Trumbull Electric Manufacturing Company, Plainville, Conn. This switch is of the usual construction except that it has a swinging molded barrier on each of the contact jaw posts. This hinged barrier is operated by an insulated connecting rod attached to each blade in such a way that when the blade leaves the jaw posts



OPERATION OF MOLDED BARRIER FOR SWITCHES. TOP, BLADE IN CONTACT. CENTER, BLADE BREAKING CONTACT. BOTTOM, CIRCUIT OPEN

the barrier swings between the breaking points. The arc is thus effectively extinguished without danger of side flare.

The barriers used are substantially made of fireproof insulating material molded into one piece. A heavy center piece swings closely over the contact jaw post, and two wide flat side sections inclose each side of the jaw post and the end of the blade. The center piece stretches and breaks the arc, while the side sections prevent the side flare and the spreading of the arc to adjoining posts or to the sides of the inclosing cabinets.

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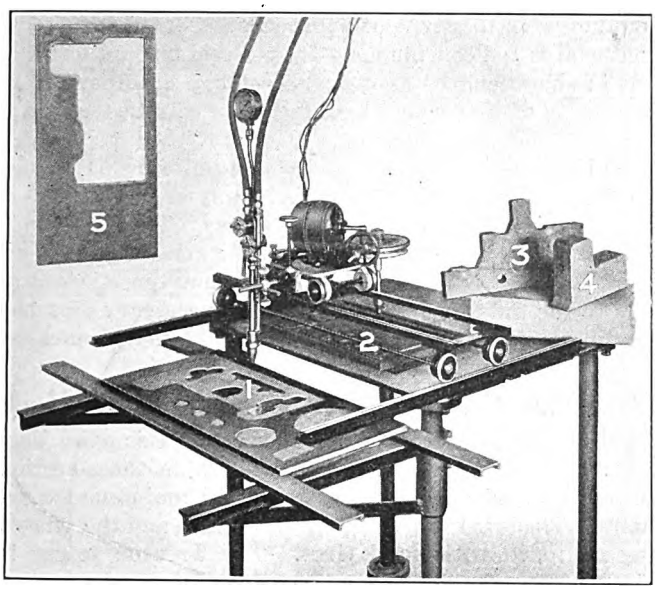
New Automatic Torch Cutting Machine

THE General Welding & Equipment Company, Boston, Mass., is marketing a new automatic gas torch cutting machine. The equipment is mounted on two carriages, the upper one having four wheels running on a track and the lower carriage also having four wheels running on a track at right angles to the upper one. The operation of the two carriages is similar to that of a traveling crane, and with the gas torch mounted on the upper carriage it will cover any point in a horizontal plane within the capacity of the machine. The cutting torch is mounted on one side of the upper



AUTOMATIC GAS TORCH CUTTING MACHINE

1—Steel plate with various shapes cut out. 2—Fiber template with pattern for No. 1. 3—Die for trimming crankshafts. 4—Part of trimming die cut out of 2-in. armor plate. 5—Steel plate showing trimming die cut out.

carriage with a torch adjuster, while on the opposite side is mounted the driving and tracing system. As the torch and tracing mechanism are mounted on the same carriage, they are rigidly connected.

The driving and tracing mechanism is carried by a shaft which causes the cutting parts to follow a definite path. The shaft is provided with four driving pins which follow in slots of the driving members slipped loosely over the shaft. The driving member rests on the inclined edge of the template partly through its own weight and with the additional pressure of an adjustable spring. The conical end is knurled and hardened so as to insure a reliable frictional driving engagement with the inclined face. The shaft also carries the small, highly-polished tracing roller, slipped loosely over a small pin at the lower end of the shaft. This roller fits loosely in the polished groove of the lower part of the template.

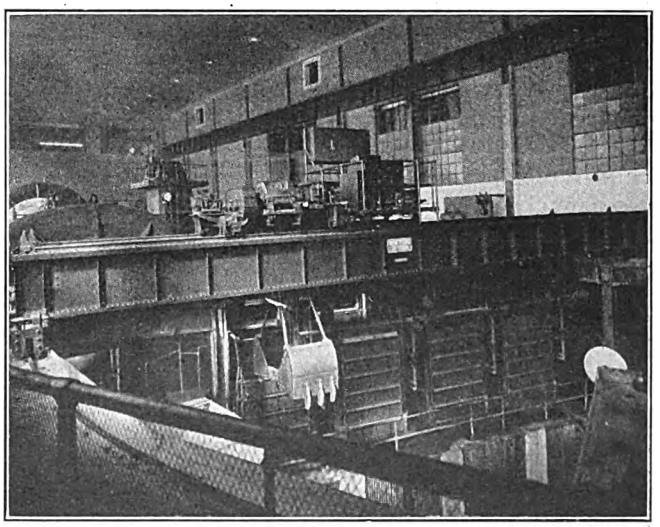
When the shaft is rotated, the driving member will run along the inclined face of the template, pressing at the same time the polished tracer roller against the polished face of the groove. The driving member and tracing roller are thus kept in constant engagement with their respective template faces, which insures uniform speed. The speed can be regulated either electrically by a rheostat or mechanically by changing the position on a friction wheel on a friction disk or by both.

Among the advantages claimed for the mechanical drive are that all possible irregularities and vibrations of the driving member are up and down and cannot affect the smooth running of the tracer and the machine, which operates in another plane and is guided by a polished tracer, pressed on a polished face. A smooth and uniform movement is thus obtained which enables the cutting torch to produce smooth and accurate cuts. The equipment is being furnished in two standard sizes with cutting ranges of 12 in. x 12 in. and 24 in. x 24 in.

Unique Application of Electric Traveling Crane

A RATHER unusual application of a traveling crane as a labor-saving device is used at the power plant of the Union Gas & Electric Company of Cincinnati, Ohio, which furnishes power to the South Covington & Cincinnati Street Railway Company. This crane serves as a dredge for an intake well of river water for cooling turbo-generator condensers. Water is supplied from the Ohio River to the intake well through tunnels, and is first cleared of water-logged débris and silt by means of a heavy bar iron grill. The crane is used in connection with the removing of this débris and silt from the bottom of the well. A grab bucket operated by the crane takes up the refuse and deposits it into a hopper. The grab bucket is often called upon to remove heavy water-logged objects.

The intake well has the shape of a sector of a circle. The crane spans the well radially, having one end truck pivoted at the center of the circle, while the other end travels on a circular track at the outside edge of the well. This truck is fastened directly to the floor at this level, and a pipe railing is provided around the crane and the operating mechanism of the traveling screens as a safety measure. The crane trolley with its suspended bucket travels along the entire length of the crane bridge or as far in toward the center of the circle as efficient operation of the bucket will permit. The operator's cab is fastened to this trolley and extends above the top of the bridge girders in such a manner as to give the operator an unobstructed view.



TRAVELING CRANE USED TO REMOVE REFUSE FROM INTAKE WELL

The installation was made according to specifications issued by Sargent & Lundy of Chicago, and the crane was built by the Whiting Corporation of Harvey, Ill. The span of the crane is 49 ft. 10 in. and the trolley is designed for a lift of 100 ft. of the grab bucket, which is of ¾ cu.yd. capacity. Two motors of 7½ hp. operate the bridge and trolley travel respectively, and two 45-hp. motors operate the bucket hoist.

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Combination Track Grinder and Drill

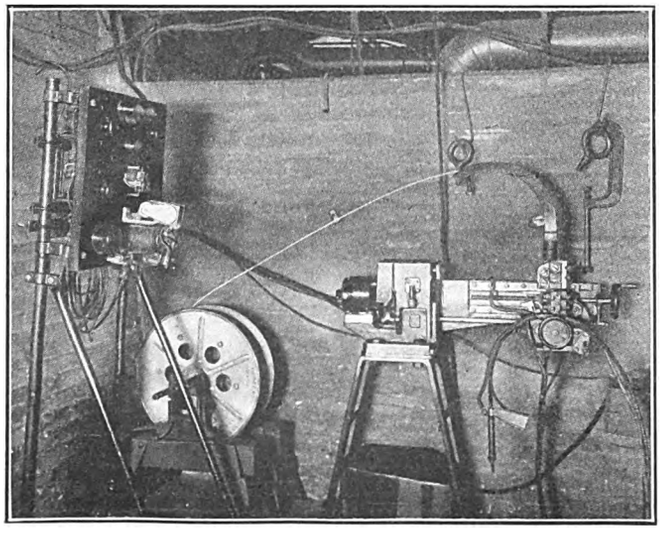
THE accompanying illustration shows a Stow electric railway track grinder in operation in Providence, R. I. The equipment consists of a multispeed motor mounted on a small truck and connected to the grinding wheel by a flexible shaft. This arrangement provides

GRINDING TRACK IN PROVIDENCE R. I.

a grinder which is easily handled and can be used in heavy traffic centers without danger of interfering with traffic. The same equipment can be used for track drilling operations by removing the grinder and substituting a drill attachment. The motors used are compound wound and both dust and moisture proof. The change in speed is accomplished by varying the air gap in the center of the pole while the density is maintained at the pole tip. Motors are furnished in sizes of from ¾ to 3 hp. and with wheels in size 6 in. x 1 in. up to 12 in. x 2 in. This equipment is built by the Stow Manufacturing Company, Inc., Binghamton, N. Y.

Semi-Automatic Arc-Welding Outfit Increases Production

THE Third Avenue Railway, New York City, has recently installed in its Sixty-fifth Street car shop a General Electric semi-automatic electric arc welder shown in the accompanying photograph, which is at the present time being used to build up motor axle bearing housings. While the installation of this machine at the present time is of a temporary nature, the company has been able to increase the production of this class of work 25 per cent over ordinary hand welding. The company hopes to be able to increase its production 50 per cent or more when the apparatus is permanently installed and the operator has become thoroughly familiar with its operation.



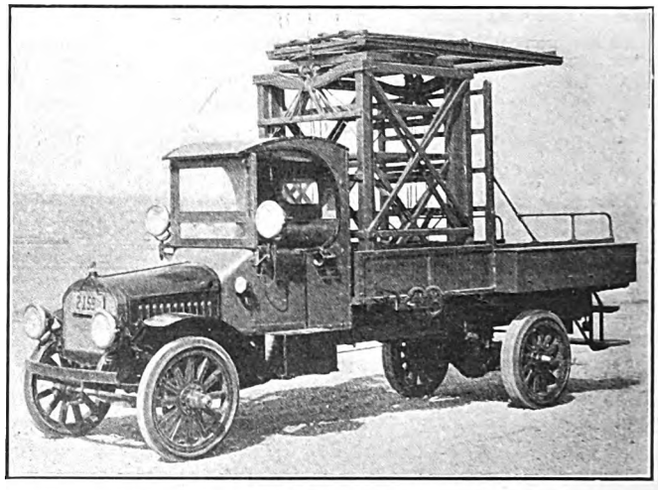
SEMI-AUTOMATIC WELDER IN THIRD AVENUE RAILWAY SHOP

The use of this machine does not require the services of a skilled arc-welding operator as the average mechanic can obtain good results from it after one or two days' operation. The arc length which governs the quality of all electric arc welding is electrically and mechanically controlled and is not subject to the variations of hand welding. This results in a better and more uniform quality of deposited metal. Another advantage with this type of apparatus is that the electrode material is fed continuously from a reel instead of being cut in short lengths as in hand welding, eliminating the necessity of frequent changing of electrodes and the waste of the stub ends.

This apparatus can be used for building up any worn surfaces, welding tanks and almost any arc welding that is now being done by the hand process. This apparatus is also used for welding complicated parts in production work where it is not feasible to use an automatic welder due to the difficulty of providing the necessary jigs and feeding mechanisms required for the automatic machine.

Overhead Tower Truck Used in Little Rock

THE Little Rock Railway & Electric Company uses a two-ton Mack truck with a Trenton three-section tower in connection with its overhead maintenance repairs. The truck has a 162-in. wheelbase and the wheels are equipped with solid tires. The Trenton tower is



THREE-SECTION TOWER TRUCK IN LITTLE ROCK

12 ft. 2 in. from the ground to the platform in its down position and 18 ft. 4 in. when raised. The space inside the body is used for carrying wire, tools, etc., and a special wire rack is constructed at the back of the tower, which uses S hooks to hold the coils of wire.

Tool boxes are provided on each side and these are constructed so that the sides fold down and act as a shelf for use while repairs are being made. Searchlamps are installed at the front and are mounted on a double hinge, so that they can be directed in any direction. A box is provided inside the driver's cab for a 30-ft. extension cord, which can be plugged in on the dash to provide light at the point where work is being done at night. A complete electric starting and lighting system is installed as part of the chassis equipment.

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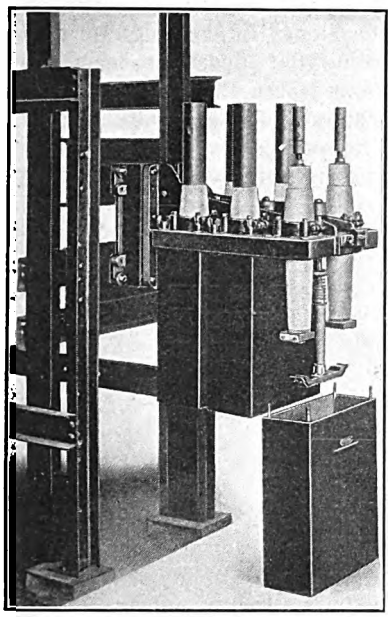
Quick Break Oil Circuit Breaker



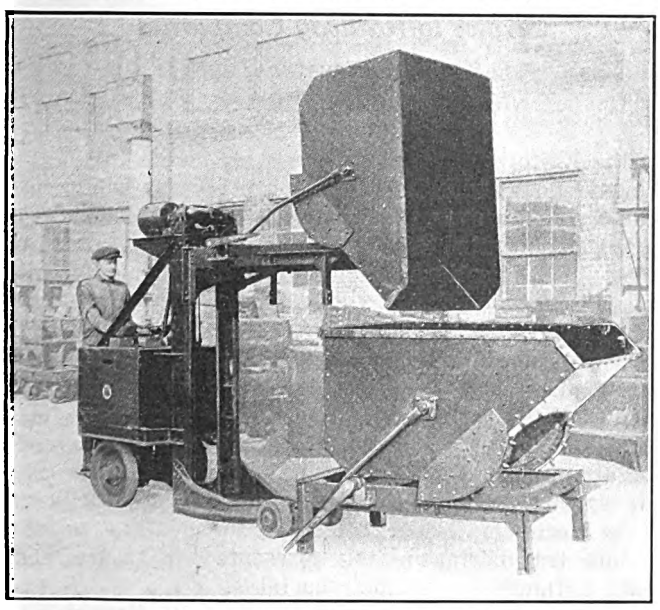
NEW TYPE OF CIRCUIT BREAKER

THE Condit Electrical Manufacturing Company has just brought out the type D-22 oil circuit breaker. This incorporates some of the principles used in its present type D-12. These include a strong tank rigidly supported at four points on the frame and a rigid frame construction to insure contact alignment. High-speed operation is obtained from a steel mechanism assisted by accelerating springs placed on each brush rod. Standard arcing tips are used on both stationary and movable contacts. The type D-22 oil circuit breaker is furnished for either hand or electrical operation in sizes up to and including 1,200 amp. for 15,000-volt service.

New End Dump Skid for Use with Platform Trucks

TO FACILITATE the handling by an elevating platform truck of such materials as ashes, coal, sand, gravel and the like, the Lakewood Engineering Company, Cleveland, Ohio, is marketing an end-dumping body skid, with steel framework and steel legs. It also has a similar side-dumping skid. These are particularly useful for loading bulk materials and transporting to bins, motor truck bodies, cars, storage piles and the like.

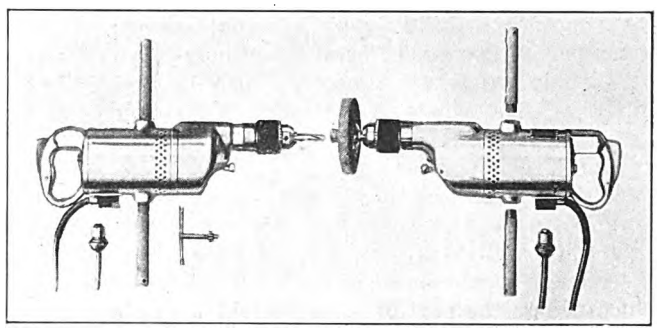
The skids may be set down anywhere in the shops or yards for loading and when filled a platform lift truck can pick up the skid and transport it to the desired point. The dumping is controlled by levers on either side of the body. The studded rocker and holes in the rocker race insure accurate alignment. The capacity of the end dump body is 27 cu.ft. and is limited to 100 lb. per cu.ft. The level capacity of the side dump is 18 cu.ft. The weight of load is limited to 3,000 lb.



PICK UP AND DUMP POSITION OF BODY SKID

Combination Electric Drill and Grinder

A NEW tool for use in shops where hand drilling and grinding operations are performed infrequently and where the purchase of separate machines is not warranted has been marketed by the Wodack Electric Tool Corporation, Chicago, Ill. The combination tool has a drilling capacity in steel of from $\frac{1}{8}$ in. to $\frac{5}{8}$ in. holes and when used as a grinder carries a 6-in. x $\frac{3}{4}$-in. grinding wheel. Two separate speeds are provided, the slow speed for drilling and the high speed for grinding. The complete weight of the tool is 18 lb. and the motor develops $\frac{1}{2}$ hp. under load. A switch located in the top handle is a quick make and break automatic stop type, which insures the operator having the tool under control at all times. Aluminum castings and ball bearings are used throughout.



PORTABLE ELECTRIC DRILL AND GRINDER

An Illuminated Station Sign

THE accompanying illustration shows the type of sign adopted by the New York Municipal Railway Corporation for use on the platforms of stations on the elevated structure at which both express and local trains stop and where the platforms are therefore placed between the tracks used by the two classes of service.

ILLUMINATED STATION SIGN

The sign itself is of enameled iron with white lettering placed on a dark blue background and supported by an ornamental iron framework. In order that the sign can be read easily at night it is lighted by incandescent lamps placed with their axes in a horizontal plane and with their wiring in conduit, the lamps being concealed in the hood over the sign. These lamps, when an entire circuit of five is not used, are part of one of the circuits providing general illumination for the platform.

The hood is in the shape of an inverted trough, the sides being lined with white enameled steel which acts as a reflector and throws the light from the lamps down.

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Letters to the Editors

The Rail Research Problem

PUBLIC SERVICE RAILWAY
NEWARK, N. J., March 8, 1922.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for March 4 appears an editorial on the subject of "Applying Some Real Research to the Rail Problem." The importance of this subject with reference to arc-weld joints is sufficient to warrant some further comment, although it is only recently that manufacturers and users of arc-welding equipment have come to a proper realization of the truth of the matter.

Among other things your editorial stated: "Some agency should have been established long ago to try out the various joints and processes on a limited scale on behalf of the whole industry." This suggests an arrangement, however, which, although ideal, will, in my opinion, never be fully realized. While I am a member of the recently formed committee on welded joints, I believe that, although this committee will ultimately accomplish a great deal of good, it is going to be seriously handicapped in its work due to the natural reluctance on the part of some individuals or companies to appropriate any money which would be used either wholly or in part for the investigation of other people's products or practices. They might, however, be willing enough to put up the money if they could be assured that it would all be spent in investigating their own joint problems. But in the operation of such a committee as has just been formed, any money contributed must necessarily go into a general fund to cover all research work, and without this money little that is worth while can be accomplished. Also, because of the size of the committee and the diversity of interests represented, it will necessarily be slow in reaching an agreement and submitting a final report.

The development of joint welding is taking practically the same course as did that of the electric motor twenty-five or thirty years ago. Arc welding has progressed, as your editorial states, only because a few electric railway engineers had the courage of their convictions and did not let failures in the early stages of their experiments discourage them from making further attempts. If some of the companies which did most of the waiting and "heavy looking on" in the earlier days had joined in the experimental work, the rail-joint-welding art would be further advanced than it is.

Manufacturers of arc-welding equipment have recently come to realize that, if they are to continue long in the business, they must obtain a more definite knowledge about what takes place under the action of the arc and how to control this action. An accurate knowledge of this is probably of more vital importance than the manufacture of the machine for producing the arc, if the welding process for rail joints is to endure. In the case of the seam arc weld, experiments would seem to indicate that certain physical characteristics in the resultant metal in the seam are essential if satisfactory results are to be expected. At least one company manufacturing arc-welding equipment is spending considerable money in making elaborate laboratory tests and analyses of welded joints, working in co-operation with electric railway engineers using their product, in an effort at self-education on the subject. The experiments in question have already developed interesting and valuable data which have somewhat upset at least one previously accepted theory as to the effect of the carbon electrode on the carbon content of the resultant metal in the seam. Although represented on the committee on welded joints, the company referred to has for its own protection been obliged to go ahead with its own experimental research work, since it could not afford to sit quietly by and await the results of the work of the committee, which will necessarily be slow.

HOWARD H. GEORGE,
Engineer of Maintenance of Way.

Virtue in the Hole of the Doughnut

PLYMOUTH, MASS., Feb. 23, 1922.

To the Editors:

I am a New Englander from one of the oldest sections and am therefore qualified to speak on the question of doughnuts. I agree with you in your editorial in the issue of Feb. 11, that considering the misnomers applied to the delectable delicatessen which we, in this section of the country, dip in our morning coffee, it is dangerous to use them as subjects for comparison. But a doughnut in New England is in reality just what you use to build upon in your article. Its outline is formed by two concentric circles, one full of air and aroma and the other full of solid satisfaction.

In boom or depression we look at the hole as well as the doughnut, for without the hole the result would be a heavy, soggy doughnut such as one buys full of poor jelly in New York.

In boom times the hole represents the unemployed. In times of depression the doughnut represents wholesome unrest, and unrest means a getting back to normal times again. A doughnut sinks when it is first put in the kettle, but bobs up serenely as it becomes edible, so if the electric railways and manufacturers who sell service and supplies will watch the doughnut as it rises they will have no ground for pessimism.

JOHN RUSSELL, JR.

"Bus Transportation" Renders Valuable Service to Railway Companies

STONE & WEBSTER, INC.
Management Division

BOSTON, MASS., Feb. 25, 1922.

To the Editors:

I have noted with interest the controversy which has been going on over the propriety of your magazine's having inaugurated the publication of BUS TRANSPORTATION. The objections seem to boil down to a feeling that this move on the part of your magazine is disloyal to the electric railway industry. The thought that impresses me most with regard to the publication by you of "BUS TRANSPORTATION" is that it presents the subject from the point of view of the electric railway companies. The other magazines in the interests of bus transportation are published by parties antagonistic to the electric railway, and it seems to me, therefore, a decided boon to the electric railways themselves to have the subject of bus transportation ably presented by a concern which is familiar with their business.

C. W. KELLOGG.

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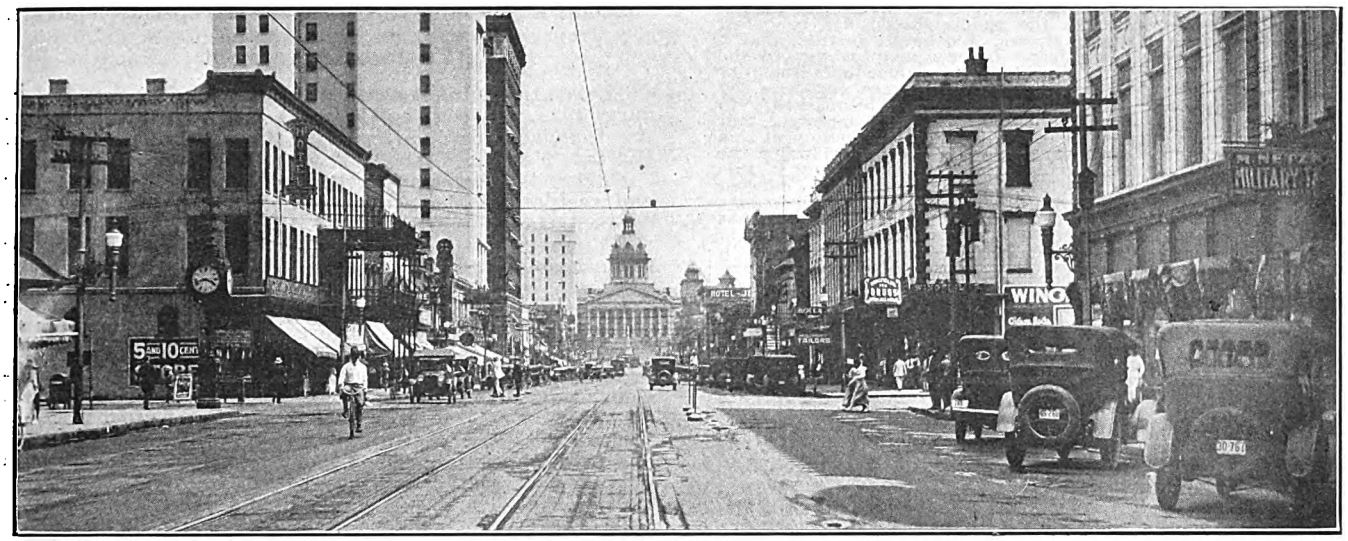
Columbia, Carolina Capital City, Completely Carless

Strike Occurred Over Question of Right to Discharge—Resumption Delayed Because of City Ordinance—Compulsory Arbitration Act Passed by Legislature, but Company Applies for Injunction on Ground of Unconstitutionality—Public Opinion Favorable to Company



MAIN STREET, COLUMBIA, S. C., WITH STATE CAPITOL AT END OF STREET

THE City of Columbia, S. C., has had no electric railway service since Feb. 15. On the evening before the men decided to send the unwelcome valentine to the citizens of Columbia and to the company that they had decided to leave its service, which they did forthwith. Since that time the company has been unable to operate any cars because of an ordinance passed by the city in November, 1917, forbidding the employment of any motorman or conductor within the city unless he had received instruction on the cars in Columbia for the fifteen days immediately preceding the time of assuming his duties, the instruction to have been given by a motorman or conductor who had been actively employed in such capacity in Columbia for the six months immediately preceding. The penalty for the violation of this ordinance is a fine of not less than $50 or more than $100 or imprisonment of not less than ten or more than thirty days for each and every violation. In these circumstances the company had no option but to stop service.

Columbia is the center of a rich agricultural district as well as being the state capital and an important railroad center, the Southern Railroad, the Sea Board Air Line and the Atlantic Coast Line all entering the city. It has a population of about 50,000 and its railway system serves a population of about 10,000 more people. The Columbia Railway, Gas & Electric Company, which operates the railway system within the city, has about 55 miles of track, 53 motor passenger cars and 12 trail cars and is owned largely in Columbia. It has some suburban extensions, the longest being to Camp Jackson, 6 miles away. This extension was built during the war when the camp was used by the government for training recruits for the army. It now has only a small army post. The other main extensions of the railway are that to Ridgewood, 3 miles, and that to Olympia, 2 miles. The fare for some time has been 7 cents with 3 cents for a transfer within the city. All of the extensions are within the single-fare zone except that to Camp Jackson, and on that line there are two zones of 7 cents each. All cars have been operated by two men because of a city ordinance passed a number of years ago declaring: "It shall be unlawful for any electric street car to be run in the streets of Columbia unless the same is in charge of a conductor."

COMPANY EXPLAINS SITUATION TO PUBLIC

Operated under the conditions which existed in 1921 the railway has not been able to pay even operating expenses, and last November the company thought it wise to explain the situation as it existed to the public. In consequence it published the following notice in the daily papers under date of Nov. 12:

COLUMBIA RAILWAY, GAS AND ELECTRIC CO.
F. H. KNOX, *President*
COLUMBIA, S. C.
November 12, 1921

The Street Railway Problem in Columbia

TO THE CITIZENS OF COLUMBIA AND VICINITY:

During the years that the street railway has been operated in Columbia, it has been the aim of those in charge to give good service and to keep the service in advance of the growth of the community. Every citizen of Columbia is interested, directly or indirectly, in having adequate and efficient street car transportation in Columbia and vicinity. Many people have no other means of transportation. The suspension of street car service would hurt nearly every business interest in the city, and some kinds of business seriously.

We are submitting the following statement of earnings and expenses in the street railway department for the first ten months of 1921:

Earnings street railway, all sources, ten months in 1921	$375,761.97
Operating expenses, including taxes	467,716.43
Deficit	$91,954.46

The above statement shows that the earnings of the street railway for the first ten months of this year are not enough by $91,954.46 to pay the bare operating expenses and taxes. In other words the company is sustaining a direct loss of more than $9,000 per month, besides the actual loss to the

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investors in the property, by reason of the failure of the street railway department to earn any money with which to pay the interest on the large amount of capital invested in this department. Every effort has been made to reduce operating expenses and to operate the system as economically as possible, but we are still confronted with this large deficit. We have about reached the point where we cannot continue indefinitely the operation of the street railway system at such an actual loss.

Two ways naturally suggest themselves, by which the situation might be remedied to some extent. The first is, by raising the present rates of fare and, thereby, to increase the earnings. The company is of the opinion, however, that the present fare is as high as it should be, both for the interest of the company and for the interest of the people. It believes that the people should not be called upon to pay a higher fare, and it believes, further, that a higher fare would not bring in any more money to the company. The second remedy is to reduce operating expenses by reducing the wages of employees and, also, by reducing service. We believe that it will be necessary to make some reduction in the wages of our employees, but we think that this should not be a drastic reduction at this time, in fairness to them. We are also considering the reduction of service, and can effect some economy in this way, but we believe that the saving that might be effected by either one of these methods will not substantially reduce operating expenses. In other words, after we do all that can be done along these lines we believe that there will still be a very large deficit in receipts as compared with operating expenses, and so large that the company cannot stand these losses much longer.

The company desires to state to all parties interested that this problem has become acute. Whether or not some plan can be devised whereby it can be made possible to continue to operate a street car system in Columbia is fully as important a question to the people of Columbia as it is to any stockholder in the company—perhaps more important. We have always felt that we had the confidence of the substantial business people of the community, and it is their interest and the interest of the people who use the cars, as well as our own, which we seek to protect, and it is their advice and counsel we ask in helping us to solve this serious and perplexing problem.

Respectfully submitted,
COLUMBIA RAILWAY, GAS & ELECTRIC COMPANY.

CITIZENS ASKED TO GIVE MATTER THOUGHT

In commenting on the situation at that time F. H. Knox, president of the company, said, in part:

"The Columbia street car system is facing a crisis, a crisis which is causing the men connected with it deep concern. Our problems are the problems of the city of Columbia, and we are, in all sincerity, asking the citizens of Columbia for advice and for counsel in devising a plan whereby we can continue to operate the street cars.

"It is needless for me to stress the importance to a growing city of an adequate street car system. All persons who have given the matter any consideration know what a good street car system means in the growth and prosperity of a city, and we are as anxious to maintain a good system as are any of the people of this community. But a deficit of approximately $91,000 in ten months operation is no light matter. How can we continue to operate the street cars under such conditions is the question before us, and it is a question that is of interest and importance to hundreds of citizens."

In speaking of the advertisements Mr. Knox said: "The company has no ulterior motive—we are facing a serious situation, and this situation may affect hundreds of citizens who depend on the street cars for transportation from place to place.

"We doubt the wisdom of increasing fares to 10 cents, and are not sure that such a step would increase our revenues. To replace our two-man cars with the 'one-man' or 'safety' car would involve a heavy expenditure and at that might not relieve the situation.

"To reduce the wages of our employees might bring some relief, but the company hopes to be able to avoid any drastic reductions. It is seen at once that the problem is not one easy of solution, and we hope the thinking people of Columbia will give the matter due consideration."

SLIGHT REDUCTION MADE IN WAGES

During 1921 the company had an agreement as to wages and working conditions with its employees who are members of local division 590 of the Amalgamated Association. This contract expired on Dec. 31, 1921, and in its renewal the company sought some relief from the high-rate war wages which it had been paying and also better conditions as to assignment of runs and discipline, particularly in regard to the right to suspend or discharge any men when such action seemed to its officers necessary. In consequence it submitted the following agreement to the men as the best that it could make for 1922 and at the same time continue the operation of cars.

Proposed Agreement

"*Memorandum of Agreement* made this first day of January, 1922, between the Columbia Railway, Gas and Electric Company, hereinafter called the Company, and Local Division Number 590.

Section 1—The company agrees that the following rules and regulations shall be applicable to all motormen and conductors.

Section 2—The company will not discriminate for or against any employee by reason of his affiliation or non-affiliation with any labor organization; nor will it attempt to coerce or influence any employee against or in favor of becoming a member of such organization.

Section 3—The runs shall be arranged so that they will be as nearly nine hours long as practicable. In the assignment of runs, the company reserves the right to place men on such runs as in its judgment they are best fitted for.

Section 4—The company reserves the right to suspend and to discharge any motorman or conductor whenever in its judgment such action may be necessary.

Section 5—The wage scale on and after Jan. 1, 1922, until Jan. 1, 1923, shall be as follows: First three months, 41 cents per hour; second three months, 44½ cents per hour; six months and over, 48 cents per hour.

Section 6—This agreement to be in full force and effect Jan. 1, 1922, to Jan. 1, 1923; provided, that if the company shall cease to operate the street railway this agreement shall be at an end."

This contract proposed a reduction of approximately 10 per cent in the wages of the men but made substantial changes in certain other features of the previous contract.

DISCHARGES AND SENIORITY THE ISSUE

In reply under date of Dec. 24 the employees accepted the wage scale as well as Section 2 and insisted on "the right of seniority and arbitration" and suggested that this matter be left to arbitration. To this the company replied by letter as follows:

We note that you accept the wage-scale specified in the agreement submitted to you. We note, further, that you accept Section 2 in the agreement, in which the company recognizes the right of any employee to affiliate with any labor organization, or not to affiliate as he may think proper. The agreement also provides that the runs shall be as nearly nine hours long as practicable, this being the length of runs now in effect.

In any agreement between an operating company and its employees the essential provisions, which admit to exact definition, are the wage scale and the hours of work. It is the policy of this company to give every man a square deal and, wherever we can, to reward faithful and long service. Just what is a square deal cannot be defined in any agreement, as it is a very broad term. It touches every association and should be the controlling rule of all the men working for the company, whatever their position or work may be, in their relations one with another. We can say this, however, to every man working for the company who is honest, conscientious and efficient to the best of his ability in the performance of his duties, that he need have no fear of losing his job as long as the company can find any employment for him. The agreement submitted to you contains the best and fairest terms we have to offer.

We note, further, in your letter that you say you must insist on the right of seniority and arbitration. The street railway situation in Columbia has reached a critical stage, so critical that we may find it necessary to discontinue operations. In view of the seriousness of the situation we

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cannot agree to submit to arbitration the question of whom we shall employ or discharge, or the work to which we shall assign our employees. In other words, if we are to continue operations we insist upon directing the affairs of the street railway to the best advantage. You may consider the position of this company final on these points.

During January and the first part of February, 1922, there was no change in the financial condition of the company. The figures for the year 1921 showed that the street railway department failed by $119,758 to earn operating expenses and taxes, and during January, 1922, the deficit on the same basis amounted to $11,886.

Finally, on Feb. 14, the company dispensed with the services of twenty-one conductors for adequate cause. This left 108 conductors and motormen in the service of the company. These men immediately struck. The company promptly published the facts in the daily papers in regard to the dispute, including the correspondence between the company and the union.

Compulsory Arbitration Ordered

The issue was thus clearly drawn, *i.e.*, the right of the company to discharge men and assign runs. These points it considered it could not arbitrate in the interests of discipline and it declined to enter into any arbitration on these points.

While the cars were standing still, a bill was introduced and passed by the state legislature requiring compulsory arbitration between street railways in the state and their employees at the request of either party. This bill, whose application was limited to street railways in cities with a population of between 30,000 and 50,000, and thus covered Columbia only, declared that the board of arbitration for such disputes should consist of a representative from each side and a third to be chosen by them. If they could not agree the mayor of the city in which the railway company is located is to act as the third arbitrator, and if either party after five days notice fails to appoint its representative he shall be named by the judge of the court of common pleas resident in the circuit. The decision of this board according to the act is declared to be final except on questions of law and on these appeal may be had to the state courts. This bill was ratified by the governor on Feb. 24.

To those to whom the passage of such an act by a state legislature may appear surprising it might be said that as recently as March 10, 1922, the Senate of South Carolina voted to attach a proviso to the act appropriating funds for the public school system, withholding financial support from all institutions of learning supported by the State "teaching, or permitting to be taught, as a creed to be followed, the cult known as Darwinism." Such institutions are permitted to explain what this cult is, just as they may tell the students about the legends in ancient Greek mythology, but they are not to teach the principle of natural selection and the survival of the fittest as a law of nature.

Another act of the South Carolina legislature, passed in 1915 and still on the statute books, forbids employees of "hotels, restaurants, cafés, railroad companies, sleeping car companies and barber shops" from receiving "gratuities or tips." This act, according to law, is posted in all hotels, restaurants, railroad stations and barber shops, and all persons are warned not only against the receiving but the giving of tips.

Following the passage of the arbitration act and its approval by the governor on Feb. 24, the Columbia Railway, Gas & Electric Company lost no time in applying for an injunction in the South Carolina State Supreme Court to restrain any action taken under the compulsory arbitration act on the ground that it is unconstitutional. Briefly, the reasons for this contention were that the statute was discriminatory, first because it applied to only one of five electric railway companies in the state and second because it differentiated electric railway companies from other corporations. The company's plea also declared that the act violated the free-

To Our Street Car Patrons

The company is greatly concerned over the possibility that any of its patrons should think that it is unreasonable in its position with reference to the strike.

The company is willing and anxious to resume service as soon as it can do so under circumstances and conditions that offer any possibility of successful permanent operation.

It is impossible for us to operate the street cars unless we can have the right to select our motormen and conductors, the right to specify their work and the right to discharge them without arbitration. Any effort to operate under a contract, taking these rights away from us, will necessarily result in failure within a very short time. The company feels that in standing out for these rights it is not only seeking to promote its own interests, but is also seeking to promote the interests of its patrons and the public, because any effort to operate otherwise is certain to result in failure and very probably cause the permanent abandonment of the street car system in a very short time.

The company is advised by its attorney that the arbitration act is unconstitutional and proposes to immediately test it in the courts. If the company arbitrates under that act it runs the risk of having an award imposed upon it under which it can not possibly operate successfully.

We sincerely believe that in standing out for what we consider to be our rights and for what is necessary to the successful, permanent operation of the street cars here, we are doing the right thing for ourselves and for those using the street cars.

An ordinance, adopted by city council in 1917, forbids under heavy penalty any person from acting as motorman or conductor who has not had fifteen days' instruction in this city by another motorman or conductor of six months' experience. This ordinance makes it impossible for us to secure any motormen or conductors.

Respectfully submitted,

Columbia Railway, Gas & Electric Co.

By F. H. Knox, President.

February 27, 1922.

To the Motormen and Conductors Formerly in the Employ of the Columbia Railway, Gas & Electric Company

The Columbia Railway, Gas & Electric Company is anxious to resume operation of its street cars. It will reinstate the motormen and conductors leaving its service on February 15, at the same rate of pay that they were drawing on that date, and with their seniority rights as of that date, in so far as it is possible for the Company to recognize them.

The Company will make no discrimination between union and non-union men, and there will be no discrimination against any former employee because he left the service on February 15.

The rate of pay for this year is as follows:

First 3 months, 41c per hour.
Next 3 months, 44½c per hour.
Six months and over, 48c per hour.

As stated above, former employees will be reinstated at the rate of pay they were drawing on February 15.

The Company reserves the right to discharge employees.

Columbia Railway, Gas & Electric Company

By F. H. Knox, President.

March 2, 1922.

Two Advertisements in Which the Company Explains Its Position

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dom of contract in that it allows a third person to fix the terms of an employment contract. A decision of the court on this plea for injunction is expected within a very few days.

RAILROAD COMMISSION WILL ACT

During the present session also the legislature has increased the Board of Railroad Commissioners from three to seven members. Previously these members have been elected directly by the voters. The last named members were elected by the legislature. The attorney-general is said to have given the opinion that the newly constituted commission has authority to regulate the service of the street railway company, but nothing has yet been done by the commission as it has only just been organized.

THE PUBLIC TRAVELS BY AUTO

As a substitute for trolley service since Feb. 15, the public has been forced to walking and riding in automobiles. The number of autos in and around Columbia is very large, the streets are wide and the pavements are fairly good. Moreover, the main business street of the city, called Main Street, is a very wide thoroughfare with ample accommodation for parking. A view of Main Street with the State Capitol in the distance is given at the heading of this article. Not a large number of jitneys have put in an appearance, but owners of autos have been very liberal in "giving a lift" to their friends and even to strangers. In addition, some of the large employers of labor, like the cotton factories, carry their employees in standing loads between the center of town and their places of work on trucks.

There has been one attempt to conduct a mass indignation meeting against the company, but the general sentiment about this and the action of the legislature can be gaged by the following, which is part of an editorial in the Columbia *Record* of March 10:

We have entered on the fourth week of the street car strike in Columbia. The prospect of a settlement of it seems to be as remote as ever it was. What are we going to do about it?

The mass meeting at the court house on Monday night was manifestly "staged." A casual inspection of the names of the speakers, and a little knowledge with regard to their relations to our general business situation and to politics, is all that is necessary to enable an observer to reach this conclusion. The meeting was nothing more than a gesture. The foregathering of union leaders, union men, politicians in office, politicians seeking for office, and attorneys affiliated to the carmen's union and to former litigation against the company, is not convincing as a manifestation of public indignation against the company.

The effort to create public opinion in favor of the carmen who struck without notice because the company discharged some members of the union does not strike us as an intelligent effort to settle the strike in the present and ultimate interest of Columbia and its public utilities.

Other gestures have emanated from the politicians in the General Assembly. They are equally futile, as we view the situation. The public utilities in Columbia have long been the football of small politicians and small candidates for public office. The issues involved cannot be settled by such as these, who fatten on prejudice and truckle wherever a vote is in prospect.

But there must be a settlement of the problem, somehow and sometime soon. It occurs to us that the matter is of sufficient consequence for the really and vitally interested business men of the city, who have a stake in the community and work for a living, instead of eternally "politicking," to seriously investigate, impartially, with an eye to the future, and in calmness of judgment, in order to ascertain if something can be done. We believe that most people are growing weary of political gestures.

Executive Board of Federated Engineering Societies Meets in Chicago

WITH President M. E. Cooley, dean of the colleges of engineering and architecture, University of Michigan, presiding, the executive board of the American Engineering Council, Federated American Engineering Societies, met in Chicago on March 10. The board spent the day in giving consideration to a host of subjects which came up for attention, and was entertained in the evening by the University of Michigan Engineers' Club of Chicago with President Marion LeRay Burton of the university and Dean Cooley as the principal speakers. Dean Cooley gave expression to some of the ideals and purposes of the Federated Societies. He spoke of how little the engineer is known in the mind of the general public and said that the ambition of the Federated Societies movement is to put the engineer up in his proper place in public esteem and give him the opportunity to play the part in public affairs for which he is needed. He pointed out that the present organization comprises twenty-eight societies with a membership of approximately 50,000 and that when all societies which are entitled to membership have taken it, there is a prospective membership of from 175,000 to 250,000 engineers. When the engineers are brought into their own in public affairs through this organization, the dean predicted that legislation would be handled on a broader basis with less evidence of selfish interests and compromise.

Speaking of the accomplishments of the Federated Societies, Dean Cooley mentioned the investigation to eliminate industrial waste as the greatest. Another important thing was the work done in bringing about the passage of the bill by Congress which will authorize a reorganization of the U. S. Patent Office. Perhaps of greatest interest was his statement of the kind of things which the Federated Societies can undertake. Among these was a study of the transportation systems. He pointed out that the present average mileage of a freight car is 24 miles in a day. If a study should bring out how it might be possible to increase this even to 50 miles per day, he said that the saving in equipment and in train crews alone, would be enough to pay a return on the entire railroad investment. It was his opinion that the engineers should make such a study, for it is the engineer who has built the railroads, who is operating them, and who knows what the costs are, and yet he has taken no part in the great transportation problems as they have been before the public.

Dean Cooley expressed the thought that the public does not want the opinion of individual engineers in such great matters of public concern; what it does want is the opinion of the engineering profession. The public, the utilities commissions and the courts refuse to take the word of anyone, and this merely points again to the great need for the expression of profession-wide advice which may be accepted as being free from selfish interest and inspired only by the desire to serve the best interests of all.

Other things mentioned as the kind that can be undertaken by the Federated Societies, by the dean, were foreign trade development and what to do about the forests and reforestation.

ACTION TAKEN BY EXECUTIVE BOARD

In its meeting during the day the executive board of the Council discussed in some detail the aspect of the proposal to form a world-wide engineering organization and a committee was authorized to consider the various phases of the whole question including such constitutional changes as would be necessary. The Sterling bill for reclassification of engineers was indorsed rather than the Lehlbach bill, since the salary schedules of the former were

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approximately 10 per cent higher than in the latter and conform more nearly with the report of the original reclassification committee.

The subject of employment service, which the committee on that subject believed should be turned back to the jurisdiction of the constituent societies, was permitted to remain in status quo and a new committee was authorized to bring in a new report. The proposal that the societies should publish a bulletin was laid on the table and later revived and a committee asked to bring in information on proposals made to handle a bulletin by a private publisher. Other subjects laid on the table were the proposals to take a part in the Muscle Shoals project, the utilitarian use of national parks, tariffs on technical books, the Great Lakes-St. Lawrence Waterway, and the International Engineering Congress in Rio de Janeiro. The recommendations of the conference on paving brick standardization were approved.

Canadian Association Will Convene at Quebec

PREPARATIONS are in full swing for the annual convention of the Canadian Electric Railway Association, which will be held at Quebec, June 1 to 3. In connection with the meeting there will be an exhibit of electric railway supplies. The Drill Hall, a five-minute walk from the Chateau Frontenac, will be used for the meeting and exhibit. The hall provides space for from twenty-five to thirty exhibits.

On March 14, R. M. Reade, superintendent city division Quebec Railway, Light & Power Company, chairman of the committee on exhibits, sent to all associate members the details of the exhibit plans. He sent a chart of the Drill Hall, showing the spaces available and the allotments to all associate members. The space is donated, and Mr. Reade's committee will do everything in its power to facilitate the preparation of exhibits. Power will be supplied to exhibitors desiring to have an operating exhibit.

Annual Banquet of New England Club

THE twenty-second annual banquet of the New England Street Railway Club will be the occasion of several notable addresses. The speakers will be Hon. Channing H. Cox, Governor of Massachusetts; Hon. James M. Curley, Mayor of Boston; Hon. William D. Riter, Assistant United States Attorney-General, and Gen. Guy H. Tripp, chairman of the board of directors, Westinghouse Electric & Manufacturing Company. The toastmaster will be Hon. Samuel L. Powers.

The banquet will be held at the Copley Plaza Hotel on Thursday, March 23, at 6:30 p.m., preceded by a reception at 6 o'clock. On Thursday afternoon at 3 o'clock the annual meeting for the election of officers will be held.

Government and Industry Cooperate in Standardization

AT THE request of Hon. Herbert C. Hoover, Secretary of Commerce, the American Engineering Standards Committee has designated A. A. Stevenson, the retiring chairman of the committee as a special representative to work with the department in the operation between the department's Division of Simplified Practice and the American Engineering Standards Committee.

The Division of Simplified Practice is a co-ordinating unit of the Department of Commerce assisting in those reductions of excessive variety and other simplifications which many industries are undertaking in order to decrease the cost of production and distribution of manufactured articles. The work of the division was organized in the latter part of 1921 and is now actively under way.

Mr. Stevenson, who is a past-president of the American Society for Testing Materials, is vice-president in charge of manufacture of the Standard Steel Works Company, a subsidiary of the Baldwin Locomotive Works.

American Standards "In Process"

A report just issued by the American Engineering Standards Committee states that on Dec. 31, 1921, seventeen standards were definitely before the committee for approval. Those of particular interest to electric railway men were the following:

Standards of American Institute of Electrical Engineers, National Electrical Safety Code, specifications for carbon-steel and alloy-steel forgings; and quenched and tempered carbon-steel and alloy-steel axles, etc., safety code for the use, care and protection of abrasive wheels. Since the report was prepared the abrasive wheel code has been approved as explained below.

Safety Code for Abrasive Wheels

THE American Engineering Standards Committee has approved as "Tentative American Standard" a safety code for abrasive wheels. This was prepared under the joint sponsorship of the Grinding Wheel Manufacturers Association of the United States and Canada and the International Association of Industrial Accident Boards and Commissions. The code contains rules and specifications for the operation of wheels operating at speeds in excess of 2,000 surface feet per minute. Copies may be secured at a nominal price from the committee, 29 West Thirty-ninth Street, New York, N. Y.

American Association News

Bus Operation Discussed from Transportation Angle

A MEETING of the T. & T. Association committee on trackless transportation, which is co-operating with the American Association committee on the same subject, was held in Baltimore, Md., on March 15. Viewing the subject from the transportation angle the committee held that the bus could function economically under certain conditions. To establish the limiting conditions the committee plans to submit as a part of its report a comprehensive analysis showing under what traffic conditions and operating costs the motor bus, the trolley bus and rail operation can function to the best advantage, each as a co-ordinated part of a complete urban or interurban transportation system.

The committee also undertook to skeletonize its report for the purpose of analysis and to bring out constructive discussion for its next meeting, scheduled to be held on March 30 in Baltimore.

Those present at the meeting were C. D. Porter, Newport News, chairman; J. L. Adams, Philadelphia & Western Traction Company; W. E. Martin and L. H. Palmer, Baltimore; and H. B. Flowers, Baltimore, chairman of the American Association trackless transportation committee.

Association Bulletins for February

THE following reports were prepared by the bureau of information and service during February:

State Regulation of Motor Vehicles, containing copies of all state legislation affecting the operation of motor vehicles as common carriers.

A Compilation of Cities in which Fares Were Changed. This information is as of March 1, 1922, and shows the city, population, operating company, cash fare, ticket rates, etc.

Employees' Welfare Plans. This is a report made to the New York Transit Commission covering benefit systems, social and recreational activities, individual and group rewards, profit sharing and employee representation in the management of electric railways.

Pole Statistics, showing, for a group of the larger companies the number and types of poles in use and the annual renewals and additions from 1917 to 1921.

Maintenance Costs of Company Automobiles and Line Trucks. Gives detailed figures for month of October and the ten months ending Oct. 31, 1921, of two electric railways.

Working Conditions of Trainmen. This is a supplement to last month's compilation of the same name and gives data for fifty additional companies.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

People Will Decide

Stockholders of the D. U. R. Unanimously Vote for Sale of Property to City—Final Step Reached Before Election

At the stockholders' meeting of the Detroit United Railway on March 11 the contract entered into by the company's directors providing for the sale of the Detroit city system to the city was ratified by a unanimous vote. This act paves the way for a vote on unified municipal ownership of street railways in Detroit and a special election will be formally called for April 17 to vote on the purchase plan.

THE company agreed to sell for $19,850,000, its entire system including lines, cars, carhouses and real estate located in Detroit, Highland Park and Hamtramck, with the exception of about 15 acres of its 46-acre property in Highland Park, 12 acres at Mackinaw Avenue, on Grand River Avenue and the Interurban building at Jefferson Avenue and Bates Street, Detroit.

Bond Issue Will Be Put Before People

At the special election the voters will also be asked to vote a bond issue of $4,000,000, out of which the company is to receive a down payment of $2,770,000. The balance of the bond issue will go to meet expenses incidental to taking over the lines, as an operating fund, and for the purchase of material now on hand from the company. The increase in the bond issue over what was originally thought necessary was deemed essential by the street railway commission to allow the entire system to start efficient operation. If the purchase plan is approved by 60 per cent of the voters the lines will be taken over on or about May 17.

In addition to the down payment, the agreement provides that the city shall pay $500,000 semi-annually until Dec. 1, 1932, when the balance is to be paid in a final payment. Interest at the rate of 6 per cent per year is provided for on all deferred payments.

If the people vote for the purchase of the company's lines the thirty-year war between the city and the company will be ended. Along with approximately 300 miles of track the city will acquire 592 double-truck cars, 196 large trailers and 369 smaller cars.

Mayor Couzens expressed his satisfaction with the proposed terms of sale, believing that the lines can be made to pay their own way, meeting the semi-annual payments and paying all interest on indebtedness. Eventually, he believes, the lines will show a surplus and the sinking fund and interest charges on the $15,000,000 bond issue voted in 1920 for the construction of a municipal system will be met.

The property which the company is willing to sell for $19,850,000 does not include all that was included in the $31,500,000 purchase plan that was voted down in 1919. Since that time the city has acquired approximately 30 miles of the company's tracks and 128 cars taken over at a price of approximately $2,400,000. The cars have been in use since they were acquired in maintaining joint operation over company lines. The following outstanding features are embodied in the agreement.

The city of Detroit, subject to a three-fifths vote of the electors, agrees to buy from the company all the street railways, street railway property (including franchises and other rights) and real estate, together with all overhead and underground wires and appurtenances except panels and feeders for the company's interurban system. It is to pay in cash on or about May 15, 1922, $2,770,000 and $9,500,000 in nineteen semi-annual installments of $500,000 each on the first day of December and June, commencing Dec. 1, 1922, and including Dec. 1, 1931. On Dec. 31, 1931, the balance of $7,580,000 is to be paid in cash. Interest is to be paid quarterly on unpaid portions at 6 per cent per annum. The city reserves the right to increase the semi-annual payments, provided it gives the company thirty days' notice.

The property is to be maintained in good repair at all times until the purchase price is fully paid. The city may abandon or remove certain trackage specified which, by reason of shifting population and the like, becomes useless and unprofitable. The company is to maintain all property in the present state of efficiency and repair until the date of actual delivery to the city of possession of the property to be conveyed. Interurban or suburban service of the company is to be allowed to continue substantially as at present. Passenger cars to use the present interurban station as a starting point. The existing freight terminals are to be continued. Interurban cars are to be operated by the company's own crews subject to city control and regulation.

Steps in Event of Default Explained

The company's permit to use the city lines for its interurban cars may at the option of the Board of Street Railway Commission be suspended or terminated whenever the company is in default of any of the terms of the agreement, if default continues for sixty days after written notice of intention to declare the permit suspended. The city is to have the right to terminate the permit to operate the interurban cars over lines within the corporate limits at the end of any calendar year after two years notice of such intention. Such notice shall consist of a resolution adopted by the Board of Street Railway Commission confirmed by the Common Council.

The city does not agree to become personally liable to pay the balance of the purchase price or the interest thereon. To enforce the payment the company may resort to the courts. No part of any extension or addition to the railway system made by the city is to be subject to the lien of any mortgage made by the company.

Of the initial payment, $2,500,000 and the fifteenth semi-annual payments of $500,000 each are to be deposited in escrow with a trust company, all expenses chargeable to the company. This money so deposited is to be used by the company to purchase or pay outstanding obligations of the company.

In event of default of payment of any installment or interest on the unpaid price or part thereof, the company may apply to a court of equity to obtain a specific performance of the contract, which court may establish and compel the collection of such rate of fare as will provide adequate funds to meet defaulted obligations, and may appoint a receiver of the property, securing the unpaid balance of the contract and grant any further appropriate relief. Or the court may through any lawful agency take possession of the property and operate it at an adequate rate to meet defaulted obligations.

In event of default in payment of the final balance of $7,580,000, the company may foreclose the contract by lawful method and have the right of the appointment of a receiver.

When the property is delivered to the city, the company is simultaneously to deliver any books, records, documents, literature and data needful for use in the management and operation of the property.

All pending suits and actions and alleged causes of action between the parties are to be settled, released and discharged upon the execution of the agreement, and the city is to withdraw all pending complaints and suits for violation of ordinances.

Since the purchase price is less than the amount of existing mortgage liens, the company warrants and defends the city from any action that might result from the excess liability, and this undertaking is to be a lien against the remaining Detroit United Railway assets. The property is to be freed by the company of all debts or obligations and no additional mortgages or liens are to be issued by the company.

The right is given the city to sell separate parts of the property whenever such parts become useless for street railway purposes.

Pending approval by a requisite vote of the electors of Detroit, and the transfer of possession, neither party acquires nor waives any right it may have, if any, to operate cars over the streets of the city. In event of the rejection by the electors, the rights of both parties will remain in all respects as if the agreement had not been entered into.

At the meeting of stockholders and directors, Elliott G. Stevenson, former chief counsel for the Detroit United Railway, was elected acting president and member of the board of directors as well as chairman of the executive committee of the company, replacing Allen F. Edwards.

The office of president will be left vacant until the outcome of the purchase plan is known. Judge Charles Laurandeau, Montreal stockholder, was elected first vice-president and E. J. Burdick, former general manager, was also made a vice-president. A. Avila Gingras was made treasurer, and Joseph Bampton assistant treasurer. J. E. Gill, J. O. Desmarais and M. A. Boivin of Montreal were replaced on the board of directors by E. J. Decary of Montreal, Mr. Stevenson and Mr. Burdick.

Four Cents an Hour Reduction in Reading

A new wage scale affecting employees of the Reading Transit & Light Company, Reading, Pa., went into force on March 1. The new schedule effects a reduction of 4 cents an hour. The new rates in cents per hour are as follows:

First six months	41
Second six months	42
Third six months	43
Fourth six months	44
Fifth six months	45
Thereafter	46

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Court's Aid Sought

Pacific Electric Railway Petitions Court to Make Strike Injunction Order of 1918 Permanent

In the United States District Court at Los Angeles the Pacific Electric Railway on Feb. 28 petitioned to make permanent the temporary restraining order issued by U. S. District Judge Bledsoe on July 2, 1918, against the company's trainmen, who went out on a strike during July, 1918, while the United States was at war.

The action is the Pacific Electric Railway against M. E. Montgomery and J. A. Farquason, organizers of the Brotherhood of Locomotive Engineers and Brotherhood of Railroad Trainmen with headquarters in Cleveland, Ohio; O. T. Lafever, James Smith, George Duncan, C. N. Herb, A. N. Miller, W. J. Clark et al. Montgomery and Farquarson came to Los Angeles in July, 1918, according to reports, and tried to organize and unionize the employees of the Pacific Electric. It was at the peak of the war with Germany and thousands of men were daily passing over the company's lines between the shipbuilding plants at Long Beach and San Pedro Harbors, also from the rendezvous of troops at the Arcadia Balloon Training Camp and Ft. MacArthur. The temporary order of the U. S. Judge broke the contemplated strike. The union officials demanded that the employees quit the service unless the unions were recognized, but this was not done.

It has been deemed best by the Pacific Electric Railway that the temporary restraining order be made permanent, so as to avoid any recurrence of the industrial crisis which threatened in 1918. The temporary order restrained the defendants from interfering with the employees of the Pacific Electric Lines; from unionizing the employees; from interfering with the trains or trespassing on the property of the company.

The hearing of the company's petition in the United States District Court was held before Judge Frank M. Rudkin of Spokane, Wash. The temporary restraining order of July 2, 1918, as issued by Judge Bledsoe was confirmed by the U. S. Circuit Court of Appeal.

The first day of the hearing brought an effort to make it appear that the strikers who had engaged in the July, 1918, strike had no connection with officers that managed the strike on the company's lines in August, 1919, and that they had been quiescent since Judge Bledsoe issued the temporary injunction in 1918. On the other hand, there was a strong line of testimony showing that the defendants and members of the unions had maintained hostility to the railway and were only awaiting the opportunity that would be afforded by the refusal of the court to make the restraining order permanent to start another attempt to unionize the employees of the line.

Judge Rudkin informed the defendants that if the officers of the lodge proposed to shield themselves behind the cloak of secrecy obtaining in an organization of that sort that the presumption would be against them. This brought the attorneys of the defendants to their feet as one of their witnesses, F. R. Fish of the Brotherhood of Locomotive Engineers, had signed a circular dated Feb. 12, 1922, that asked for a postal-card vote on the question as to the payment of strike benefits growing out of the strike of July, 1918—this to show that the present officials of the unions were still behind the strike of 1918.

In presenting the grounds upon which the plaintiff corporation asked that the temporary injunction be made permanent, railway counsel said that among the members of the Railroad Trainmen and the Brotherhood of Locomotive Engineers the strike of July 2, 1918, was still regarded as "on." John Chriss, a motorman, gave testimony of the efforts to organize the employees in 1918, and said he had been told by A. N. Miller, a union organizer, that it was the intention to unionize the Pacific Electric, and that there would be $15,000,000 of the funds of organized labor to make the drive a success. If he did not join he would be blacklisted.

Attorneys for the defendants claimed that the preliminary restraining order was a war measure and that the ban ought to be lifted so that the men might organize if they now desired to do so. He would not admit that they intended to do so, but asserted that there was no law in the land against men organizing for a lawful purpose. "Dissolve this temporary order," he said, "and if the men disobey the law in any way, bring a new action."

The strike is still on, railway counsel stated, and if the pending injunction is dissolved, the work of unionizing the Pacific Electric Railway will be resumed. Defendant's attorneys in addressing the court asserted that the strike was favored only by the employees of the railway, and not by Messrs. Montgomery, Farquarson and others.

The hearing lasted four days. Judge Rudkin then took the matter under advisement. It will take about two weeks to render a decision. The railway counsel in his final plea to the court asked that the power of the court be imposed against outside interference, and that the defendants be compelled to cease trying to unionize the lines.

What is known as the Hitchins Coal & Coke Company case, in which a sweeping injunction by the United States Supreme Court was issued restraining union-labor organizers from operating among the men employed in West Virginia mines has been largely relied upon by the plaintiff corporation, in the pending proceedings.

Counsel for the defendants argued that the temporary restraining order was a war-time act and that unusual conditions were in evidence, that did not now obtain.

New York Fare Bill Amended

The bill recommended by the New York Transit Commission defining its authority to change rates of fare on New York City traction lines has been amended in both Houses.

The mandatory fare provision is changed so as to except common carriers other than street railroads not included or proposed by the commission to be included in the general plan of readjustment. This change, it is explained, is to avoid any conflict with the general powers of the commission in fixing rates for steam railways between points within city limits.

Another change clarifies the provision that on termination of the lease between the Interborough Rapid Transit Company and the Manhattan Elevated Railway for the operation of the lines of the latter, the commission may require that joint operation be continued for one fare.

There is taken out of the law the clause fixing definitely the salaries of the commission's counsel and secretary so that they may be fixed in the commission's discretion.

At the insistent demand of Corporation Counsel O'Brien, the public service committee of the Senate has agreed to send the measure, now on third reading, back to the committee for a hearing.

Chicago Subway Plan Not Yet a Reality

Chicago is again indulging in dreams about subways which may or may not materialize. Newspapers in that city rceently published a plan for a comprehensive rapid transit system which is said to have been agreed upon by the committee of engineers recently appointed by the local transportation committee of the City Council, although no official report has been made by that body. The plan is said to contemplate 56 miles of tubes providing for 131 miles of single track with a view to carrying over 1,000,000,000 passengers a year. The city has not been able to interest the surface or elevated companies in its project and if the subway is to be constructed as an independent system the only fund available is about $30,000,000, which it is realized would not go far to carry out the plan.

Franchise Draft Rejected

The City Council of Spokane, Wash., recently rejected the proposed franchise submitted by representatives of the Washington Water Power Company and the Spokane & Eastern Railway & Power Company. The franchise provided for a merger of the local traction systems with service-at-cost upon a 7-cent fare basis. The franchise also provided for the elimination of jitneys.

The Corporation Counsel was ordered to draft a new franchise providing for a 6-cent fare without service-at-cost and with no provision for the elimination of buses.

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Supreme Court Denies Review of Decision

The Supreme Court of the United States recently denied the application of the Puget Sound Power & Light Company of Seattle, Wash., for review of a decision rendered against it by the U. S. District Court for Western Washington, in proceedings brought against S. B. Asia, Daniel W. Bass and others. The power and light company, as the owner of $15,000,000 Municipal Street Railway bonds of Seattle, sought to set aside a decision obtained by Asia and his associates in a suit brought by them against the city to restrain, among other things, the application of the gross revenues of the municipal railway system to the payment of principal and interest on the bonds in preference to charges for maintenance and operations. Brief mention of the decision in this case was made in the ELECTRIC RAILWAY JOURNAL for March 11.

Counsel for the "fourteen taxpayers" expressed gratification at the Supreme Court's decision, pointing out that the high court in sustaining District Judge Jeremiah Neterer has kept the way clear for the taxpayers' litigation in the state court, seeking to protect the tax fund of the city of Seattle from encroachment by the municipal railway. The taxpayers' action against the city in the state court is now before the State Supreme Court on an appeal from a decision of Judge J. T. Ronald.

Another phase of the litigation over the municipal railway, the suit of the Puget Sound Power & Light Company to compel "specific performance" by the city of the terms of the contract by which the city bought the company's lines for $15,000,000, will be taken befor the U. S. Circuit Court of Appeals by the city of Seattle, which lost in the decision of Judge E. E. Cushman in the U. S. District Court there recently.

Commission Announces Stand on Recent Court Rulings

Little change, if any, will be made in the work and jurisdiction of the California State Railroad Commission by the recent decisions of the Supreme Court in the Wisconsin and New York cases in relation to state rates under the federal transportation act. This is the view of the members of the commission. No new principle, it is said, was announced in the cases, the principle that state rates influencing interstate rates come within the jurisdiction of the Interstate Commerce Commission having been established in previous cases. The later decisions merely confirm the earlier doctrine. The commissioners add that even if the state railroad board had nothing to do with railroad rates, it still would have much work before it in keeping the roads in condition to serve the public properly.

The views of the commission were contained in a statement by Commissioner H. D. Loveland, who stressed the fact that the people of California should realize that the regulation of railroad rates constitutes a rather small share of the commission's work. He said that the name "railroad commission" was a misnomer dating back to the time when the regulation of railroad rates was the commission's only function. He said that since the passage of the public utilities act in 1912 the California Commission has been a public utility commission.

Bill Provides for Comprehensive Transit Scheme

Development of a system of rapid passenger traffic between New Jersey cities lying within the territory covered by the Port Authority plan and between the municipalities and Greater New York is provided in a bill introduced in the State Legislature. The measure creates a commission of seven members to investigate and report on passenger traffic facilities in the state embraced in the Senate Port Authority treaty. The commission will co-operate with the Port Authority. The bill carries an appropriation of $5,000 for expenses, the commissioners to serve without compensation and to be appointed by the Governor. The bill says the commission shall have power to study and report upon the best plan or plans to be followed in providing a comprehensive scheme of rapid transit between its several communities in North Jersey as well as between such communities and the city of New York.

Interpretation Asked of Recent Wage Award

Employees of the Springfield (Mass.) Street Railway are trying to bring about an early hearing by the arbitrators in relation to certain points in the recent awards the interpretation of which is in dispute. Complaints relate more especially to the application of the provision for a fourteen-hour spread, with guarantee of seven hours pay, for spare men. In a readjustment of schedules the company was enabled to split certain runs in a manner to reduce operating expenses. This is done by shifting men at the carhouses or some other convenient transfer point, so as to avoid paying for dead time. The men contend that the management has no right to take a man off a run before the run is completed, to transfer him to another run. Another contention is that the fourteen-hour spread must be confined to a certain calendar day, which would mean that spare men could not be sent out after 10 o'clock in the morning under this arrangement. It is urged by the men that such a limitation is needed to assure proper rest and sleep between two fourteen-hour spreads. The management expresses confidence that it has correctly interpreted the arbitrators' decision, and says that the fourteen-hour spread is being applied in the same manner as it has been in Worcester for years.

Franchise Settlement Hinges on Auto Regulation

In Decatur, Ill., the Decatur Railway & Light Company, a subsidiary of the Illinois Traction Company, is seeking to negotiate a franchise extension. M. L. Harry, manager for the company at Decatur, recently outlined the conditions that should govern any grant made in that city at this time. He said that the new franchise must protect the company and the public and must be such as to enable the company to establish credit so that it can borrow money for extensions. It must be elastic enough to employ changes in transportation methods should such changes develop and above all it must protect the company against irresponsible, unregulated and unburdened competition.

The matter which looms up as most important in Decatur is one of protecting the company adequately against unfair bus competition. Mr. Harry indicated that until the matter of terms that shall govern bus operation in Decatur is decided, consideration of other terms of the franchise would be a waste of time.

Time Is Extended in Which New Haven May Dispose of Trolleys

In the United States District Court at New York, Judge Hand has signed an order extending until July 1, 1923, the time allowed the New Haven Railroad, by the decree of Oct. 17, 1914, to dispose of certain securities. The original decree was entered in a suit brought by the United States under the anti-trust laws and required the New Haven and the New England Navigation Company to dispose of the stock which they held in the Connecticut Company, the Berkshire Street Railway, the Vermont Company, New York & Stamford Railway, Westchester Street Railway and the Shore Line Electric Railway, as well as bonds of some of the foregoing, and the gold notes of the New England Investment & Security Company.

New Publication in Nashville

The Nashville Railway & Light Company, Nashville, Tenn., is now publishing a monthly magazine called the *Rail-Light News*. The first issue was that of January and started the four-page paper on a successful life by giving just the news the members of the company wished to know.

The magazine not only sets forth the advantages of a laugh in a column adjacent to news of a safety contest and a story of the meaning of the Employees' Mutual Benefit Association but it also tells the latest gossip. He who is attempting to grow a mustache will find his name and his deed duly chronicled in the *Rail-Light News*. The publication is conducted for and by the employees of the Nashville Railway & Light Company and serves as a clearing house for their ideas and their problems.

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Death and Destruction Follow Explosion

Seven Men Killed and More Than Score Injured in Compressor Accident in Kansas City

The air compressor tank in an isolated room connected with the machine shops of the Kansas City (Mo.) Railways exploded on the morning of Tuesday, March 7. As a result seven men were killed, an eighth man was seriously injured and twenty others were slightly injured.

The tank that exploded was the main tank used for supplying air in the shops; it was of ⅜-in. steel, 5 ft. by 20 ft., mounted on stanchions. It was attached to an Ingersoll-Sargeant compressor, equipped with safety valve. The tank had a 4-in inlet and a 3½-in outlet pipe. The tank was equipped with pressure gage and a safety release valve. In addition to these guards, there was an "unloader" connected with the pressure piston. This unloader operated automatically; but it also could be operated manually, in case of necessity. The compressor tank was operated under 110-lb. pressure.

TANK AND COMPRESSOR ISOLATED

The tank and compressor were located in a room by themselves, near the northeast corner of the one-story structure covering about 200 ft. by 400 ft. constituting the machine shops of the railway at Ninth Street and Brighton Avenue. The tank room was separated from adjacent rooms of the building by brick walls; there being only one door into it from the nearest machine shop room. Adjacent to the tank room was a two-story section of the machine shop structure, the second story being occupied by offices. The second story room of the part of this office section immediately contiguous to the tank room, was used for rest quarters for girls.

One employee had charge of the tank room. Although the compressor equipment was entirely automatic, and could be started in the morning and left unattended normally, this employee was provided as an additional precaution against suspension of compressor service. This employee started the compressor, as usual, when the shops opened at 7:15 a. m., on March 7. He was alone in the room when the explosion took place eight minutes after starting. The walls of the tank room were shattered, both the outer wall of the room, and the brick walls separating it from the other parts of the shop. The compressor attendant was killed; the men injured were in the machine shop rooms adjoining. Part of the floor of the adjacent two-story section fell, but nobody was in that section at the time.

The tank and fittings were destroyed; the only piece of apparatus of importance found to be intact after the explosion was the unloader valve of the pressure piston. This valve was still found to be easily workable with slight pressure.

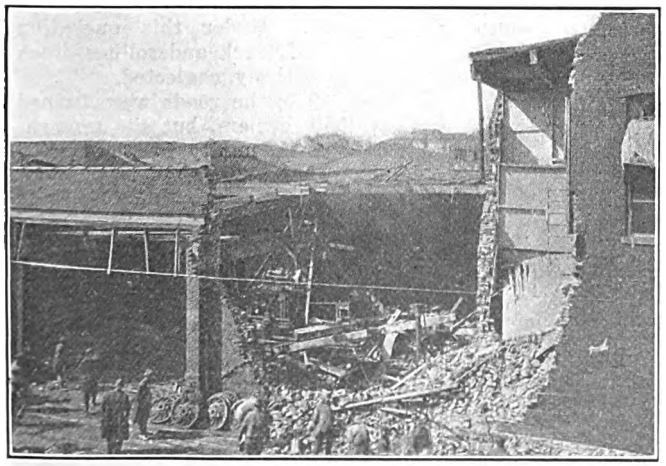
The compressor equipment had been installed about ten years ago, replacing similar equipment that had operated without accident for the previous ten or fifteen years. The equipment which exploded had been rebuilt and overhauled just twelve weeks before the accident; it had been inspected by state authorities within the past month in the usual routine of inspection.

The shops were in operation within two hours after the accident; tarpaulins were spread over the roofs, and car compressors had been built up in series to provide air for replacing the service of the destroyed tank equipment. The following morning the shops were working at 100 per cent of personnel; and the rebuilding of the tank room was in progress.

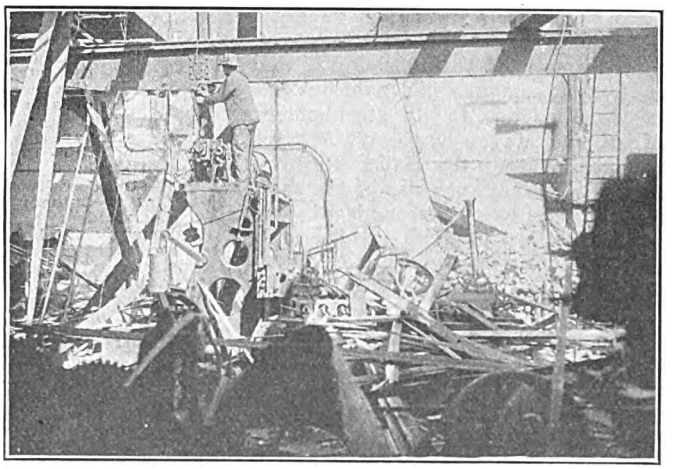
The property damage amounted to about $20,000, chiefly to the adjacent parts of the building. Windows were shattered in the entire shop building including all the skylights; and in some neighboring houses.

Engineers who have investigated the accident remark that evidently there must have been an extraordinary combination of disabilities in safety factors to produce the accident—one such possible combination in a million chances, when the various safety valves should simultaneously fail to function at a time when pressure reached excessive limits, and the warning of danger be so brief that the attendant could not himself trip a valve. The attendant had been employed solely in the compressor room for many years.

WALL WHICH SEPARATED THE TANK ROOM FROM THE ADJACENT SHOP ROOM WAS DESTROYED IN THE EXPLOSION



LOOKING INTO THE SMALL ROOM WHERE THE COMPRESSOR EQUIPMENT WAS LOCATED



LOOKING NORTH THROUGH THE TANK ROOM; ONE OF THE TANK STANCHIONS IS SEEN STANDING, ANOTHER LEANING FORWARD

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Fight in Dallas

Railway and City Come to Open Disagreement on Six-Cent Fare and Excess Earnings Disposition

The Dallas (Tex.) Railway and officials of the city of Dallas have come to an open breach over the question of a 6-cent fare and what disposition is to be made of the excess earnings under the 6-cent fare. It has just developed that the Dallas Railway has been applying the excess in earnings over and above the authorized 7 per cent, as provided in the franchise, in paying dividends on the ground that the stockholders are entitled to a return of 7 per cent for the full time the company has been operating under the new franchise, or since October, 1917.

Mayor Sawnie Alldredge and members of the Board of City Commissioners take the position that the excess earnings of the company, earned under the 6-cent fare, granted on June 16, 1920, cannot be used in paying dividends, but must be expended in improvements and betterments, inasmuch as the 6-cent fare was granted with this proviso and because the traction company declared it was not financially able to make certain improvements deemed by the city to be imperative.

The controversy over earnings arose when the Dallas Railway sought approval of a requisition calling for construction of a car line on Forney Avenue to be used by the Dallas-Terrell Interurban in entering the city. The City Commission took the position that the line on Forney Avenue should be built by the interurban company and leased to the Dallas Railway for local street cars, this being the policy in regard to other interurban lines entering the city. The city commissioners declared that the increased valuation by reason of the traction company's building the Forney Avenue line, and the fact that there would be no revenue from such investment, would tend to decrease the earning capacity of the company and would thereby tend to increase fares. This led to an investigation of the traction company's books, and then it was discovered that the excess earnings over and above the 7 per cent since the 6-cent fare was granted amounted to $100,000 and that the traction company had paid out this sum in dividends to its stockholders.

Then, the Mayor wrote W. M. Holland, president of the Dallas Railway, advising him that such use of the earnings of the company neither legally nor morally justified and calling on him to have the stockholders place back in the company's treasury the sum of $100,000 to be used in improvements and betterments as provided in the agreement under which the 6-cent fare was granted. The Mayor at the same time gave notice that the city would open and conduct a hearing on a proposal to reduce street car fares in Dallas to 5-cents.

Mr. Holland, president of the Dallas Railway, took note of Mayor Aldredge's communication and departed for New York and Boston to confer with the owners of the Dallas Railway in regard to the situation and the possibility of the city forcing the traction company to return to a 5-cent fare. The hearing was set for April 6.

The statement issued by Mr. Holland admitting that $100,000 in excess earnings of the company had been distributed in past-earned dividends since the 6-cent fare was granted in 1920 and making the proposal that the stockholders loan the company $100,000 for improvements in part is as follows:

> Dallas Railway will announce "ready" on April 6 on the 6-cent fare hearing. If assured of a reasonable return on their investment the stockholders are ready and willing to loan the Dallas Railway, with which to make necessary extensions, all amounts earned toward making good the deficit in the authorized return, by reason of which there is already available approximately $100,000. The borrowing of this money by Dallas Railway will not increase the property value of the company until the money has been expended for such extensions.
>
> The few weeks I have been connected with Dallas Railway (I assumed office Jan. 3) have convinced me that there are many rapidly growing sections of our city which are badly in need of street car extensions. It will be my policy as president, co-operating with the other officers and with the directors, to make these extensions just as rapidly as the finances of the company will permit. Such extensions should be made in the order of which they are most needed. The company, and I take it, the city, does not want investments made in unprofitable extensions, especially in view of the fact that there are profitable extensions which are badly needed.
>
> I see no good reason why the city authorities and the street car company cannot agree as to which extensions are most needed, and the order in which such extensions should be made.
>
> As an officer of the company and as a citizen of Dallas I am hopeful that our street car sitaution may be settled amicably and in a business-like manner. I know that such a settlement would be best for the company and best for the future growth and development of Dallas.

In reply to Mr. Holland's statement, Mayor Aldredge issued the following statement:

> The street railway company claims that it was within its legal rights in so doing, claiming that the franchise permitted it to take this action. I do not believe this would be true, even if the road were operating under the franchise requirement of a 5-cent fare on account of the fact that the paving obligations are primary and paramount obligations under the franchise and take precedence over the authorized return or the reserve. But I would call attention to the fact that this $100,000 was not earned under the franchise fare of 5 cents, but was derived from the excess profits of the 6-cent fare, which 6-cent fare was granted in order that the improvements could be made.
>
> Certainly the street railway company cannot take the position that the Board of Commissioners is required to grant a 6-cent car fare in order to permit it to pay off all past losses, hence the action in appropriating the $100,000 cannot be defended either legally or morally.
>
> The street railway company's admission that the money has been paid out to the stockholders and the statement that the company might borrow it back from the stockholders is amazing. In other words, the officers have appropriated this money, but now propose to borrow it back from themselves and pay themselves interest on it, which would mean that the people of Dallas would be paying interest to the stockholders of the street railway company on this $100,000, which belongs to the people of Dallas and not to the stockholders. Such a proposition is indefensible.
>
> In good faith and good morals the street railway company should immediately cause to be placed back in their treasury this $100,000, which has wrongfully been disbursed to the stockholders, and use the same for the improvements which the company is under obligation to perform.

Mexico City Strike Aims for Commission Control

Employees of the Mexican Light & Power Company, Mexico City, Mexico, are out on strike with the intention that Mexico City shall have no lights, no trolleys and no water. The Mexico Tramways Company, Ltd., with its subsidiaries, the Mexican Light & Power Company, the Mexican Electric Light Company and the Pachuca Light & Power Company, furnish the railway, power and light service of Mexico City and surrounding towns. The central power plant is at Necaxa.

Employees have endeavored to cut the transmission cable, but have thus far been prevented from doing so by government troops which guard the plant. Trolley service was discontinued on March 2, but water and light are still available and most of the business and residential buildings are lighted, although the streets are darkened.

The strikers are demanding that they be allowed to take over the power, light and street car systems and to operate them under a commission. Early in the strike a cable from Mexico City said that the British Consulate had been closed. London interests head the Mexican companies. This is generally thought to be due to the failure of the government to put an end to the strike.

These companies have had more or less continuous trouble during the revolutionary times in Mexico. In the latter part of 1914 Carranza captured Mexico City. Thereafter labor unions were formed which demanded that wages be raised 25 per cent, that all charges be approved by the unions, and that the company consent to certain operating conditions which would in reality subject the company to union control. The company refused the terms, whereupon the employees went out on strike and operation ceased.

Enough men could have been recruited to provide normal service, but no protection was forthcoming from the government and the danger without protection was too great. The Federal district, under order of the constitutionalist government, took over the operation of the systems and salaries were very shortly doubled or increased 25 per cent. Under this operation maintenance of track and rolling stock was almost entirely neglected.

In May, 1920, the roads were turned back to their owners, but the government paid no indemnity for the period of its operation.

$10,000 for Safety Bonus

The San Diego (Cal.) Electric Railway distributued $10,000 to platform employees recently in "safety checks." The fund is that left over from the accident fund after all claims for injury and damage had been settled. The amount of the check for each individual is based upon the number of hours of service of each employee. The amount of the checks averaged $50 this year, while one man received as high as $77.

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Financial and Corporate

$4,464,826 Loss by I. R. T.

$10,511,002 Now Piled Up in Accumulated Deficits Over Three-Year Period

The Interborough Rapid Transit Company, New York, N. Y., in its annual report of operation during the year ended June 30, 1921, shows a deficit of $4,464,826, as compared with a deficit of $2,235,835 for 1920. Gross operating revenues for the year amounted to $55,031,941, comparing with $51,478,410 in 1920, an increase of $3,553,530, or 6.90 per cent. This result was accomplished by a gain on the subway division of $3,204,441, or 10.13 per cent and a gain on the Manhattan Railway division of $349,088, or 1.76 per cent.

The gain in the revenue from the transportation of passengers was $2,933,925, and the increase in the other street railway operating—principally from the sale of power—was $619,604. Operating expenses for the year were $36,024,646, as compared with $31,695,208 the preceding year, an increase of 13.66 per cent, of which 20.19 per cent or $3,667,816 was on the subway division.

COMPARATIVE STATEMENT OF INCOME ACCOUNT

Year Ended June 30	1921	1920
Gross operating revenue..	$55,031,941	$51,478,410
Operating expenses.....	36,024,646	31,695,208
Net operating revenue..	$19,007,295	$19,783,201
Taxes.....	2,735,694	2,623,410
Income from operation.	$16,271,600	$17,159,791
Non-operating income....	639,123	608,368
Gross income.....	$16,910,724	$17,768,159
Income deductions.....	21,375,550	20,003,995
Net corporate income for the year.....	*$4,464,826	*$2,235,835
Add:		
*Surplus, June 30, 1920 and June 30, 1919.....	$7,093,100	$10,152,092
Other credits.....	34,779	5,126
Totals.....	$2,663,053	$7,921,383
Appropriated for:		
Loss upon sale of Liberty Bonds.....	$394,756	.....
Loss upon sale of real estate.....	.....	$809,190
Amortization, capital retirements and other charges.....	25,418	19,091
Total appropriations...	$420,174	$828,282
†Profit and loss—surplus	$2,242,878	$7,093,100
*Deficit.....		

†Stated exclusive of accruals under Contract No. 3 and related certificates payable from future earnings.

The report indicated a net operating revenue of $19,007,295, as compared with $19,783,201 for 1920, a decrease of 3.92 per cent. This was the result of a loss on the subway division of $463,374, or 3.44 per cent, and a loss on the Manhattan Railway division of $312,532, or 4.94 per cent. The income from operation was $16,271,600, a decrease of 5.17 per cent, as compared with $17,159,791 for 1920, while non-operating income stood at $639,123, as against $608,368 the preceding year. This increase of 5.05 per cent was explained by the increase of $44,605 on the subway division, although non-operating income on the Manhattan Railway division decreased $13,850 during the year, or 18.84 per cent.

Income deductions amounted to $21,375,550, as compared with $20,003,995 for 1920, an increase of 6.85 per cent. Details of the year's operation, as compared with 1920, are set forth in the accompanying table.

In his remarks to the stockholders President Frank Hedley said in part:

The number of passengers carried was 1,013,678,831, compared with 955,133,110 last year, an increase of 58,545,721, or 6.13 per cent, the result of a gain on the subway division of 53,287,147, or 9.02 per cent, and a gain on the Manhattan Railway division of 5,258,574, or 1.42 per cent.

The gain on the subway division reflects the increase in passenger business incident to the operation of the new lines constructed and equipped under Contract No. 3 and operated in connection with the old subway lines.

The sum of $8,418,325 was spent during the year for maintaining the structure, roadway, power houses, electrical equipment and rolling stock in good operating condition. This sum included the renewal of rails on 2.5 miles of single track and 24,316 ties on the Manhattan Division and 13.92 miles of single track and 10,149 ties on the Subway Division; $4,669,264 was spent for additions and betterments to the property.

Your property was operated during the last year at a loss of $4,464,826, notwithstanding the practice of every economy it was possible to conceive. The net revenue, after the payment of operating expenses and taxes, was insufficient by this amount to meet the interest and sinking fund on the 5 per cent bonds and 7 per cent notes issued for construction and equipment of road in operation. This is the third consecutive year of cumulating deficits, the company having failed to earn its fixed charges in 1919 by $3,810,339 and in 1920 by $2,235,835.

The increase in the deficit this year over the year 1920 was caused by increased charges for operating expenses, taxes and for interest and sinking funds aggregating $2,259,705 in excess of the increase in gross operating revenue for the year. These accumulated deficits totaling $10,511,002.25 have so far as possible been taken care of by the application of the remaining surplus, the sacrifice of assets and the forbearance of our creditors, in order to keep the service going and avoid a condition of disintegration and chaos similar to that now existing on the surface lines.

Notwithstanding these deficits the growth of traffic has been continuous. In 1905 the subway and elevated lines combined carried 339,104,820 passengers. This number increased gradually with each year until 1921 these combined lines, including the recent additions, carried 1,013,678,831 passengers. In 1905 the number of passengers carried per mile of track was 2,214,634, while in 1921 it was 2,773,479, an increase of over 25 per cent in the face of an increase in the mileage of over 138 per cent. Since the opening of the new lines in the latter part of 1918, there has been an average increase of 81,000,000 passengers per annum. The present subway ramifications have more than reached their limit on a 5-cent basis and to attempt anything further would be entirely to disregard all economic laws.

First Dividend in Four Years

The directors of the Worcester (Mass.) Consolidated Street Railway on March 13 declared a dividend of $2.50 a share on its preferred stock. This is the first dividend declared by the company in four years. It is payable on April 1.

United Traction Report Forecasts a Brighter Future

The report of the United Traction Company, Albany, N. Y., for the quarter ended Dec. 31, 1921, shows a more hopeful outlook for the return of this company to a normal basis. Although the operating revenues for the quarter ended Dec. 31, 1920, were $227,290 more than in the same quarter for 1921 still the expenses for the 1921 quarter were decreased by the sum $270,083.

The net deficit from railway operation in the last quarter of 1920 amounted to $30,493 while in the last quarter of 1921 there was a net gain of $12,301.

The traffic in the last quarter of 1921 increased considerably over the third quarter of the same year. The number of passengers advanced from 3,540,995 in the third quarter of 1921 to 8,824,574 in the last quarter.

The report submitted makes also a comparison of the entire year operation against operation in 1920. The effect of the strike is seen in a comparison of these figures. The total revenues for 1920 amounted to $3,253,973 and in 1921 they were $1,197,783. The net corporate income for 1920 was a loss of $416,510 and for 1921 the railway company reported a loss of $2,208,409.

Oakland Property Realizes Surplus of $49,297

At the annual meeting of the stockholders of the San Francisco-Oakland Terminal Railways, Oakland, Cal., which was held in the company's offices on March 7, 1922, W. R. Alberger, vice-president and general manager, said, among other things, that the general business depression of the year 1921 had not materially changed the company's condition and that it was in practically the same position at the end of that year as it was at the close of the year 1920. He stated further that better service had been provided in 1921 than during the previous year by putting more cars in service, which increased the car mileage from 16,849,400 in 1920 to 16,887,649 in 1921 and that the improved service caused an increase in car-hours from 1,672,865 in 1920 to 1,684,088 in 1921.

The company's gross operating revenue amounted to $6,872,597 and operating expenses were $4,853,032. The final surplus of the year was $49,297. It was stated that the revenues of the company for the year 1921 compare favorably with those of the previous year, regardless of the fact that certain decreases were suffered by the gradual closing down of the shipping industry and the general downward trend of business during 1921.

The stockholders were informed that the federal, state, county and Municipal taxes for the year 1921 increased 14.75 per cent as compared with the year 1920 and that the increase was practically all due to taxes paid the State of California.

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Mitten Men Elected

Bolting Directors All Deposed at Annual Meeting of Stockholders on March 15

Thomas E. Mitten had it all his own way at the meeting of the stockholders of the Philadelphia (Pa.) Rapid Transit Company on March 15. The entire slate of directors sponsored by him was elected to the board. The vote was overwhelming. In fact, it was unanimous, as the opposition chose to remain silent. It was the largest vote ever cast at any election of the stockholders. All of the 520,637 shares voted were in favor of the Mitten slate. There are 600,000 shares outstanding. This reduces to figures the measure of the Mitten victory. Thus another important step was taken in the policy of management and men toward the perfection of which Mr. Mitten has been working ever since he took hold of the property more than ten years ago.

The slate of directors as now constituted consists of T. E. Mitten, W. C. Dunbar, G. A. Richardson, C. J. Joyce, H. G. Tulley, Nelson Robinson, John W. McElroy and Dr. A. A. Mitten. Mr. McElroy and Dr. Mitten represent the employees on the board. Mr. McElroy is the president of the Employees' Co-operative Welfare Association. Dr. Mitten is the understudy of Mr. Mitten in the co-operative welfare work.

Dividends Ahead

These briefly are the outstanding facts of the election. There is much more to the story, however, than the mere recording of names. It is the ideas behind the names that count and these as the management sees them are (1) service to the community; (2) management in the true interest of the security holders; (3) participation in the financial results achieved by the employees who make the results in dollars possible. If the hopes of President Mitten and his fellow co-operators are attained then after the payment of dividends of 6 per cent to the stockholders has been made for 1922 the employees will participate for their super-co-operation during the year in an amount not to exceed 10 per cent of the payroll.

There have of course been employee directors of electric railway companies before, but never before have the same elements of unity been combined as now in Philadelphia. The whole situation was, perhaps, summarized best by Mr. Mitten in a short speech which he made at the demand of the employee stockholders at the conclusion of the meeting. He said that the incidents of the meeting with its consummation in the election of the slate sponsored by him made quite worth while the eleven years of toil and effort which have marked his management of the property. The responsibility has been great, but he now recognized an added responsibility and was sure the men recognized it. Everything that had recently been said about the prospects for the future under the new order must be made good. A year ago the stockholders were told that the need existed for putting the property back into the very best shape following the retrenchment necessary during the war-time period. That work has in the main been carried out. The day for dividends was dawning. A great furore had been made in some quarters about one-man management. Mr. Mitten said there was no one-man management. There was, however, one-man leadership. In conclusion Mr. Mitten said that never would the employees regret their vote of March 15 if proper co-operation were continued with the management.

Directors Operating Experts

These are the directors who will serve the company during 1922: T. E. Mitten, W. C. Dunbar, G. A. Richardson, C. J. Joyce, H. G. Tulley, Nelson Robinson, John W. McElroy, Dr. A. A. Mitten, the Mayor and two city directors, appointed by the City Council by virtue of the 1907 city contract. Mr. Mitten with four immediate associates, Messrs Dunbar, Richardson, Joyce and Tully, representing the highest developed skill in their particular lines, as directors will also serve as the executive committee, reporting monthly to the board of directors. Mr. Dunbar is vice-president in charge of finance and accounting; Mr. Richardson is vice-president in charge of operation; Mr. Joyce is counselor to the company; Mr. Tulley although president of the International Railway, Buffalo remains the responsible head of the co-operative welfare activity in Philadelphia under the Mitten management. It is conceded that Mr. Tulley, perhaps more than any other man, is responsible for solving the labor problems of the P. R. T. Mr. Robinson is a capitalist and philanthropist. He has supported and backed Mr. Mitten in Buffalo and elsewhere since 1900 and is a believer in the Mitten policies and management. He has been a regular attendant at Mr. Mitten's meetings with his men during the ten years of struggle and accomplishment in Philadelphia. Brief sketches of Mr. McElroy and Dr. Mitten appear in the department "Personal Mention," elsewhere in this issue.

Meeting in Democratic Surroundings

As for the meeting itself it convened at 11 a.m., in the room of the Co-operative Welfare Association at the Luzerne carhouse. Of the mechanics of the meeting and the voting nothing need be said. There was a very large attendance. Although the great bulk of the voting was done by proxy a number of the employees insisted upon casting their own votes. Among the attendants were a number of ladies, among them Mrs. Rudolph Blankenburg, wife of the late Mayor of Philadelphia. Mrs. Blankenburg is a stout supporter of the Mitten policies. Only two of the bolting directors, Messrs Matthews and Tripple attended. They were conspicuous by their silence. The directors who were replaced were W. J. Montgomery, William Y. Tripple, Frank Buck, C. J. Matthews and W. J. Montgomery. The men who replaced them were Dr. Mitten, Mr. Tulley, Mr. Joyce, Mr. McElroy and Mr. Robinson.

The deposed directors were reticent about making any statement after the meeting. Mr. Matthews, however, said:

> We are through as directors. We made a pretty fight, and we came out the wrong end. We made no great appeal for support—we merely sent out our announcements and did not go further.

In view of the developments at the meeting the remark may readily be believed that was reported to have been made by one of the deposed directors that when Mr. Mitten had an idea he usually acted upon it thirty days before anybody else who happened to have the same idea at the same time.

Officials Ready to Discuss Separation of Properties

In his annual report W. Kesley Schoepf, president of the Cincinnati Traction Company, stated that the total number of revenue passengers carried on the Cincinnati Traction and Millcreek Valley lines for 1921 was 106,527,759. The previous year the total was 118,618.862. Estimates furnished the city officials indicate that the present rate of fare will furnish sufficient revenue to meet all expenses for the year 1922 with the exception of the amount necessary to pay the franchise tax.

Traction company officials, Mr. Schoepf said, were now ready to meet Mayor George P. Carrel's Committee to discuss readjustment and the separation of the properties of the Cincinnati Traction and the Cincinnati Street Railway companies.

President Schoepf declared that traction companies throughout the United States had experienced the worst slump in years. He also outlined a number of proposed improvements and said that consideration would be given to the "trackless trolley" this year in the suburban districts.

Announcement of Discontinuance Expected

It is generally understood in electric railway circles in Hartford that announcement may be made any time of the discontinuance of the interurban railway service between Hartford, Conn., and Rockville. Should the order be made, the Connecticut Company proposes to establish a half-hour service between the two places by means of surface cars. The interurban runs for most of the distance over the steam tracks of the New Haven Road. The Connecticut Company has threatened before to discontinue the interurban service, but the Public Utilities Commission has insisted that operation be continued.

Municipality officials of Rockville are protesting the abandonment of the service. It is contended by the Connecticut Company that the line is and has been for some time a losing proposition. That the line will be abolished is now almost certain.

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Minnesota Commission Concludes Hearings in First City Railway Case

Valuation Estimates Presented by Engineers for Company — Cost of Power Contract Item of Value

On Feb. 28 at St. Paul attorneys submitted oral argument in the Duluth Street Railway valuation and fare case, now under consideration by the Railroad & Warehouse Commission of Minnesota. As this is the first street railway valuation and rate case to come before the commission, the decision is awaited with much interest, especially as this commission will not be hampered by earlier precedents of its own and will have the benefit of the more recent decisions of the leading commissions and courts, which are now taking a broader view of the valuation problem. The tendency of later decisions is to restore the credit of these essential utilities and eventually return them to a normal basis as set forth in the recommendations of the Federal Electric Railways Commission, of which Charles E. Elmquist, formerly of the Minnesota Commission, was chairman.

In order that the commission might have full data as to this property in its first electric railway case the railway company made special effort to submit very complete evidence as to the valuation of the property, the earnings and the financial predicament of the company, which is much the same as that confronting practically all other electric railways, viz., the necessity of obtaining new capital for extensions and improvements of service with existing low market prices on electric railway securities and inability of the company to earn sufficient net to justify issuance of additional securities under the terms of their trust deed.

The evidence was submitted in hearings at Duluth and St. Paul during January and February, at which time A. L. Drum & Company, consulting engineers, Chicago, submitted a report on the cost of reproducing and developing the property of the Duluth Street Railway. An inventory was made of the Duluth Division of the property as of July 1, 1921, and the final report of the engineers estimated the cost of reproducing and developing the property on the following bases, a summary of these valuations being given in the accompanying table: (1) pre-war cost, using current prices as of the year 1915; (2) ten-year average cost, using average of prices for the ten-year period 1912 to 1921, inclusive; (3) present day cost, using current prices as of June 1921; and (4) estimated original cost, using prices in effect as of the date the various parts of the property were installed or purchased.

An interesting feature of this valuation was the method adopted for valuing the power contract. The company purchases all of its primary power from the Great Northern Power Company, an independent hydro-electric power company. During the development of this source of power supply the railway was obligated to retain its own power plant as a stand-by plant from September, 1907, when the power company first delivered power until the power company released the railway from this item of the contract and the plant was sold in 1916.

The railway was required to pay the insurance taxes and interest on the plant from 1907, as well as suffer the loss of the investment in the plant (less salvage) at the time of abandonment. These items, constituting the actual expenditures of the railway in obtaining the power contract and perfecting a satisfactory source of power supply, were ascertained and reported as the value of the power contract.

Mr. Drum testified that the item of developmental costs represented a measure of the developmental and going concern value and indicated the costs that have been or would be encountered in creating and developing the property to its present state of efficiency. The expenditures for obsolete equipment and construction represent the capital included in the development of the property which has been superseded and replaced prior to the expiration of its useful life. The cost to unify the system represents an estimate of the cost incident to creating and consolidating the various companies into one system, now comprising the Duluth Street Railway Company, Duluth Division. The item included for loss of interest during operation represents the estimated deficit of return on the investment during the early period of operation up to the time the business had become established on a paying basis, which loss was estimated to be equivalent to one year's loss of interest of 8 per cent on the investment.

Mr. Drum also submitted the accompanying table, showing an estimate of the operating income for the year 1922 based on different rates of fare, with allowance made for decrease in passengers due to increase in fares.

THE DULUTH STREET RAILWAY, DULUTH DIVISION, ESTIMATED OPERATING INCOME FOR THE YEAR 1922

Based on Actual Passenger Fares and Revenue Car-Miles for the Year 1921.
Allowance Made for Decrease in Passengers Due to Increase in Fares.

	Rate of Fare				
	5 Cents	6 Cents	7 Cents Cash Six Tickets for 25 Cents	7 Cents	7½ Cents
Revenue passengers	27,200,000	26,112,000	25,568,000	25,024,000	24,480,000
Estimated decrease	None	4%	6%	8%	10%
Car-miles	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000
Passengers per car-mile	8.24	7.91	7.75	7.58	7.42
Operating revenue:					
Passenger revenue	$1,360,000	$1,566,720	$1,636,352	$1,751,680	$1,836,000
Other operating revenue	14,000	14,000	14,000	14,000	14,000
Total operating revenue	$1,374,000	$1,580,720	$1,650,352	$1,765,680	$1,850,000
Operating costs:					
Operating expenses	$1,010,130	$1,010,130	$1,010,130	$1,010,130	$1,010,130
Depreciation	134,303	134,303	134,303	134,303	134,303
Taxes	80,464	106,304	115,008	129,424	139,964
Total operating costs	$1,224,897	$1,250,737	$1,259,441	$1,273,857	$1,284,397
Operating income	$149,103	$329,983	$390,911	$491,823	$565,603

THE DULUTH STREET RAILWAY—DULUTH DIVISION
SUMMARY OF COST OF REPRODUCING AND DEVELOPING THE PROPERTY AS OF JULY 1, 1921

Physical property:	Pre-War Cost Prices Current Year 1915	Ten-Year Average Cost Average Prices 1912-1921	Present-Day Cost Prices Current June, 1921	Estimated Original Cost Prices Current At Date of Installation
Cost to reproduce new	$4,828,084	$6,473,578	$8,220,384	$4,826,725
Power contract:				
Cost of power contract	379,542	379,542	379,542	379,542
Total	$5,207,626	$6,853,120	$8,599,926	$5,206,267
Developmental costs:				
Expenditures for obsolete equipment and construction	$693,688	$693,688	$693,688	$693,688
Cost to unify system	50,000	50,000	50,000	50,000
Loss of interest during operation	386,247	517,886	657,631	386,138
Total	$1,129,935	$1,261,574	$1,401,319	$1,129,826
Total cost of reproducing and developing the property	$6,337,561	$8,114,694	$10,001,245	$6,336,093

Bondholders Seek Greater Part in Receivership

Changes under the receivership of the Toledo & Western Railroad have been suggested by attorneys who appeared in Judge John M. Killits court at Toledo, Ohio, to object to motions now on file to expend earnings for improvements to the property and new equipment. It is alleged that of the $50,000 or more of earnings none has reached bondholders. The bondholders will seek representation in the receivership. They also ask that the court order payment in full of all stock subscribed for at the time the road was built and through later financing.

Attorneys for the receivers, J. Frank Johnson, operating head, and Harry Dunn, of the Ohio Savings Bank & Trust Company, and attorneys representing bondholders and Henry L. Doherty & Company, were requested to get together on the matter and work out a plan to be presented soon to the court.

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As Wall Street Sees It

Financial Authority Says Interests of Stock and Bondholders Are Cared For Under Commission Plan

The *Wall Street Journal* says that there appears in general to be no indications that a material disturbance of present security prices would attend upon the electric railways in New York accepting the Transit Commission's estimates of the values of the properties and assenting to the proposed plan of consolidation—an end which at present appears somewhat doubtful. Opening of negotiations with a view of accepting a plan in line with the commission's proposals may cause an appreciation in market values as strength of company claims develops in cases, for example, of companies having extensive non-operating property, valuable leases, and contractual obligations of potential value, such as preferential payment features of dual subway contracts, and large accruals payable from future earnings.

TITLE TO OPERATING PROPERTY TO BE VESTED IN CITY

It will be recalled that the commission proposes that companies vest title to their operating property in the city and take in return an equivalent in value of securities of a new company that is to be brought into existence. A further consideration shall be that companies, brought into a unified system and grouped in a manner prescribed by the commission, shall receive back new leases under which they will continue to operate privately but under the general direction of a Board of Control. New securities properly guaranteed are to be the sole basis of exchange, and it is for the purpose of making this exchange that valuations have been made.

The *Wall Street Journal* says:

The probability of interests of stockholders as well as bondholders being taken care of in the exchange is introduced by the plan of the commission which requires each company accepting the plan to take care of its own securities of whatever value, in its own way, and through a reallotment of new bonds among old security holders.

Property in Brooklyn Rapid Transit system which is useful for operation has been valued by the Transit Commission at $154,608,677; securities of the system representing a par value of approximately $227,000,000, had a market value on Feb. 16 around $108,000,000. Operating property of Interborough system (I. R. T., Manhattan Railway, and New York Railways—the latter including Eighth and Ninth Avenue companies as well as New York & Harlem) are valued by the commission at $261,476,046, while outstanding securities equal at par to $497,000,000 have a market value of $227,000,000. Commission values Third Avenue system at $33,967,430, while securities at par approximating $70,000,000 are appraised in the stock market slightly in excess of $35,000,000. Commission's valuation did not include property of three subsidiary companies operating in Westchester County.

ESTIMATES BY BOTH SYSTEMS

In addition to evaluating operating property of all traction companies based on original costs less amount necessary to put each property in first class operating condition, which basis the commission's bureau of valuation recommended for use in making the exchange, the commission announced a valuation of all operating and non-operating property based on cost to reproduce at 1921 prices less depreciation. Following are both estimates by systems:

Systems:	Valuation Recommended	1921 Prices Less Dep.
Brooklyn Rapid Transit...	$154,608,677	$194,756,352
Interborough Rapid Tran.	174,221,056	174,221,056
Original Manhattan Ry...	57,374,205	65,610,942
New York Railways (including 8th, 9th, and N. Y. & Harlem Railroad Co.)	29,871,785	75,261,442
Third Avenue	33,967,430	57,207,122
Second Avenue R. R. Co..	4,798,317	8,889,364
Staten Island companies..	4,215,713	5,470,070
Queens Borough com....	6,125,764	10,935,600
Miscellaneous companies.	497,207	716,061
Total	$465,680,154	$593,078,009

The *Wall Street Journal* says that the different bases of these estimates and the fact that non-operating property is included in one and not in the other, in some measure explains the difference in values for any system. Extent of accrued depreciation on the various systems also accounts for discrepancies as well as for lack of uniformity among the systems in relative differences between appraisals. Accrued depreciation on New York Railways property amounted to approximately 30 per cent of cost to reproduce; Third Avenue about 34 per cent; Manhattan Railway 25 per cent and Interborough 4 per cent. Percentages of non-operating property to total property varied from 14 per cent for New York Railways, 11 per cent for Queens companies and 6 per cent for Third Avenue, to 0 per cent for Interborough. Total of all non-operating property based on cost to reproduce in 1921 was $36,968,820. A tabulation of the commission's appraisal of land owned by systems as of June 30, 1921, follows:

System:	Land Not Useful For Operation	Land Used For Operation
B. R. T.	$2,494,077	$6,912,389
I. R. T.	950,000	5,618,508
N. Y. Rys.	2,460,800	9,474,600
Third Avenue	1,424,348	3,029,598
Second Avenue	84,000	565,000
Staten Island companies..	49,700	133,700
Queens companies	155,251	195,940
Total	$7,618,587	$25,929,735

Total property of all systems not used in operation, on basis of original cost less depreciation, is $13,259,920, of which land ($7,618,587) is the largest single item. Track and structures total $4,239,309; electrical equipment $1,014,236 and incidental expenses $387,788.

Receivers Appointed

The Dayton, Covington & Piqua Traction Company, operating between Dayton and Piqua, Ohio, was placed in the hands of receivers on March 13, on application of the International Trust Company, Boston. The petition, which was filed in the Federal District Court at Dayton, cited that the traction company had defaulted in the payment of $60,000 interest due on second mortgage bonds held by the trust company. The court appointed President Wert Kessler, West Milton, Ohio, and Vice-President T. Russell Robinson, Boston, as receivers. Company officials, pointing out that the company has been enjoying a good business, say that the trouble will be smoothed over without difficulty. The company has been operating the line for twenty-two years.

Financial News Notes

Same Officers Elected.—All officers and directors of the Pine Bluff Company were re-elected at the annual meeting of the stockholders and directors, recently held in Pine Bluff, Ark. Plans for the future were discussed but no definite program was decided upon.

Seven Per Cent Bonds on Sale.—Reilly, Brock & Company, Philadelphia, Pa., are offering $150,000 of the Georgia Railway & Power Company's general mortgage 7 per cent bonds due Nov. 1, 1941. The bonds are offered at 101½ and interest to net over 6.85 per cent.

Ashtabula to Vote on Municipal Purchase.—At a special election on April 24, voters in Ashtabula, Ohio, will decide whether the city shall purchase the property of the Ashtabula Rapid Transit Company. The company owns 5.5 miles of track and leases 1 mile. It operates the Ashtabula & Lake Shore Railway.

$7,500,000 Bonds Offered.—The National City Company, New York, N. Y., is offering $7,500,000 of The Northern Ohio Traction & Light Company's general and refunding mortgage gold bonds Series A 6 per cent dated March 1, 1922, and due March 1, 1947. The price of the bonds is 96 and interest to yield more than 6.30 per cent.

Increased Capital Authorized.—Stockholders of West Penn Railways, Pittsburgh, Pa., have authorized the board to increase the capital from $20,000,000 to $30,000,000. The present capitalization is $10,000,000 of common stock and $10,000,000 of preferred. The new stock is to be common issued from time to time for corporate purposes.

Valuation Case To Be Continued.—The valuation case of the United Railways, St. Louis, Mo., was taken up again by the Missouri Public Service Commission on March 6, and after sessions lasting three days was continued until March 27. W. B. Bennett and F. W. Doolittle, consulting engineers representing the company, were examind at length. It is expected that testimony in the company's case will be concluded at the next hearing. The city will then be heard.

Detroit Bonds Offered.—Kuhn, Loeb & Company, Hallgarten & Company, and Kidder, Peabody & Company, New York, N. Y., are offering $14,500,000 of the city of Detroit's 4½ per cent and 5 per cent bonds. Included in this amount is $1,000,000 of 4½ per cent public utility bonds (street railway). These are coupon bonds dated Jan. 15 and July 15 and mature Jan. 15, 1932. The principal and interest are payable semi-annually in New York City or in Detroit. These "street railway" bonds are offered at 100¾ to yield approximately 4.40 per cent.

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Traffic and Transportation

Subway Crowding Must End

New York Commission Apparently Prepared to Insist on Adoption of Its Own Standards of Service Irrespective of the Results Upon the Company Financially

The New York Transit Commission and the Interborough Rapid Transit Company are at the parting of the ways. At least the differences between them seemed to be irreconcilable at the termination of the hearing on March 15. The commission appears to be determined to require from the company a fuller measure of service than is now being given, while the company insists that it can only carry on successfully and avoid receivership by further indulgence from the commission. The members of the commission finally declined to adjourn the hearing on the traffic conditions for thirty days.

COUNSEL for the commission thought that body had been very tolerant, as tolerant as it could be, taking into consideration the public interest and all the other interests. The time had come, however, when a different policy must inevitably be considered by the commission. Recognizing that fact the commission, Mr. Shearn said, had done two things:

1. It had prepared a plan that would give relief and that would enable decent service to be given to the public, and at the same time take care of every dollar of real value that there was in these properties.

2. Contemplating the possibility that the companies were going to flout the commission's plan and disregard its tolerant attitude in the past, the commission proposed to exert its police power and require better service.

Mr. Shearn said the companies must face that situation and every day's delay spelled a continuance of indecent conditions.

Mr. Quackenbush, counsel for the company, entered a plea at the outset for the commission to let the matter stand over for a period of thirty days. He believed that the officers of the company would then know and be able to state to the commission whether they could reach any agreement with the Manhattan Elevated Railway with regard to securing modifications of the terms of the lease under which that property is operated by the Interborough. If the officers could be free for the next three weeks they would probably be able to do a great deal more that in a way would be helpful to the public than they could do if they were obliged to suspend all other things and take up the question of schedules and other intricate matters involved in rearranging the service.

Mr. Quackenbush said that he knew that he had made a pretty long speech but he felt he should state the thing thoroughly so that the commission would get the company's point of view about the matter. He said:

> I will say to the commission as I have said to the Manhattan people, the Interborough Rapid Transit Company cannot under a 5-cent fare and existing conditions continue to pay the rental at the rate of 7 per cent. We hope that some ajdustment can be made that will enable us to go on. If the Manhattan Company should not see it that way or there should be no basis available for a compromise, then I should expect to say to Judge Mayer at the adjourned day as I would say to the commission, we can't go any further and we will have to face the inevitable.

Mr. Quackenbush then said that it was not reasonable to expect the Interborough to become familiar in so short a time with the valuation figures prepared by the commission. He called attention that the reports of the commission indicated that the deficit for the six months ended Dec. 31 was $1,937,000, compared with a deficit for the six months ended Dec. 31, 1920, of $2,682,000, and for the same six months of 1919 $1,900,000. He explained that the deficit for the last six months of last year was about the same as two years ago and about $682,000 less than in 1919. This gain, he said, had been made because the employees consented last July to accept a 10 per cent reduction.

Commission Counsel Wants Guarantees

Mr. Quackenbush assured the commission that he and President Hedley were anxious to co-operate in giving the public all the service possible, with the reservation that the company did not want to extend this service to the extent of forcing the company into a receivership.

Mr. Shearn asked Mr. Quackenbush if his company would guarantee that if it got the requested adjournment the service on the subways would be increased to the point attained in 1916, and Mr. Quackenbush replied that the question was a pretty big one. He did not know, he said, what were the standards of six years ago. Then Mr. Quackenbush said:

> My disposition is not litigation. My disposition is candor. And if this commission will at any time make an order that is beyond our power to carry out, of course I shall take it into the Appellate Division and ask to set it aside. That is the best answer I can make. I cannot translate your inquiry into terms of money. We lay the whole facts before you. You can tell what this corporation can do just as well as I can.
>
> I cannot underwrite the financial ability of the future, tomorrow or two weeks or thirty days from today of the Interborough Rapid Transit Company. It is in a perilous condition. I have made no concealment of it. The light seemed to be breaking a little for it. But if it escapes a receivership I think it will be due to the indulgence of this commission about as much as anything else. And, of course, any order of the character that you mention, Judge Shearn, would mean a receivership.

Mr. Shearn said that he asked the question, not that he expected any different answer, but to make it clear that the commission was really at the parting of the ways with the company in giving it further time in which to wrestle with the receivership problem. He then said:

> The whole matter, as I see it, comes down to this. We are dealing not with a matter of a threatened receivership, but with the obligations of the Interborough Rapid Transit Company under its contract.

There was some controversy over the authority of the commission to exercise both its police power and its power over the company's contract with the city. Mr. Quackenbush said that if the powers were mixed he would ask the courts for a review of the matter. He insisted that if the commission intended to issue orders that would force the company into a receivership, it should so act as to leave an open path for the company into the courts, where a demand could be made for a review. In illustration of what he meant Mr. Quackenbush said:

> I say, if the commission makes an order of the character which is indicated, I shall immediately cite the case of the International Railway in Buffalo, where the Court of Appeals said that you cannot make an order that disregards the financial ability of the corporation to carry it out. That illustrates what I mean.

Mr. Quackenbush said that whatever crisis existed in the transit situation several months ago had disappeared as soon as the holiday rush was over and conditions were no worse than three months ago, when there was no cry for increased service. He admitted that the service should be improved. Mr. Shearn, summing up the position of the commission, said that it was not concerned in the negotiations between the Interborough and the Manhattan companies, but that "the commission was concerned with the attitude of both companies with respect to its plan."

Service Reported to Be Suspended in Augusta

According to the New York *Evening Sun* of March 16 all electric cars in Augusta were withdrawn from service on that day by the Augusta-Aiken Railway & Electric Corporation as a protest against the neglect of the City Council to regulate jitneys. According to the newspaper report, the company had announced that its cars would remain in the carhouse indefinitely until the matter was settled.

A telegram to the management of the company in Augusta for confirmation of the report resulted in the suggestion that information could be secured from the J. G. White Management Corporation in New York, operators of the Augusta property. Inquiry at the office of that company, however, elicited the statement that the company was unaware whether the service had been suspended in Augusta or not.

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One-Man Car and Denial of Bus Permits Approved

The committee appointed by Mayor Hackett of Albany, N. Y., to investigate the service rendered by the United Traction Company and to offer suggestions for its improvement has submitted its report. The Mayor made no comment on the report other than that he would probably recommend at the next session of the City Council that the provisions of the report be carried out.

Much of the report deals with the subject of the one-man car which the committee says it was at first opposed to, but after a very careful investigation it believes that the one-man car is here to stay and that "we should endeavor to co-operate with the traction company management to get a maximum of efficiency from this service." The committee expressed the opinion that with the one-man cars the United Traction Company could pay a fair wage to its employees and make a reasonable return to its stockholders on a 5-cent fare. The committee went further and said that Mr. Weatherwax had said that it was the plan of the company to reduce the fare gradually until it gets back to the 5-cent fare.

The committee favored no further permits for the operation of buses because it was of the opinion that bus operation interfered with the operation of the electric railway cars. Accordingly, numerous parking orders and restrictions were recommended.

Some further provisions were outlined on an increase in service such as through cars to carry West Albany workmen. Patrons of the United Traction Company were urged to purchase tokens. In concluding its statement the committee urged co-operation by the public and recognized the traction company's efforts to give the citizens of Albany a satisfactory service.

Higher Court Rules Against Increased Rates

The Ohio Traction Company is barred from increasing fares from Wyoming, Ohio, to the Zoological Garden from 5 to 7 cents for adults and from 3 to 3½ cents for children, in an opinion handed down by the Ohio Supreme Court. The case was taken to the Supreme Court by Attorney Henry B. Street, Solicitor of Wyoming, through the Court of Appeals from the Court of Common Pleas of Hamilton County in which a decision was rendered in favor of the traction company.

The contention raised by Attorney Street against the suit filed by the traction company was that a franchise contract was still in force between Wyoming and the Ohio Traction Company, signed in March, 1900, and valid for twenty-five years. The franchise provides for a 10-cent fare from Wyoming into Cincinnati and a 5-cent fare from Wyoming to the Zoological Garden.

The issue upon which the traction company based its prosecution was a franchise entered into between it and the city of Cincinnati, one clause of which provided that the same rate should be charged by traction lines entering the city as those operating within the city. The Ohio Traction Company therefore sought to raise the 5-cent fare to one nearly equal to that of the Cincinnati Traction Company operating within Cincinnati. The Cincinnati Traction Company is a subsidiary of the Ohio Traction Company. The Supreme Court decided that the franchise contract existing between Wyoming and the Ohio Traction Company was complete in itself and could not be affected by any extraneous contract.

One-Man Cars Approved

One-man cars, as developed and operated by the Washington Railway & Electric Company, Washington, D. C., are to the interest of safety and economy, in the opinion of the Public Utilities Commission of the District of Columbia. The attitude of the commission was made known in the findings of the rate case of the Washington Railway & Electric Company and the Capital Traction Company. The commission's finding approves the recent devices used, as a conspicuous handle for opening each of the doors when released in emergency and two extra lights over the doorways which are lighted when the doors are opened. The order for the ventilation of cars is based upon that which would be adequate for a lightly loaded car, with a provision for further ventilation as required. Temperature of the cars, between Nov. 1, and April 1, shall not fall below 40 degrees F.

Petition Reduction in Salt Lake City

A petition for a reduction of the fares charged by the Utah Light & Traction Company, Salt Lake City, to the pre-war scale, has been presented to the Public Utilities Commission. The cash fare has been raised from 5 cents to 7 cents, the commutation ticket from 4 to 6¼ cents and students tickets from 3 to 4 cents since 1917.

The petition states that the commission held these increases justified on the ground that all materials, such as ties, steel rail, equipment and copper, as well as wages, had increased in price until they had become abnormally high.

It further points out that during the past year there has been a decided falling off in the prices of all commodities; ties have dropped in price from 25 to 40 per cent; steel rails from 10 to 25 per cent; copper wire from 25 to 50 per cent, and there has been a general reduction in the cost of all materials used by the company. On May 1, 1921, the wages of the employees of the company were cut 10 to 16 per cent, at a saving to the company of at least $120,000 per annum the petition concludes.

Davenport Mayor Wants Five-Cent Fare

Mayor C. L. Barewald of Davenport, Ia., candidate for re-election on the democratic ticket, announced recently that he would work for a 5-cent fare if re-elected. The present fare in Davenport is 8 cents. Mayor Barewald announced that he does not favor the monthly identification plan offered by the Tri-City Railway. By this card plan the passenger pays 50 cents a month for a card and then pays a nickel cash fare. The passenger who does not have a card pays a straight 10-cent fare. Four tokens may also be purchased for 35 cents or a fare of 8¾ cents a ride.

This card plan went into effect on March 1 on the lines of the Tri-City Railway in Illinois, serving the towns of Rock Island and Moline. President B. J. Denman of the company reports that it is working well there and states that the sale both of identification cards and of tokens has gone beyond expectations.

City Restrained

Little Rock city officials have been restrained from putting into effect an ordinance recently passed reducing the fare there to 5 cents by an order issued by Federal Judge Jacob Trieber. The order preserves the status quo in the suit of the Little Rock Railway & Electric Company against the city, asking temporary injunction against the enforcement of the ordinance. The order is effective until March 27 when a hearing on the company's application for the injunction will be held. Meanwhile the company will continue to collect the 6-cent fare. Under the order attorneys for both sides are required to furnish the opposing side with copies of all schedules and data to be submitted at the hearing. Judge Trieber announced that if the injunction is granted it will be under the terms that the company will be required to issue 1-cent certificates for each 6-cent fare paid, the certificates to be redeemable in the event a permanent injunction is denied.

Wants Lower Fares.—As a part of the fight in Fort Worth, Tex., for reduced electric railway fares, petitions have been presented to the Mayor and City Commissioners asking that the city ordinance prohibiting the operation of jitney buses within the business district be rescinded and that the car fare be reduced from 7 cents to 5 cents for adults and from 3½ cents to 3 cents for children and students. The situation in Fort Worth has remained in statu quo awaiting final decision in the Galveston street car fare case, which has been taken before the Supreme Court of the United States, and it has been announced that the city will do all in its power to force a reduction in fares, but that no action can be taken until the Galveston case is decided.

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Circuit Court of Appeals Hears Louisville Dispute

The dispute between the city of Louisville, Ky., and the Louisville Railway over the company's action in raising the fare from 5 to 7 cents had the attention of the United States Circuit Court of Appeals at the opening of the March session of that tribunal at Cincinnati, Ohio. The side of the city was presented and argued by Joseph S. Lawton and that of the company by Churchill Humphrey. The case was submitted for decision. It is before the court on the appeal by the city against the injunction granted by Judge Evans of the Louisville Federal Court stopping the city authorities from passing legislation to compel the traction company to reinstate the 5-cent fare. Attempt was made months ago to have the Supreme Court pass upon some questions bearing on the dispute, but the court refused to intervene and the decision was left to the United States Circuit Court of Appeals.

City Asks for Rate Rehearing

A petition has been filed by the city and county of Denver asking for a rehearing of the rate case of the Denver (Col.) Tramway recently decided by the United States Circuit Court of Appeals of the eighth district at St. Louis, Mo. Denver's right to contract through franchise is insisted upon and the court is urged to withdraw its decision which sustained the finding of the Federal District Court of Colorado and which is the authority of the receiver of the Denver Tramway for the collection of the present 8-cent fare.

In their opening arguments the attorneys for the city frankly state there are some broad expressions in the opinion of the Circuit Court of Appeals in this case which are so far reaching in effect that they not only would nullify the fare provisions in the franchises in the instant case but which rulings would seriously affect other franchises now in force in Denver and other parts of the state and seriously interfere with the making of franchise contracts in the future.

Court Decision Helps Railway

The Supreme Court of New Jersey has handed down a decision affecting the operation of jitneys within the state which is of importance to Public Service Corporation of New Jersey.

The Legislature of 1921 passed an act placing jitneys under the jurisdiction of the Public Utilities Commission, but made an exception of those licensed prior to March 15, 1921. The Public Utilities Commission assumed the position that under the act it had no power to prevent the transfer of jitney licenses granted prior to March 15, 1921. The Public Service Corporation of New Jersey took exception to this position and appealed to the Supreme Court. In a decision rendered recently the court overruled this contention and said the transfer of a jitney license is practically an application for a new license and should the jitney be considered unnecessary the license can be refused.

The jitney owners have been selling their licenses indiscriminately and purchasers claimed the privilege to operate under them and that the commission could not prevent it, no matter whether the jitney was necessary or not. It is not known at present just what percentage of jitneys will be affected by the decision, but it is believed to be quite a substantial number.

Seeks Increased Rates

The Jersey Central Traction Company, Keyport, N. J., has asked the Board of Public Utility Commissioners for permission to increase the fare from 7 to 10 cents. The company in its petition claims that it is operating at a loss, the deficit for last year being $120,000, according to Superintendent William H. Hitchcock. Mr. Hitchcock says that if the increase is not granted the matter of deciding whether cars will be run will be left in the hands of the executive offices of the company. The company operates from Perth Amboy to Red Bank and Highland Beach and to maintain its tracks alone is a great cost. At the present time the company is facing the problem of locating the tracks on Broadway, Keyport, and relocating the tracks on the bridge over the Raritan river between South and Perth Amboy. The company will also have to make other improvements that will cost enormous sums. The traction company was allowed by the commission to increase its fare on two occasions until it reached 7 cents.

Transportation News Notes

Freight Rates Cut.—The Buffalo & Lake Erie Traction Company, operating between Buffalo, N. Y., and Erie, Pa., has filed notices of 50 per cent cuts in freight rates on everything transported with the exception of bread, milk and newspapers.

Loading Time Cut in Half.—Time for loading passengers has been cut in half by the Georgia Railway & Power Company by means of street collectors stationed at the front end of cars. This double collection of fares in the downtown section made it possible for passengers to enter at both front and rear. Safety zones have been marked off in the congested district with ropes and wooden standards, and automobiles, as a result, can pass cars while passengers are boarding them.

Increased Fares Refused.—As a result of a rehearing granted the Westchester (N. Y.) Street Railway with respect to a fare increase, the Public Service Commission has denied the application of Leverett S. Miller, receiver for the property. The present rates were fixed by the commission's order of April 7, 1921. In handing down the opinion Commissioner Semple said that although the revenues produced no fair return upon the company's investment, still they carried the operating expenses and up-keep as well as taxes with a trifle over.

Elevated Line for Brooklyn.—An elevated line, instead of a subway will be constructed for 2½ miles in Brooklyn, N. Y., from McKibben Street, near Bushwick Avenue, to a connection with the existing Brooklyn Rapid Transit elevated railroads at East New York. This follows a vote by the Transit Commission. Commissioner Harkness said that bids would be called for at once. The new line will relieve congestion at Canal Street and Broadway, Manhattan, by providing a route from that station in connection with the Canarsie line of the Brooklyn Rapid Transit.

Token Carriers for Sale.—A new token-carrier is going to be put out by the Connecticut Company, New Haven, Conn., which ought to do away with one of the main objections to the tokens, namely, the difficulty in handling and carrying them. This device, which is only an inch and a half long, holds ten tokens, five in each end, and the tokens, which are always in sight, are ejected one at a time by a slight pressure of the thumb. They are easily refilled. The company has not announced how it will sell the containers, but it is understood that they will cost only 5 cents.

Syracuse Fare Hearing Postponed.—The hearing of the complaint of the city of Syracuse, N. Y., against the New York State Railways on the one-man car operation and the 8-cent fare will be continued before the Public Service Commission on March 31. Evidence submitted by the company showed a net saving in operations from the one-man cars of $70,758 from March 24, 1921, to Feb. 1, 1922. Savings for the present calendar year the company estimated would be $107,758. Evidence was also submitted showing one-man cars were 93.2 per cent on time, while the two-man cars were 91.9 per cent on time.

May Prepare Lower Fare Ordinance.—The City Council of Pine Bluff, Ark., has appointed a committee of three aldermen to confer with officials of the Pine Bluff Company, looking to the reduction of fares. The present fare is 7 cents, while books of fifty tickets are sold for $3. It is stated that an ordinance will be prepared and adopted, compelling the local company to reduce fares. The ordinance has been scheduled for presentation to the City Council on March 20. The 7-cent fare went into effect here during the period of the war. The Council believes that fuel and operating costs have been reduced sufficiently for cheaper fares to be put into effect.

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Personal Mention

Employees Made Directors

Two New Members Elected to Philadelphia Board to Further Plan for Employee Co-operation

John W. McElroy and Dr. A. A. Mitten were elected directors of the Philadelphia (Pa.) Rapid Transit Company at the annual meeting on March 15 to represent the employees. Their election puts into effect one of the ideas of management and men toward which President Thomas E. Mitten of the company has steadily been working since he took hold of the property in 1911.

It was quite logical under the plan of employee co-operation with the management that eventually employees representing the rank and file should sit on the board and that these two men should be elected to the directorate. Mr. McElroy is president of the Co-operative Welfare Association and Dr. Mitten is secretary of that body.

It may be true that Mr. McElroy expressed great surprise to the daily newspaper men after the meeting on March 15 that he had been elected, but it seems quite unlikely. Mr. McElroy is a modest, retiring man, and the truth would seem to be that these qualities in him, of which there was unmistakable evidence in his talk with the representatives of the ELECRTIC RAILROAD JOURNAL by whom he was interviewed, were taken by the daily newspaper men to mean an expression of surprise. He has been with the company since 1913 and is at present a yard man. He was born in Philadelphia forty-five years ago. He was educated in the public schools there and at the age of thirteen went to work in the mines as a breaker boy. Later he worked for the Newton Coal Company in Philadelphia.

As a new employee of the company Mr. McElroy entered at once heartily into the work of the Co-operative Association and has been a representative of the way department with the association since April, 1919. In 1920, 1921 and 1922 he was on the general committee of the association representing the way department and is a trustee and member of the organizing body of the Co-operative Welfare Association Saving Fund. He was elected president of the Co-operative Welfare Association in January, 1922. In this last capacity he helped to draw up the by-laws of the savings fund. The employees collectively own more than 30,000 shares of stock and the savings fund of the employees contains $1,000,000 of Philadelphia Rapid Transit bonds and car trusts. Mr. McElroy will be the responsible spokesman along with Dr. Mitten on the board of directors for the men owning these securities and will be held to accountability by them. He knows the men and their problems from close contact and thus will be able to reflect by his action on the board their hopes and aspirations.

Dr. Mitten is the only son of President Mitten. He is thirty-three years old. He was educated as a physician and surgeon and attained great proficiency as a hospital surgeon. He entered the electric railway industry as an industrial surgeon in Milwaukee in 1915. He served as captain of an ambulance company in France, was twice gassed, was wounded and then captured in August, 1918. Dr. Mitten was imprisoned at Villingen until the armistice. He is the understudy of President Mitten in co-operative welfare work. He has a particularly keen appreciation of the problems of the employees on account of his intimate contact with the men and as a result of his service abroad, where he gave unstintingly the best that was in him to his fellow men engaged in the struggle for military supremacy.

Promotions Announced by Virginia Company

The Virginia Railway & Power Company, Richmond, Va., has announced that beginning March 1, Herman Pollard, superintendent of schedules and inspections, assumed the duties of superintendent of transportation. He also has general supervision over all car operations. H. L. Smith, formerly superintendent of the Richmond Division, is now superintendent in charge of operation of cars from the Reservoir carhouse and in charge also of employees of the Reservoir terminal office. W. F. Bryce, who has been superintendent of the South Richmond and Interurban Divisions, has been placed in charge of operation of cars from the South Richmond carhouse and also in charge of the Seventh and Perry Streets terminal office employees.

J. M. Penick, engineer of maintenance of way, has been made chief engineer of railways, and in addition to his former work has general supervision over carhouses and shops.

Other changes in the personnel of the railway are as follows: W. J. Hicks is now master mechanic and J. F. Pond, superintendent of the Petersburg city lines.

Claus Spreckels Is Manager

Claus Spreckels, son of John D. Spreckels of the Spreckels transportation companies, has been made general manager of the San Diego Electric Railway, Point Loma Railway and San Diego & Coronado Ferries Company. William Clayton, who has been the managing director of the transportation companies under the control of the Spreckels, has retired.

C. S. Banghart Honored

General Manager of Augusta-Aiken Railway Nominated for President of Rotary Club

The many friends of Charles S. Banghart will not be surprised to learn that his executive ability and attractive personal qualities have already been recognized by his fellow citizens in Augusta, although it was only two years ago that he went there to become general manager of the Augusta-Aiken Railway & Electric Corporation. The nominating committee of the Rotary Club of that city has placed his name at the head of its ticket for officers for the coming year.

In commenting on this fact the Augusta *Chronicle* in a recent issue in its column, "Talking it Over," said:

> That is fine that Charlie Banghart is to be president of the Rotary Club for the next term of office. His nomination was announced yesterday, and the nomination is really the election.
>
> Than Mr. Banghart no man who has come to Augusta to make his home has made more friends. He is held in the highest and most cordial esteem by everyone who knows him. He is a man of the highest order of ability, thorough in his line, a hard fighter and a fair fighter for the interests he represents, and kindly and courteous at all times and in all things.

The Weekly Letter of the club for March 5 said in part:

> Although the head of the largest concern in Augusta employing strictly manpower, Charlie has always been democratic. He has always been approachable. He has never lost his sense of fun even in the most annoying moments of the railway controversy.

Some time ago Mr. Banghart talked on the traction situation before the Kiwanis Club, answering ten questions or charges sent to him in advance by interested persons. These questions were not easy ones and placed the burden of proof upon the company, but Mr. Banghart was convincing in his answers. The questions were as follows:

> It is said the Augusta-Aiken line is bonded for $6,200,000. Is it not more than the property is worth?
>
> Is not the Augusta-Aiken trying to pay dividends on watered stock?
>
> Why didn't the Augusta-Aiken run its tracks into the camp and buy more cars when it had an opportunity to increase its earnings?
>
> Why is the Augusta-Aiken asking an increase in power rate, when commodities are coming down?
>
> Why is it the Augusta-Aiken runs old, dirty, dilapidated noisy cars, operates on poor schedules, and charges a higher fare than is charged in Savannah or Atlanta?
>
> It is said the Augusta-Aiken cares nothing about the welfare of Augusta—only what they can get out of it.!
>
> Why did the Augusta-Aiken ignore Council and the Railway Commission and take its case to the Federal Court?
>
> Why should not the Augusta-Aiken put its wires under ground? Is it not a contract with the city?
>
> The Augusta-Aiken will not move its tracks on Walton Way, or the Hill!
>
> The Augusta-Aiken pays large salaries to men in New York who do no work!

Mr. Banghart was made general manager of the Augusta-Aiken Company in 1919. From 1914 until that time he served as vice-president and general manager of the Binghamton, (N. Y.) Railway. He is a graduate of Lehigh University and has been connected with the Interstate Railway, Reading, Pa., and the New York & Queens County Railway, Long Island City, N. Y.

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General Bancroft Dead

To Him Much Credit Is Due for the Model System Which Boston Now Enjoys

General William A. Bancroft, lawyer, former Mayor of Cambridge, Mass., and first president of the Boston Elevated Railway, died on March 11 at his home in Cambridge. He was sixty-seven years old.

General Bancroft assumed the duties of president of the elevated at its inception in 1899. Under him none of the functions of the company as a transportation agency was neglected. With the program of physical extension carried forward under him there also went forward the work of building up the personnel and of cultivating public good will. Thus the Boston Elevated was one of the first companies to raise its standards for men seeking employment. Discipline was also strictly enforced, a reflection no doubt of the military training of the General himself. The humanitarian side was not neglected, however, for the Boston company was one of the first to adopt the pension plan and to award bonuses at Christmas.

As for the physical side General Bancroft took hold of a system that at the end of 1898 contained 316 miles of track, collected 181,321,295 fares and issued about 28,239 free transfers. Ten years later the system comprised 474.45 miles of track, over which 273,132,584 passengers were carried. The number of free transfers, under the provisions of law, increased by about 500 per cent in ten years. In 1916, when the general retired as president to become chairman of the board, the company carried 363,477,041 passengers, but the transfer burden had become unbearable.

General Bancroft's connection with the street railways at Boston began in 1885, when he was chosen to the superintendency of the Cambridge Railroad. When the Cambridge roads were merged in the West End Street Railway combination General Bancroft was made roadmaster of the entire system. He took part in the electrification of the lines, which was begun in 1889.

In 1892 General Bancroft left the railway business temporarily. His occupancy, however, of the mayoralty chair in Cambridge in the years 1893-96 was no interruption in his preparation for important public service work. He was a member of the Cambridge Common Council in 1882, of the Massachusetts Legislature in 1883-85 and was president of the Cambridge Board of Aldermen, 1891-92. He was a graduate of Harvard and captain and stroke oarsman of the victorious Harvard University crews of the years 1877, 1878 and 1879.

Service in the militia up to the time of and through the Spanish war must be accounted as an important part of the training which General Bancroft has undergone. He started as a private in the Massachusetts volunteer militia in 1875 and ended as a major general on the retired list in 1901.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

San Francisco Calls for Bids on Light-Weight Municipal Cars

As announced in the rolling stock columns of the ELECTRIC RAILWAY JOURNAL for Feb. 11, the San Francisco Municipal Railway has issued specifications and a call for bids, to be opened March 29, on twenty to thirty new light-weight cars for the Union Street line. These will be single-truck, semi-steel, double-end, center-entrance and center-exit cars of a design practically the same as the experimental car which was built especially for the Union Street line and described in the ELECTRIC RAILWAY JOURNAL, Jan. 29, 1921, page 229. If the bids received are low the order is to be placed for the maximum number of cars, but if prices are considered high only twenty are to be purchased at this time.

The specifications are issued in four parts, being devoted to bodies, trucks, motors and air brakes respectively. Trucks, motors and air brakes are to be delivered to the body builder, where the cars are to be completely assembled so they can be shipped practically ready for service. Delivery of the first fifteen cars is to be made at San Francisco 160 days after the contract is awarded and the remainder are to be delivered within sixty days thereafter.

Some of the main features of the specifications are as follows:

Length of car over bumpers	29 ft. 10 in.
Maximum width of car over window sill	8 ft. 8½ in.
Height from top of rail to top of trolley board	10 ft. ⅜ in.
Truck wheel base	12 ft. 0 in.
Diameter of wheels (steel)	26 in.
Seating capacity, number of persons	32
Number of motors	2
Horsepower of motors, one-hour rating	50
Scheduled speed, including stops, miles per hour	10
Minimum center radius of horizontal curves over which cars will be required to operate	40 ft.
Minimum radius of vertical curves over which cars will be required to operate	276 ft. 0 in
Approximate weight of car body, including all equipment attached thereto but without passengers	14,500 lb.
Approximate weight of truck including wheels and axles, exclusive of motors	7,500 lb.
Approximate weight of motors, 2,100 lb. each	4,200 lb.
Approximate weight of complete car empty	26,200 lb.

The San Francisco city engineer's office also has in course of preparation and expects to issue some time in April specifications for twenty cars of standard size and weight for use on the several new extensions to the Municipal Railway which are now planned.

Progress is being made on the several proposed extensions of the Municipal Railway. The Duboce Avenue line into the Sunset District has been approved by the Board of Supervisors and the city engineer has been authorized to prepare details of an assessment district. The specifications for the Taraval Street line will be issued, it is expected, some time in March. Some of the material for the Masonic Avenue extension has been purchased.

Big Power Developments in the South

Many of the principal cities of North Carolina, South Carolina, Georgia and Alabama and in eastern Kentucky and Tennessee are now served by an interconnected power supply which rivals in territory served the proposed superpower district of the Northeastern Atlantic States. It extends from Nashville, Tenn., on the west to Goldsboro, N. C., on the east. Much new electric power equipment also is going into these and contiguous states. A list of some of the larger recent orders or additions to company equipment follows:

Southern Power Company	140,000 kw. hydro-electric
Alabama Power Company	60,000 kw. hydro-electric
Georgia Railway & Power Company	50,000 kw. hydro-electric
Alabama Power Company*	40,000 kw. steam
New Orleans Railway & Light Company	20,000 kw. steam
Smaller installations (aggregate)	40,000 kw. steam
Total	350,000 kw.

*This includes steam equipment at Warrior taken over from U. S. Government the early part of this year and installed during the war.

Indiana Service Corporation Operates New Substation

The Indiana Service Corporation of Fort Wayne, Ind., has put into operation its new substation at the corner of Webster and Melita Streets, Fort Wayne. When completed with all feeder lines and special switches the cost will be in the neighborhood of $130,000. The station is a one-story fireproof type of construction, laid out so that additions can be conveniently taken care of if wanted. The capacity of the rotaries used is 1,500 kw.

Metal, Coal and Material Prices

Metals—New York	March 14, 1922
Copper, electrolytic, cents per lb.	12.875
Copper wire base, cents per lb.	14.125
Lead, cents per lb.	4.70
Zinc, cents per lb.	5.037
Tin Straits, cents per lb.	28.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.60
Somerset mine run, Boston, net tons	1.875
Pittsburgh, mine run, Pittsburgh, net tons	2.15
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.90
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	1.94
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	94.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	88.00

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Rolling Stock

Boston (Mass.) Elevated Railway expects to purchase 100 new surface cars during 1922.

Brockton & Plymouth Street Railway, Plymouth, Mass., expects to buy two standard Birney safety cars.

Houston (Tex.) Electric Company plans to purchase thirty-five new cars immediately. The total cost will be $270,000.

Louisville (Ky.) Railway has purchased 309 power-saving meters equipped with the car inspection dials from the Economy Electric Devices Company, for use on its city and interurban cars.

Atlantic & Suburban Railway, Pleasantville, N. J., has placed an order for new cars with the J. G. Brill Company, Philadelphia. These are to operate between Atlantic City and Somers Point. They will be of the pay-as-you-enter type.

Track and Roadway

City Railway, Dayton, Ohio, during 1922 will build 7,000 ft. of single track. All the material for the work is on the ground.

Carolina Power & Light Company, Raleigh, N. C., expects to build during the next few months 837 ft. of new track.

Pacific Electric Railway, Los Angeles, Cal., has received permission to construct a spur track railway across the north half of Philadelphia Street near Gregory Avenue in the City of Whittier.

Ottawa (Canada) Electric Railway during 1921 laid new rails on Wellington Street and on Somerset Street between Bank and Bay Streets. The new St. Patrick bridge was opened for traffic and the company's service resumed through to New Edinburgh.

Jamestown (N. Y.) Street Railway has petitioned the Common Council for permission to double track Prendergast and Spring Streets, between Third and Second Streets. It intends running cars on a loop system basis with the old Lyric Theater Building to be a terminal.

North Carolina Public Service Company, Greensboro, N. C., will maintain double car tracks on South Elm Street and will extend the double tracks on North Elm to the intersection of Church and Bellemeade Streets. The City Council recently approved of this improvement.

Birmingham Railway Light & Power Company, Birmingham, Ala., will put in operation about Jan. 15 the Norwood car line extension. This new extension around the Norwood Boulevard to Thirty-Second Street and Fifteenth Avenue is approximately a half mile long and will cost $40,000 according to officials of the Birmingham Realty Company, which is financing the extension. Grading work has been completed and ties have been laid for that portion of the line on Norwood Boulevard. This extension has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

Power Houses, Shops and Buildings

Brockton & Plymouth Street Railway, Plymouth, Mass., will purchase one 300-kw., 600-volt direct current converter.

Colorado Springs & Interurban Railway, Colorado Springs, Col., is building an extension to its office, 21 ft. x 75 ft. The cost is estimated at $3,000.

The East Bay Division of the Pacific Gas & Electric Company, Sacramento, Cal., is to have a new office building in Oakland at Seventeenth and Clay Streets. It will be ready, according to present plans, before the end of 1922.

New Orleans Railway & Light Company is installing a 20,000-kw. turbogenerator in its Market Street power plant. A surface condenser of 33,000 sq.ft. will go with the auxiliary pumping and piping equipment. The work is being done by the Dwight P. Robinson & Company organization.

Boston (Mass.) Elevated Railway will purchase within the next few weeks two boilers for installation at the South Boston power station; build an addition to the boiler room at the South Boston power station, build a new inspection shop for elevated cars at Forest Hills, and at a later date will start work on the consolidated shops at Everett.

Franchises

Northern Texas Traction Company, Fort Worth, Tex., has been granted a francise by the City Commission for extending a new line from Hemphill along Bowie Street to South Adams and thence south to Shaw Street. The new line will serve a densely populated portion of the Tenth Ward hitherto without service.

New Incorporation

Electric Railway Finance Corporation, London, Eng., has been registered with a capital of £500,000. It has a very influential directorate and first subscribers take a large part of shares. The company expects to carry out financial and commercial operations of every description, to carry on iron, coal and engineering business, to act as railway contractors, to manufacture railway materials and rolling stock and electrical apparatus and machinery.

Trade Notes

Service Motor Truck Company, Wabash, Ind., has announced the appointment of John D. Ristine as manager of sales in the Railroad Division.

Economy Electric Devices Company, Chicago, Ill., has designed a graphic form for use in plotting operating, statistical and engineering data. The company announces that immediate shipment can be made on this form.

The Car Turnstile Company, business offices at 383 West Fayette Street, Syracuse, N. Y., has been organized to market the Syracuse Car Turnstile system of controlling the operation of rear-entrance front-exit one-man cars introduced in Syracuse some time ago and described in the issue of Jan. 28. William H. Lawyer is president of the new corporation, and Albert C. Coon is secretary. It is reported that electric railway men from various cities have visited Syracuse to observe the system in operation.

Combustion Utilities Corporation, New York, N. Y., was organized at the first of the year, with headquarters at 60 Wall street. The company is composed of an old organization of Henry L. Doherty & Company, and the Industrial Heating Department. This latter organization grew out of the old Toledo Railway & Light Company, Toledo, Ohio. The new company will market what it calls fuel service, that is, it will analyze the customer's requirements, advise as to the proper fuel and furnace equipment, and after the installation, service engineers will work to gain the best results.

New Advertising Literature

Schweitzer & Conrad, Inc., Chicago, Ill., has issued Bulletin No. 105-A descriptive of its high voltage detector.

Henry Wells Oil Company, London, England, has issued a third edition of a booklet entitled "Germ Process Motoils." This gives information regarding lubrication tests and other data of the company's oils.

The Uehling Instrument Company, New York, has just issued Bulletins Nos. 220 and 221, on combustion economies, which are the first of a series to be issued dealing with combustion and the cost of power. Bulletin No. 220 treats of the magnitude of the power plant chimney loss and gives a table showing the heat carried away by the chimney gases per pound of combustible. Bulletin 221 gives the relation between CO_2 and the money wasted up the chimney. Tables and graphs are included showing the per cent lost up the chimney for solid and liquid fuel and for gaseous fuel and examples are given in fuel saving, resulting from increasing the amount of CO_2.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MacMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, March 25, 1922 — *Number* 12

The New York Valuations

ON THE resumption of the valuation hearings by the New York Transit Commission on March 20, the companies, in starting to present their side of the case, their opinion and evidence, very properly protested against the commission accepting the recommendations of its own valuation bureau. It will be recalled that on Feb. 20, when these hearings opened with the bureau's testimony—and then adjourned to be reopened March 20—four sets of figures were presented and one of these recommended, *i.e.*, that based on estimated original cost. Comment as to the significance of this valuation and recommendation was made in these columns in the issue of Feb. 25. Suffice it to repeat that these figures are testimony only—proper and necessary as a part of the complete picture—but they are testimony only. A fifth figure is yet to be presented, based on the future earning capacity of each of the roads upon the basis of the 5-cent fare and present conditions of management.

It is of no use to enter upon an academic discussion of the basis or theory of valuation—the rule is pretty clear by this time. Smith vs. Ames is still controlling. The United States Supreme Court has named as some of the things to consider:

> The original cost of construction,
> The amount expended in permanent improvements,
> The amount and market value of its bonds and stock,
> The present as compared with the original cost of construction,
> The probable earning capacity of the property under particular rates prescribed by statutes.

It is to be expected, therefore, that the commission in determining value will consider Mr. Madden's figures merely as evidence. It would be a peculiar and anomalous position for the city or state to take, after the companies have been struggling along under increased prices of operation for a number of years on the theory held by the city that it is not responsible for increased cost, but that the whole burden must be borne by the companies, that appraisals should be based primarily on prices of many years ago. A basis adapted for operating expenses ought to be a good basis for costs or value in any appraisal of physical property.

Some of the companies in their arguments are presenting figures for consideration on a basis which is somewhat analogous to "historical cost." In some cases these figures are the lump sum capital expenditures made in order to produce the present systems. There is much to support historical cost as a very weighty piece of evidence, and the fact that many of these expenditures were made with the full knowledge and official sanction of the public's commissions then in power should tend to give them more weight than ordinarily in determining fair values. These values exceed those recommended by Mr. Madden, but in general are less than Mr. Madden's estimate of reproduction cost on the basis of present day prices.

Other figures yet to be presented are those on the estimated future earning basis with a 5-cent fare, and some of the companies claim that these will show a much higher figure. The reason for this is that under their original franchises, granted to individual companies, the ride possible for a single 5-cent fare was comparatively short, and it has been only through consolidations during the last thirty years that the ride possible for the 5-cent fare has been lengthened in many cases. Any such basis of valuation also should presuppose intelligent co-operation in the way of traffic regulation, etc., by the city authorities, at least to the extent that such co-operation is being afforded in other large cities in the country. As the commission's consulting engineer, Mr. Turner, has pointed out, the operating expenses per car-mile of all the surface lines in Manhattan Borough are close to 60 cents. This is much too high and due very largely to the low speed of the cars, which is less than 7 revenue car-miles per car-hour. With an increase in this figure of from 40 to 50 per cent, the appraisal figures on the basis of a 5-cent fare ought to be considerably higher than those on the so-called "original cost."

When the evidence is all in, the commission must then tackle what the Supreme Court of the United States calls the "embarrassing question" of reaching a conclusion as to "fair value." Actually, and properly, the controlling factor, if it follows leading commission decisions in fact, rather than in theory, will be that value which will make it possible for the railways to continue in successful operation, to furnish satisfactory service to the public at a fair price. This is the "value" for them to determine.

What Are the Requirements of the Best Kind of Electric Railway?

AN ANSWER to this question must be given by three arbitrators as a result of hearings now being conducted in Toronto to determine the amount to be paid by the city of Toronto to the railway company there as recompense for the property which the city took over last September. This measure for determining the value of a railway system is a unique one. Usually the method followed in the United States is reproduction value on some basis of unit cost prices. There is no constitutional provision in either Canada or England corresponding to the one in this country by which private property cannot be taken without compensation, but the Toronto case is not affected by that fact.

The words quoted in part above defining the basis of settlement in the Toronto franchise read in full as follows:

> In arriving at such value, the arbitrators are to consider and award only the value of the said several particulars to the city at the time of arbitration, having regard to the requirements of a railway of the best kind and system then in operation and applicable to the said city.

These words form part of the contract under which the company thirty-one years ago agreed to sell its property to the city, and there seems to be no reason

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why the question should not come up in the United States in similar circumstances.

Obviously, the purpose of the original contract was that the property should be valued on a service standard; that is to say, the cars and rails were not to be taken over either at their second-hand value or at their original cost, but at an intermediate price, depending on their usefulness. But in the determination of this value, was the equipment to be compared with that of a high-grade electric railway of about the same size elsewhere, or do the words mean that the Toronto equipment taken over is to be compared with an ideal property, with all its physical property brand new? If the former is the case, it is natural to assume that the older equipment of the Toronto company or the greater part of it must be valued at a fairly high service standard, because a very large proportion of the equipment of every large electric railway company, even of "the best" electric railway companies, is obsolescent if not actually obsolete. On the other hand, if the words mean that everything has to be judged on the basis of what absolutely new or practically new equipment would do, the present Toronto equipment would have a much less value.

It is easy to see that other queries might easily arise in the settlement of this question. For instance, if the second theory should prevail, whose opinion should be selected as to what is the best type of cars and rails to use in a city the size of Toronto? On this point the opinions of experts even for the same property would differ widely.

Altogether the conclusions of the arbitrators on the meaning of these words promise to be of interest, even if there is no similar question in other pending valuations for which they could serve as a precedent.

Development of the One-Man Car Is Going Forward

A YEAR or so ago, if any one had read a paper proposing a design of one-man cars different from the so-called standard safety car, there would have been a vigorous defense of the standard design and serious objection raised to any change. At that time, there were many who realized that if the one-man car was to be used under certain traffic conditions, a change in the so-called standard would be desirable, but any suggestion along the line met with decided opposition—even ridicule. The editors of this paper were urged to give less space to views on changes in one-man car design and were criticised when they pointed out that while the standard form had many advantages the field of the one-man car might be greatly extended by a car with double doors and a little more generous dimensioning.

During the past twelve months or so there has been a notable change in this attitude. First, there was the development of the double-door one-man car in Madison, an account of which was published in this paper a year ago this month. Then came the double-door car in Baltimore, a full account of which was made public last September. Then came the two types of safety cars developed for use on the Chicago Surface Lines; then the turnstile cars, described by Mr. Sweet at the New York State convention and in use in Syracuse and Utica; and most recently the Connecticut Company double-truck cars described in the Feb. 18 issue of this paper. The order here cited is simply that in which information about these cars was made public, not necessarily the order in which the cars actually were developed. At first, these variations from a standard type of car aroused the same kind of opposition which was mentioned earlier in this editorial, but there must now be a feeling that variations are inevitable. The paper by H. H. Adams at the Illinois convention last week elicited at that meeting no comment but commendation of this effort to design a car to suit a particular set of needs.

There is a proverb that hope springs eternal in the human breast, and when the Birney car was developed and its use spread to many cities operating under various conditions of traffic, there was undoubtedly some ground for the belief that a universal car had finally been evolved or at least a car which would be suitable for perhaps 60 to 70 per cent of all surface city traffic. This meant a realization of the long held ideal that cars could be built for stock and, so to say, could be produced in quantity and sold "off the shelf" like so many standard bolts or cans of vegetables. Naturally this would, or should, bring about a material reduction in manufacturing costs over the special car. Hence there was the strong effort to establish standardization along the lines of this car and the consequent disappointment when variations began. Incidentally, some railway men felt that the promised saving in cost, due to the one design, had not been fully realized.

Actually, the cause for these variations was not that the Birney car was not adapted to a great many conditions. The cause was, rather, that it was almost, if not quite, an impossible task to design any one car which would be best adapted for all conditions of electric railway service, including various lengths of passenger ride, varying extents of passenger interchange, different rates of acceleration desired, habits of people, etc.

Mr. Birney's great contribution to the industry was not the design of a car about 28 ft. long, 8 ft. wide and seating thirty-two passengers. Instead, it was first the establishment on a large scale of the important fact that with a suitable car, equipped with the proper time-saving and other appliances, a single operator was able to perform the functions of both motorman and conductor under widely varying conditions of traffic. In the second place, he turned the tide against the long heavy car and convinced the industry of the economies of light weight, of the resulting skip-stop effect of the small load and of the traffic advantages of short headway.

Much as the fact is to be regretted from the standpoint of cost, the hope of a standard car for all conditions must be given up by those who held it. This does not prevent, however, much progress along the lines of car standardization. The extent to which the original Birney car has been found to be adaptable to different classes of service should be an object lesson in the future. There should not now be the same desire for slight variations which affect the cost of construction. As long ago as 1915 this paper pointed out that a great saving in car costs would follow the general adoption of standard spacings between sideposts, standard window sizes, standard contour of roof, one or two standard widths and three or four standard lengths. Such standardization would bring about a material reduction in manufacturing costs over the special car, perhaps to almost the same extent as would a standard car itself.

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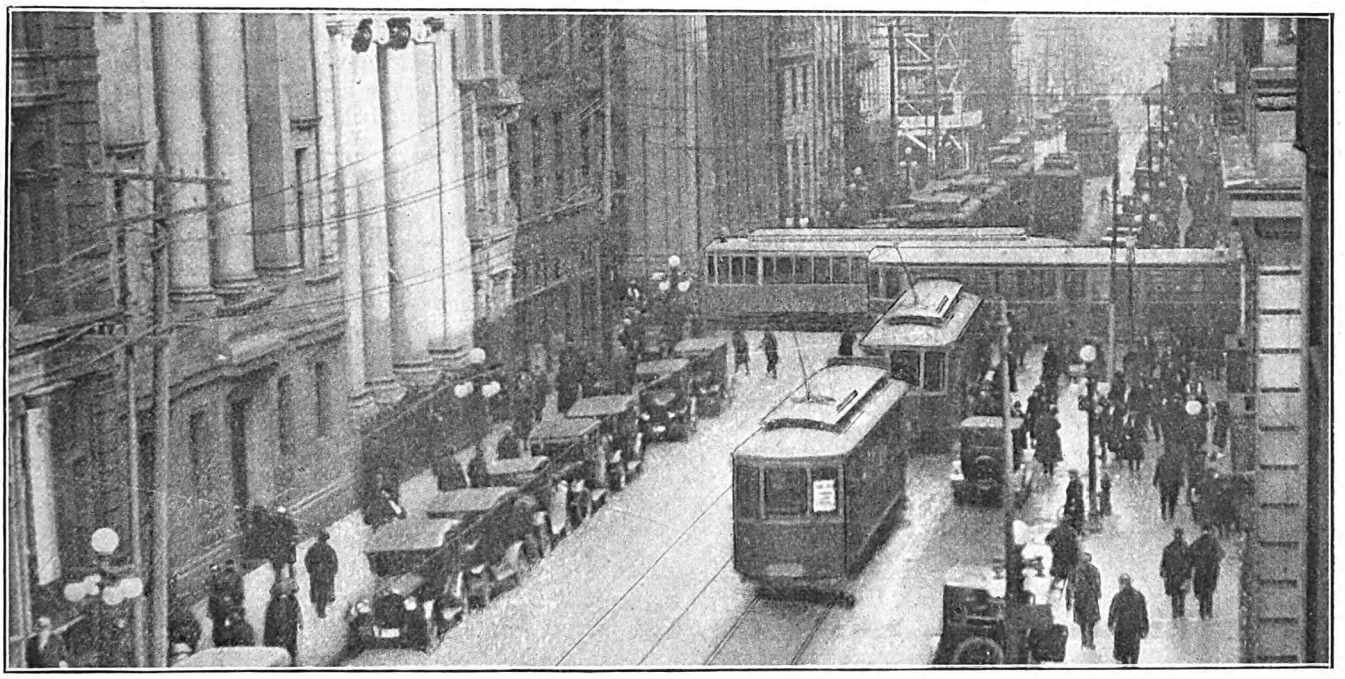
Toronto Takes Over Street Railways

Assumed Possession of System in September, 1921, When Thirty-Year Franchise of Private Company Expired—City Has Now Largest Municipal Railway in North America and Is Spending Eleven Million Dollars for Immediate Rehabilitation and Extensions—Construction of Terms in Original Franchise in Regard to Payment for Property Taken Over Now Being Considered by Arbitration Board



LOOKING EAST ON KING STREET AT YONGE STREET, FEB. 18, 1922, AT 12:45 P.M. THIS SHOWS A TYPICAL CONDITION DURING A SATURDAY NOON RUSH HOUR

WHEN the city of Toronto in September last took over the property of the Toronto Railway it acquired a system which, at least in number of cars owned, is larger than that of any other municipal railway in North America. The Toronto Railway operated about 143 miles of track and 830 cars. In addition to this property the city owns what are known as the Toronto Civic Lines. The construction of these lines was commenced by the city about ten years ago and since then they have been operated by the municipality. They comprise about 22 miles of track with seventy cars and have been combined with the property taken over from the Toronto Railway. The city has also taken over and is now operating the city portion of the Scarboro division of the Toronto & York Radial Railway, 1.87 miles in length. Further, the city plans to take over soon and operate in conjunction with its present system the portions within the city limits of the several remaining radial or interurban lines built or operated by private interests. Table I shows mileage of track and cars taken over from the Toronto Railway and those belonging to the Civic Railway.

Exclusive of the 20 miles or so of track in the yards, the mileage comprised in the entire system, including the portions of the Radial Lines to be taken over, will be approximately 179 miles. On the basis of about 530,000 inhabitants in the city proper, this gives Toronto a mile of track for every 3,000 resident population. Including the immediately adjacent communities, the population of the city amounts to about 575,000, exclusive of a floating population of about 10,000. At present about 950 cars are operated at the maximum rush-hour peak. During the middle of the day the service calls for 390 cars, with headways of about four minutes on the different lines. In addition to street car service, the city is now operating two motor bus routes with seven gasoline buses, and expects soon to augment this service with four more gasoline buses and four trolley buses. The revenue passengers per day average 550,000.

TABLE I—SHOWING MILES OF TRACK AND CARS BELONGING TO THE PRESENT TORONTO SYSTEM

	Toronto Railway	Civic Railway	Added Since Sept. 1, 1921	Total o Feb. 1.
Miles of single track:				
In streets	132.99	21.09	7.25	161.33
In carhouses	9.83	1.26	6.61	17.70
Cars				
Double-truck pay-as-you-pass	.....	....	190	190
Double-truck trailers	.....	.....	60	60
Old double-truck closed	475	37	....	512
Old single-truck closed	234	33	....	267
Old single-truck trailers	121	.....	....	121
Service cars	50	3	4	57
Carhouses	5*	3	....	8
Shops	1	.....	....	1
Substations	5	4	1	10

* In addition to the five carhouses belonging to the Toronto Railway taken over by the city, the company had a small frame carhouse which it still owns.

During the latter part of its franchise the company had no inducement to put new equipment in service because there was no guarantee that it would be taken over by the city at what the company considered fair value. In consequence there was a reduction in the service as shown in Table II.

A brief account follows of the events which preceded and led up to the acquisition of the property of the Toronto Railway by the city. This account will show that history repeats itself in Toronto as elsewhere.

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TABLE II—SHOWING REVENUE PASSENGERS AND OPERATING EXPENSES PER CAR-MILE YEAR ENDED JUNE 30
Reference Ontario Railway and Municipal Board

	1915	1920
Passengers	6.53	9.03
Expenses (cents)	15.42	30.58

When the Toronto Railway gave up its railway system in September, 1921, it did just what an earlier company had done thirty years previously at the expiration of its thirty-year franchise.

FIRST STREET RAILWAY IN 1861

The first street railway system in Toronto was established in 1861, when a franchise for thirty years was granted to Alexander Easton and others. Under this franchise the only payment made to the city was a license fee of $5 per car per year. Afterward, in 1889, a payment of $600 per annum for each mile of single track used by the company was made in consideration of the construction by the city of the pavement required in connection with the tracks and the maintenance of this paving. The rate of fare was 5 cents, and tickets were sold at six for 25 cents and twenty-five for $1, with school tickets at a reduced rate. No transfers were given and no night cars were run, and under city ordinance no cars were permitted in service on Sunday.

According to this franchise the city had the right to take over the property at the end of the franchise, but on its expiration on March 26, 1891, an extension of time was necessary because the arbitration proceedings had not advanced to admit the transfer being made. The city assumed possession on May 20, 1891, the amount of the award being $1,453,788, and it immediately advertised for bids for a new company on a thirty-year franchise. At that time the system was still being operated by horses.

Tenders were requested on four different bases as to fares, guarantee of company bonds, etc. Several tenders were received, and the franchise was finally awarded to a company made up of Henry A. Everett, who was then largely interested in the Cleveland Railway; William McKenzie, a large contractor in Toronto; George W. Kiely, who had been connected with the previous company, and others.

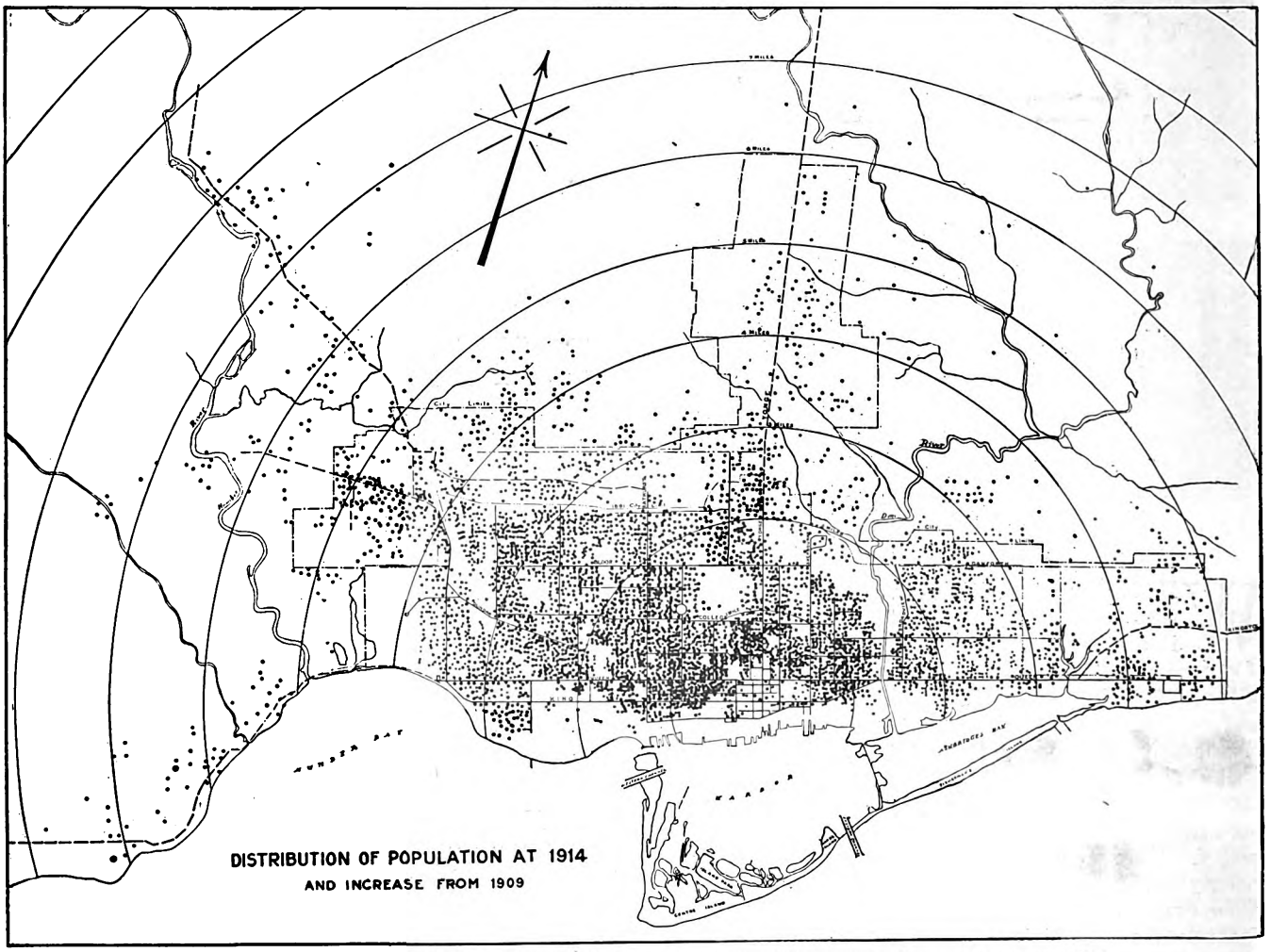

FIG. 1—DIAGRAM SHOWING DISTRIBUTION OF POPULATION IN AND AROUND THE CITY OF TORONTO, 1914. EACH DOT REPRESENTS 100 PEOPLE

The company took over the property from the city on Sept. 1, 1891. Some of the features of the franchise were as follows:

PRINCIPAL FEATURES OF FRANCHISE OF TORONTO RAILWAY

1. The company received the exclusive right and privilege of using and working street railways in Toronto during the continuance of the franchise, except on that portion of Yonge Street, north of the Ontario & Quebec Railway (now Canadian Pacific Railway), and that portion of Queen Street (Lake Shore Road) west of Dufferin Street. On these excepted portions of the city, the company was also entitled to privileges in so far as the city had the power to grant franchises for the full thirty-year period that did not interfere

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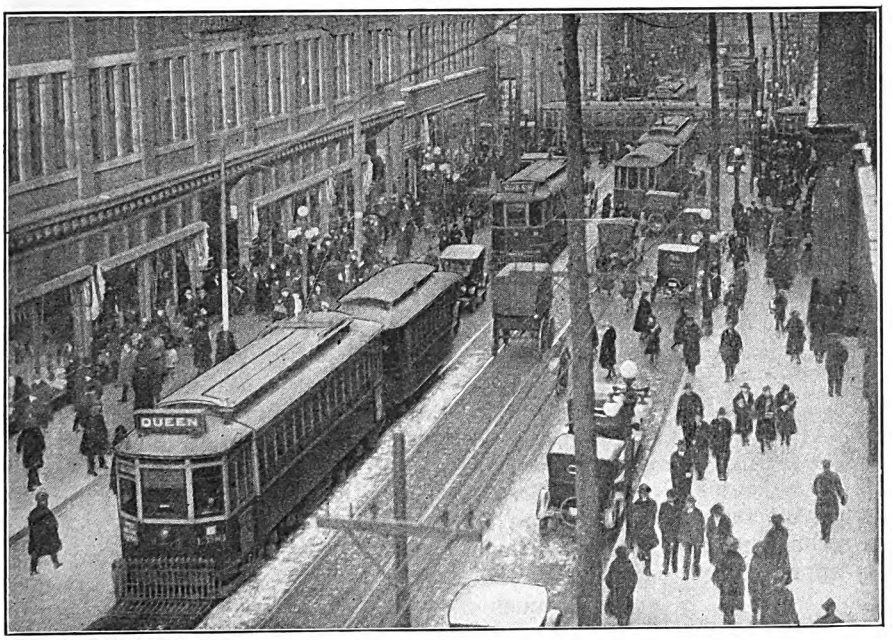

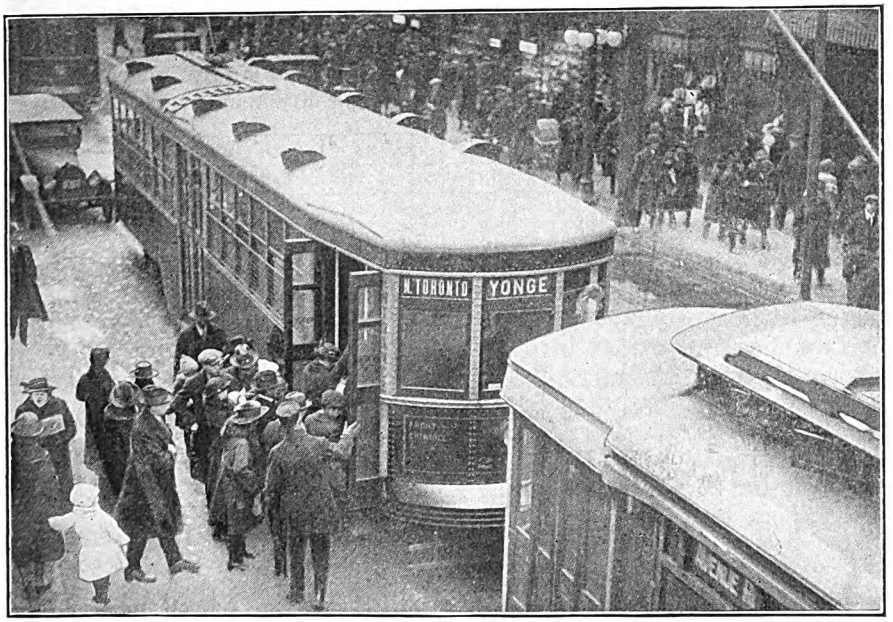

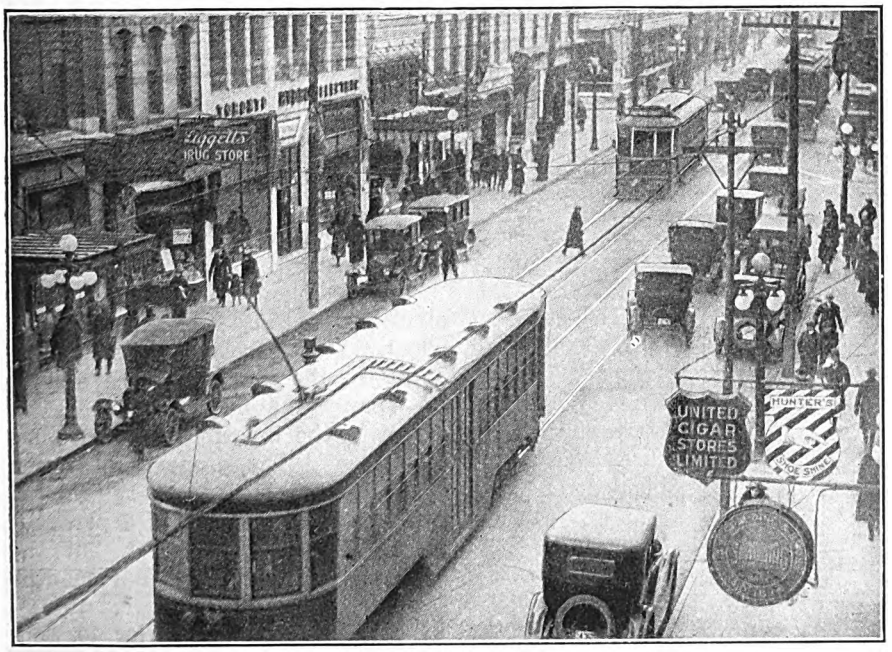

with the rights of existing street railway corporations on these streets.

2. If, at the end of the thirty-year franchise, the city desired to exercise the right of taking over the property necessary to be used in the working of the railways, at least twelve months notice must be given to the railway company to this effect. In case such notice was not given, the franchise became automatically extended from year to year. In this case, however, the city had to give only six months notice to the company of its intent to take over the property. If such notice was given, the franchise provided for an arbitration board to determine the value of the property. In such arbitration the franchise declared that the board must use as a measure of value "a railway of the best kind and system then in operation." The full wording of this clause follows:

> In determining such value, the rights and privileges granted by the said agreement and the revenue, profits and dividends being or likely to be derived from the enterprise are not to be taken into consideration, but the arbitrators are to consider only the actual value of the actual and tangible property, plant, equipments and works connected with and necessary to the operation of the railways, which is not to include any land, property or rights acquired or used in connection with the said street railway, and which do not actually form a part of the said street railway undertaking necessary to the carrying on of the same.
>
> In arriving at such value, the arbitrators are to consider and award only the value of the said several particulars to the city at the time of the arbitration, having regard to the requirements of a railway of the best kind and system then in operation and applicable to the said city.

3. The company was to pay for the construction of all track, i.e., rails, ties and fastenings, but the city was to pay for the cost and maintenance of all foundations and pavements and of all repairs to the same except those caused by the railway when it had to tear up paving to make repairs to its tracks. This has to be made good by the company. The company had to keep its tracks in a state of thorough efficiency and to the satisfaction of the engineer of the city, and to remove, renew, or replace the same as circumstances might require, and as the city engineer might direct.

TYPICAL VIEWS IN TORONTO

The upper view shows Queen Street at 5.15 p.m. Feb. 15; the one below Yonge Street at 1:10 p.m., Feb. 18 (Saturday); the lower view Yonge Street at 4:45 p.m., Feb. 16 with zero weather. The large number of autos should be noticed; yet with only 42-ft. wide roadways, the crossing at Yonge and Queen Streets carries 209 trains on Yonge and 104 on Queen during the maximum afternoon rush hour.

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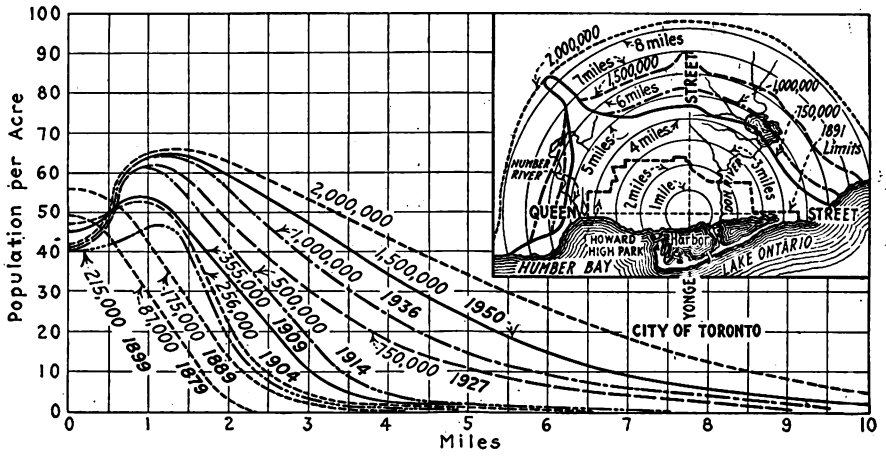

FIG. 2—COMPOSITE CURVES OF POPULATION DENSITY IN TORONTO

When streets were to be paved in a permanent manner by the city, the track also had to be reconstructed according to the best modern practice as approved by the city engineer.

4. The company was to pay the city $800 per year per mile of single track. (This figure was considered to be roughly in lieu of pavement charges paid by the city as outlined above.) The company was also to pay the city a percentage of its gross receipts as follows: Up to $1,000,000, 8 per cent; between $1,000,000 and $1,500,000, 10 per cent; between $1,500,000 and $2,000,000, 12 per cent; between $2,000,000 and $3,000,000, 15 per cent; on all gross receipts over $3,000,000, 20 per cent. (This payment was considered to be equivalent to a tax on its franchise, and the company was exempted from all other taxes except school and real estate taxes.)

5. Fares were to be as follows: Single fare, 5 cents, except between midnight and 5:30 a.m., when the fare was to be 10 cents. Tickets good at any time except on the late night cars, six for 25 cents and twenty-five for $1. Limited tickets, good between 5:30 a.m. and 8 a.m. and between 5 p.m. and 6:30 p.m. eight for 25 cents. School tickets, with the usual restrictions, ten for 25 cents. In addition to the above, free transfers had to be given.

6. The railway company agreed to build and equip a factory in the city for the manufacture and repair of all cars used on the railway during the life of the franchise.

7. A track gage of 4 ft. 10⅝ in. had to be maintained, and track grades had to conform to street grades.

8. The railway company was not permitted to extend beyond the then city limits without conforming to certain regulations, so that if the city should extend its territorial limits, these extensions would be governed by regulations similar to the main franchise, and the franchise for them would terminate on Aug. 31, 1921. All such extensions had also to be built as recommended by the city engineer and approved by the City Council. (The practical effect of this clause was that few extensions were made, and this prompted the construction by the city of the Civic Railway lines in 1910-11-12. It was the position of the company not only that it was under no obligations to go outside the city limits of 1891 but that it was not permitted to do so under the franchise. Litigation followed this statement of position, and the case was finally taken to the Privy Council in London, England, where the position of the company was sustained. Probably much of the prosperity of the company during the first twenty years of its franchise was due to the fact that its activities were confined to the highly congested central territory of Toronto.)

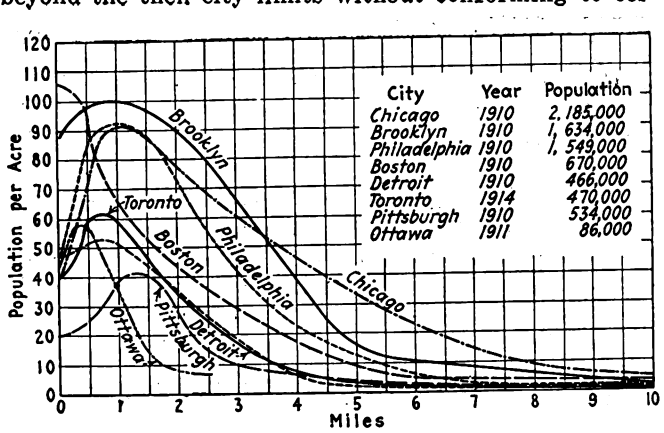

FIG. 3—CURVES SHOWING POPULATION DENSITIES OF VARIOUS CITIES

9. The railway could purchase land to operate pleasure resorts, but in case the city took over the railway in 1921 such lands or real estate would not be a part of the property acquired by the city.

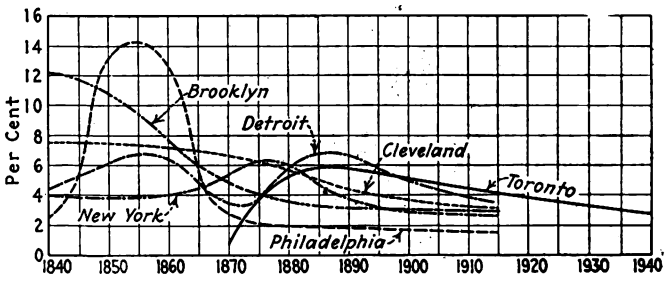

FIG. 4—CURVES SHOWING PERCENTAGE OF ANNUAL INCREASE OF POPULATION IN VARIOUS CITIES

10. Track allowances had to be kept free from snow and ice by the railway. In case the snow fell to more than 6 in. in depth, it had to be carted away at the expense of the railway.

11. Employees must not be required to work more than ten hours a day, or sixty hours a week, or six days a week, and no adult employee shall be paid less than 15 cents an hour.

12. Sunday cars were not permitted. (Sunday service began in 1897 under a supplementary agreement.)

ENTERPRISE AT FIRST SUCCESSFUL

In an interview with Mr. Everett in 1895, four years after the line was taken over by the new company, Mr. Everett said in part as follows:

"The cash capital of the Toronto Company paid in was $600,000, for which $6,000,000 worth of stock was issued. This is selling in the market at the end of three years for $75 (par value $100), which is an increase of $3,780,000 over the investment of $600,000 three and a half years ago. The property has been bonded for $2,800,000 in 4½ per cent, twenty-thirty year sinking fund bonds, which were sold on a 5 per cent basis. We have paid no dividends as yet, but the accrued profits for the three years and four months have been $629,000.

"The reduction of fares (over those prior to Sep-

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tember, 1891) has not affected the wages of our men. We are paying 16⅔ cents per hour, the same as before the reduction and 1⅔ cents more than the contract requirements in the city franchise. The hours are limited to ten hours per day and sixty hours per week, and these wages are fully equal to 20 cents an hour in the States.

"The total cost per car-mile run in the city of Toronto for the year 1894 was 8.33 cents, which included insurance, taxes, injuries, and damages, in addition to all operating expenses, not allowing, of course, for the 8 per cent of gross receipts."

At the beginning of the company's franchise the only taxes it was called upon to pay, in addition to the percentage on receipts and the pavement charge, were school taxes and the ordinary tax levied against the company's real estate, which were especially mentioned in the franchise. After several years, however, the city commenced to assess the company's rails, poles and wires. This assessment was protested by the company, but in 1897 the courts decided that the roads, poles and wires were real estate. At first the assessment was about $1,000 per mile of track, which was termed "scrap value," but in 1902 the assessment was increased to $6,300 per mile.

In spite of these facts the enterprise, on the whole, was prosperous until the great increase in the cost of labor and materials due to the war began to make inroads into the earnings of the company. In 1913, the year before the war, the gross income was more than $6,000,000 and represented an increase of 147 per cent during a decade, or an average of 14.7 per cent per year. In spite of the fact that 18 per cent of the gross earnings were being paid to the city under the agreement or in general taxes, the company showed a surplus after paying 8 per cent dividends of its stock and had no difficulty in issuing new stock at par to its stockholders. Its average operating ratio for the ten years ended with 1913 was 54.85 per cent. By 1920, however, the company was paying 60 cents maximum to its motormen and conductors, and while the gross earnings had increased to $7,909,891, the net balance from operation

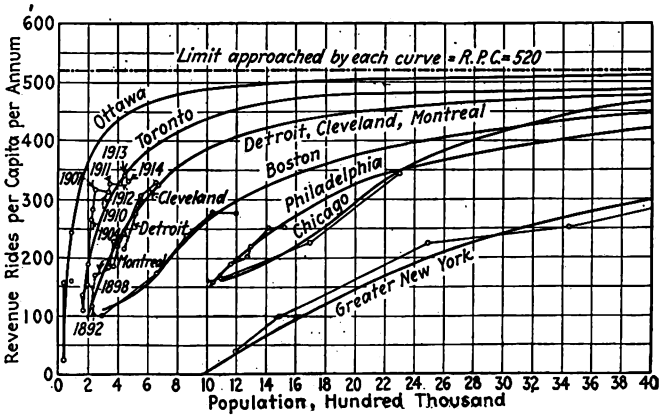

FIG. 5—CURVES SHOWING GROWTH OF RIDING HABIT IN VARIOUS CITIES

was only $1,283,383, and the payment to the city amounted to $1,559,868, or 121 per cent of the net balance. An accompanying table gives the financial and traffic data of the company.

STATISTICS OF TORONTO TRAFFIC

In 1915 the city authorized an extended inquiry into the transportation situation in and around Toronto in connection with the entrances into the city of the radial lines. The committee in charge of the inquiry consisted of R. C. Harris, Commissioner of Works; F. A. Gaby, chief engineer Hydro-Electric Power Commission of Ontario, and E. L. Cousins, chief engineer Toronto Harbor Commission. Among the conclusions reached by the committee was that the city should acquire the Toronto Railway at the expiration of the franchise in 1921, that a comprehensive program for street transportation development should be committed to a commission, consisting of representatives from the city, the Harbor Commission, and the Ontario Hydro-Electric Power Commission, and that a rapid transit system in the strict meaning of the term was not required at present in Toronto.

Many interesting data and charts were compiled

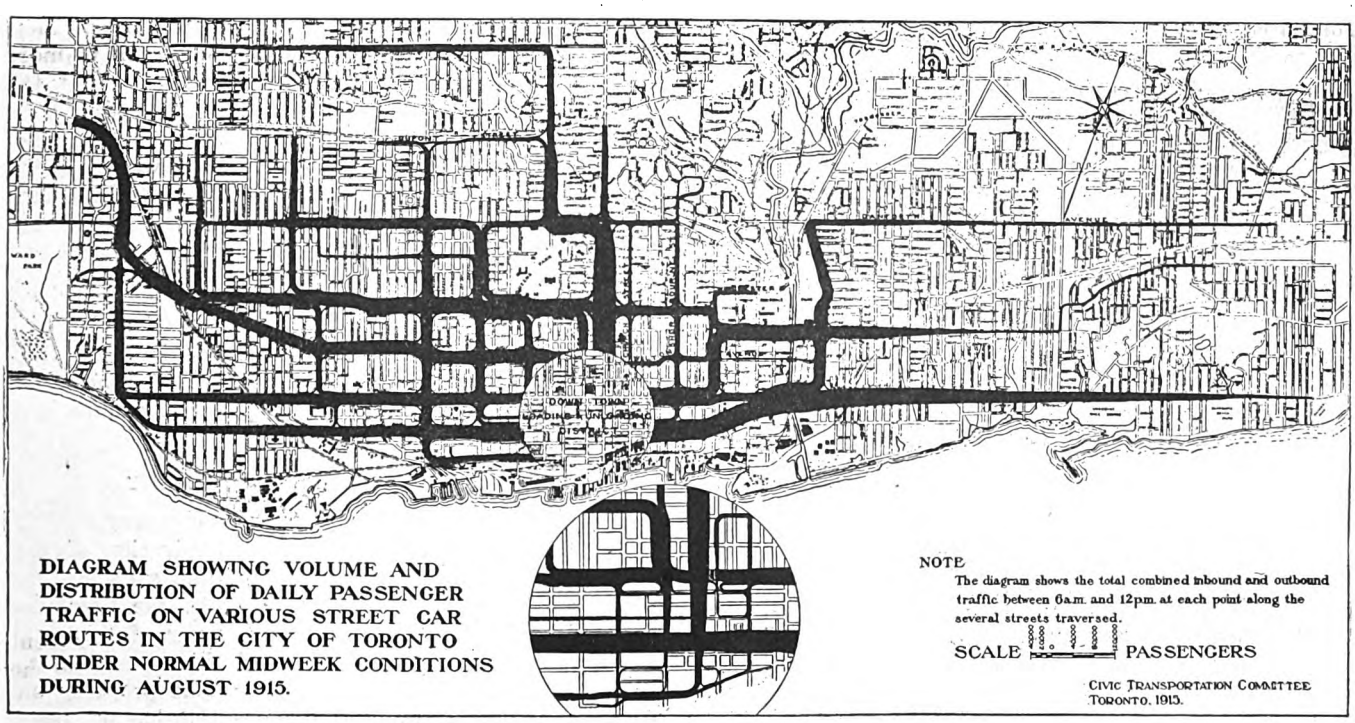

FIG. 6—DIAGRAM SHOWING VOLUME AND DISTRIBUTION OF STREET RAILWAY TRAFFIC IN TORONTO UNDER NORMAL MIDWEEK CONDITIONS DURING AUGUST, 1915

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showing distribution of population and traffic. Although for the most part these data relate to 1915, some of the most interesting charts are reproduced in this article as the latest available.

Fig. 1 shows the distribution of population in 1914, each dot representing 100 people. In the report of the commission this chart was one of a series in which changes in the distribution of population over the previous period were distinguished by the color of the dot. In 1914 the population within the city was 470,100 and that adjacent to the city 31,400.

Fig. 2 shows the population per acre in Toronto at different periods and in zones from the civic center of the city at the corner of Yonge and Queen Streets. The data given in this chart are predicated on the removal of the traffic barriers presented by the Humber River and the Don River. A similar chart (not shown) shows the same data in case these barriers are not broken. Fig. 3 shows the population per acre for Toronto as compared with other cities mentioned. Fig. 4 gives the percentage of annual increase in population of various cities. Fig. 5 gives the rides per capita in different cities, the curves for the higher populations being estimated. In its discussion of these estimates the commission points out that the so-called "law of squares," that is, that revenue rides increase as the square of the factor of the increase of population, can be applied only as an approximation to a city in its earlier periods of growth, and that the limit of rides per capita per annum under present transit conditions seems to be about 520. This theory has been followed in the chart reproduced.

Fig. 6 gives the approximate distribution of passenger traffic on various street railway routes in the city of Toronto under normal midweek conditions during August, 1915. The width of each route line is proportional to the combined inbound and outbound traffic between 6 a.m. and 12 p.m. at each point along the several streets traversed.

Fig. 7 shows by the colored area within the outside line the distribution of office and retail business district, heavy and light manufacturing and residential districts of Toronto, as estimated with a population of 1,500,000 people, assuming that the existing barriers presented by the rivers on each side of the city are broken by adequate means of transportation. In this map the municipal boundaries and built-up area of 1915 are shown within the outside line. The municipal boundaries of 1891 are also given.

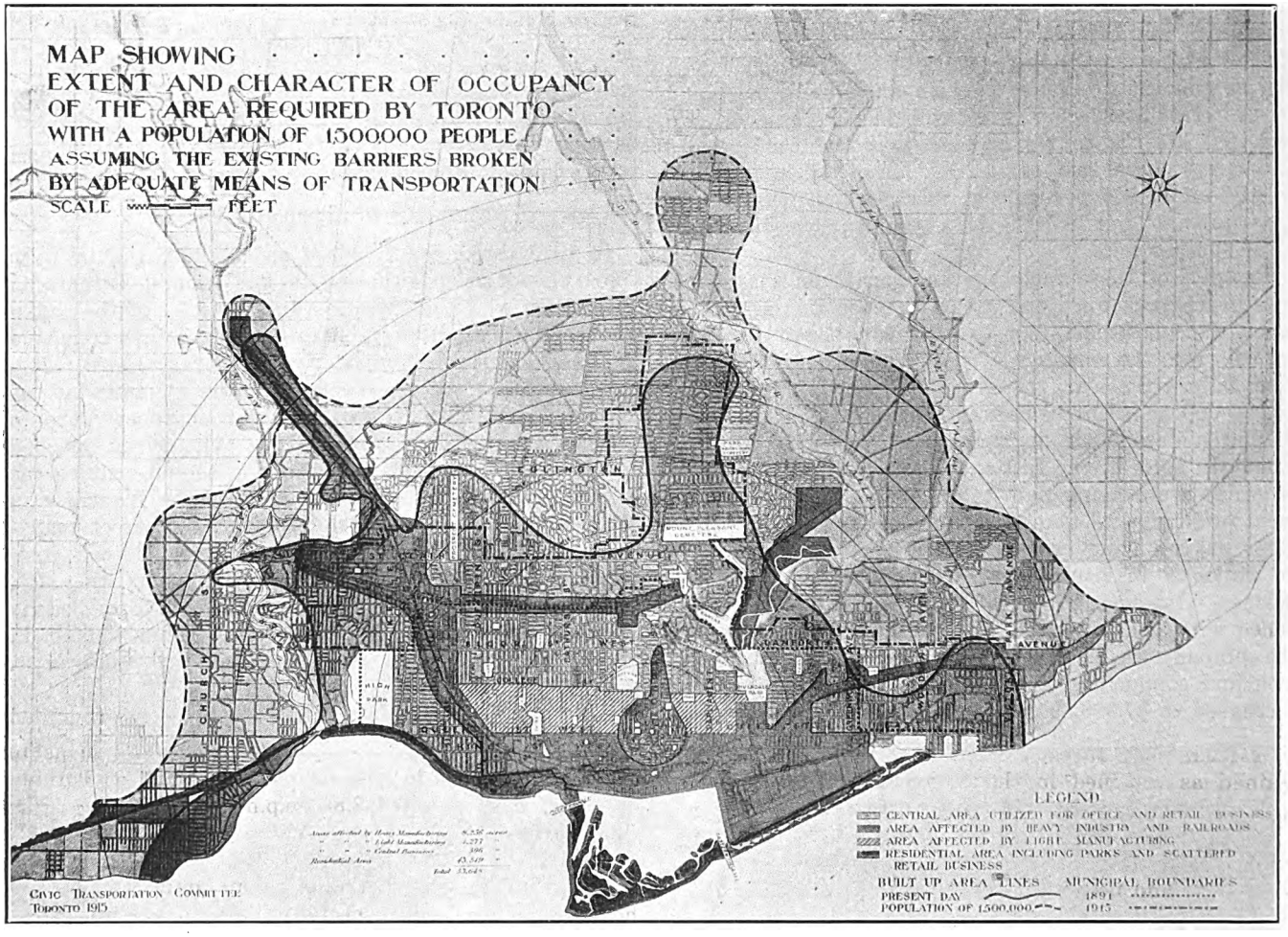

FIG. 7—MAP SHOWING EXTENT AND CHARACTER OF OCCUPANCY OF THE AREA REQUIRED BY TORONTO WITH A POPULATION OF 1,500,000 PEOPLE

CITY DECIDES TO PURCHASE PROPERTY

In August, 1920, the city notified the company that it would take over the property at the expiration of the franchise on Sept. 1, 1921, and appointed a committee to negotiate the purchase, consisting of the Commissioner of Public Works, the Commissioner of Finance, and the Corporation Counsel. Negotiations were begun, and while the city began operation of the property on Sept. 1, 1921, the question of compensation has not been settled, as the wording of the clause upon the basis for

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THE TORONTO RAILWAY COMPANY STATISTICAL STATEMENT FOR THE YEARS 1910 TO 1920

	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910
Gross income	$7,909,891	$7,234,895	$6,526,302	$6,291,759	$5,973,161	$5,694,136	$6,127,096	$6,049,018	$5,448,050	$4,851,541	$4,377,116
Operating, maintenance and other charges	$6,626,508	$5,655,658	$4,509,651	$3,815,277	$3,350,657	$3,250,611	$3,529,546	$3,123,308	$2,866,550	$2,653,361	$2,237,187
Net earnings	$1,283,383	$1,579,236	$2,016,651	$2,476,481	$2,622,503	$2,443,524	$2,597,550	$2,925,710	$2,581,500	$2,198,179	$2,139,928
Passengers carried	197,346,726	182,377,494	166,510,326	158,087,984	149,529,754	142,061,258	152,966,153	151,236,925	135,786,573	120,997,844	109,415,264
Transfers	77,911,713	70,446,128	63,176,397	62,301,636	61,342,763	62,398,638	65,778,022	63,083,118	56,176,985	48,730,671	42,630,756
Percentage of charges etc., to passenger earnings	84.2	79.5	71.7	61.5	57	57.9	58 4	52.2	53.4	55.2	51.6

this compensation is capable of several interpretations and is now being considered by an arbitration board. This board consists of Major Hume Cronyn of London, Ontario, chairman; Sir Adam Beck for the city, and Sir Thomas White for the company. Hearings were begun on Sept. 13, 1921, and the company, after sixty-four sessions, completed its presentation of the case on Jan. 27. Adjournment was ordered until March 14, when the city was to commence the presentation of its side of the case. The testimony has been printed in abstract from time to time in the news columns of this paper commencing with the issue of Sept. 24, 1921.

Municipal Operating Organization

The municipal operating organization is entirely separate from the committee appointed by the city to negotiate for the purchase of the property. It is known as the Transportation Commission and consists of P. W. Ellis, chairman; George Wright and R. R. Miller, commissioners with H. H. Couzens as general manager of the system. D. W. Harvey, who prior to the formation of the commission had charge of the Civic Railway lines, is assistant manager; A. T. Spencer is engineer-of-way, W. R. McRae is superintendent of rolling stock, J. W. Howden is superintendent of schedules, and J. McCulloch is traffic superintendent. Mr. Spencer came from Montreal, where he had long been associated with the Montreal Tramways Company, and the three officials last mentioned have been connected with the Toronto Railway. The act under which the Transportation Commission was appointed declares that the revenues from the property should pay the whole cost of the service.

This meant, of course, that the fares would have to be raised. The fares under company management remained as specified in the franchise. When the city took over the property the fares were raised to 7 cents cash with four tickets for 25 cents and fifty for $3, with a cash fare of 15 cents between midnight and 5:30 a.m., and no workmen's tickets. Children are still carried at half rates.

A novel method is followed in determining whether a child is entitled to ride at half rates. The criterion is not the age but the height of the child. A mark is painted at the car entrance and near the fare box 51 in. above the car floor. Any child shorter than that height can travel at the reduced fare. If taller than 51 in. full fare must be paid. The position of the mark is such that the conductor can see at a glance as a child enters the car whether it is over or under this limit.

Financial Arrangement

To take care of immediate improvements and provide part of the purchase price for the company, the city in 1921 issued $15,000,000 in serial thirty-year bonds, carrying interest at 6½ per cent. These bonds were sold to the public at about 102. One-third of this issue was sold in Canada, with principal and interest payable in Toronto, and two-thirds in the United States with principal and interest payable in either Toronto or New York, at the option of the holder. A sinking fund was established to begin in three years and to pay off entire bond issue in thirty years. The charges for sinking fund and interest amount to about $1,200,000 per year. The tax rate of the city in 1921 was $33 per thousand.

The budget of the commission for its 1921 program and covering both construction and rehabilitation was as follows:

Cars	$4,400,000
Trackless trolleys and other buses	200,000
Carhouses and shops, including tracks in same	1,900,000
Tracks on streets	4,500,000
Total	$11,000,000

One of the enlarged carhouses will have a storage capacity of 9,000 sq.ft., with eighteen tracks, and the other a storage capacity of 21,000 sq.ft. with twenty-six tracks.

The commission has extensive plans for improving the service in addition to physical improvements. One of these is to decrease the number of stops so as to increase the schedule speed, which, on the Toronto Railway, has averaged 8.84 m.p.h.

A careful traffic survey will also be conducted to determine whether there will be any gain in rerouting. Methods of ameliorating conditions during the rush hour will also receive especial attention. At present, it is estimated that 37 per cent of the business is done between 7:30 and 9 a.m. and 4:45 to 5:45 p.m. This is a 65 per cent increase since 1915, although the general traffic has increased only 35 per cent during those years. A traffic study department has been appointed to conduct special studies along these and similar lines.

ST. CLAIR AVENUE AT AVENUE ROAD, MAY, 1921, BEFORE LINE WAS TAKEN OVER, SHOWING QUEUE OF PASSENGERS TRANSFERRING BETWEEN TORONTO RAILWAY CARS AND CIVIC RAILWAY CARS. WITH THE CONSOLIDATION OF THE TWO SYSTEMS THIS CONDITION HAS BEEN ELIMINATED

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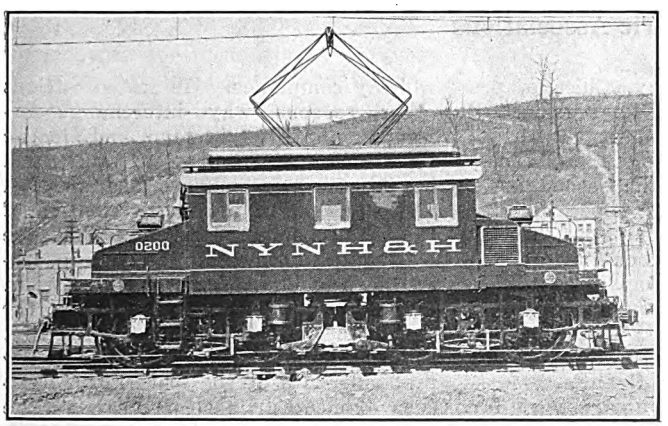
is used for transfer of freight on the New York, Westchester & Boston Railway and the remaining three are held at the shops for inspection or use at whatever point the service demands.

The three main electrically equipped yards on the



TYPE OF SINGLE-PHASE, 25-CYCLE, 11,000-VOLT SWITCHING LOCOMOTIVE ON THE NEW HAVEN

New Haven are the Oak Point yard, having a track length of about 37 miles, with a total of 35.5 miles electrified; the Harlem River yard, with 23 miles, and the Westchester yard, with about the same trackage as the Harlem River yard.

ELECTRIC SWITCHING IN THE OAK POINT YARD

The number of electric switching locomotives assigned to the Oak Point yard varies at times from five to seven, according to the amount of traffic to be handled. The locomotives in this yard are used in two different classes of service, four of them being assigned to what is known as "float yard" service, to unload eastbound cars from the floats and to load westbound cars on floats, and also to do whatever switching is necessary with the westbound cars.

The New Haven road has approximately sixteen tugboats with capacities ranging from 350 to 1,200 hp. each for transporting the freight cars between the terminals by floats, the floats having a carrying capacity of from twelve to twenty-two cars each. The fifth locomotive used in these yards takes the eastbound cars from the float yard to the classification yard and makes up the eastbound trains. In looking over the records one month was selected as a representative month, which showed an average of forty-three floats handled daily at the Oak Point yard. Using an average tonnage of 900 for the eastbound float loads, and 600 for the westbound, the four locomotives assigned to the float yards would handle approximately 16,000 tons each in a twenty-four-hour service. The locomotive working in the classification yards handles about 75 per cent of the eastbound cars received, the other 25 per cent being taken to the Westchester yards by the transfer engines. This would make the average daily tonnage for these locomotives approximately 18,000. In addition to loading and unloading the floats the four locomotives in the float yard do a certain amount of switching of westbound cars and various miscellaneous work in the yards. The figure of 18,000 tons, therefore, seems to be a very fair average tonnage for the locomotives working in this yard.

The monthly mileage made by several of these locomotives in switching service is between 4,300 and 4,500. The locomotives are kept in service twenty-four hours a day by using three eight-hour crew shifts, and after the completion of 2,500 miles they are sent to the Van Nest shops for a light inspection. A day force working eight hours is employed for locomotive inspection and the work is usually done at the rate of two locomotives per day.

A number of these electric locomotives have made records of twenty-four hours a day for thirty days without any interruption.

A French Experimental Gasoline Rail Car

The Tramway Company of the Department of Deux-Sèvres Has Recently Tried Out Successfully a Rail Bus Made from an Army Camion or Truck

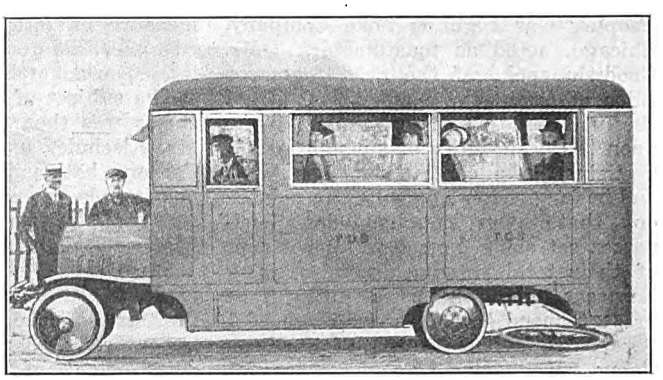
IN THE Feb. 4 issue of *le Génie Civil*, G. Tartary gives recent information regarding the gasoline rail car which he described in an article several months earlier in *l'Industrie des Tramways, Chemins de Fer et Transports Publics Automobiles*. The sample car is now making 125 miles per day, at a normal speed of 19 to 22 m.p.h., and operating on grades up to 3.5 and 4 per cent.

This car is being used by the Compagnie des Tramways des Deux-Sèvres in France. It was built by the company with the chassis of an 18-hp. war-time motor truck as a basis. The following are the characteristics of the vehicle:

Length of chassis	15 ft. 9 in.
Length of body	13 ft. 11 in.
Width of body	5 ft. 5 in.
Height of body	5 ft. 11 in.
Horsepower	18 to 20
Seating capacity	16
Standing capacity	4 to 8
Weight, without load	4,410 lb.

The gasoline consumption under the conditions mentioned earlier is 1 gal. for about 12 miles.

The wheelbase is 10 ft. 6 in., which is too great to permit the rounding of ordinary curves with a rigid mounting of the wheels. The former mounting with steering wheel connection was, therefore, retained, but with the addition of a spring centering device to provide a restoring force always tending to bring the wheels



TINY RAIL BUS THAT HAS MADE GOOD IN FRANCE

back to a tangent-track position. The deflecting force in curved track is provided by the reaction of the wheel flanges on the rails. To insure a smooth transition into and out of curves the driver uses the usual steering wheel, which, however, is provided with an indicator to show him the position of the flanged wheels.

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Illinois Associations Meet in Chicago

Advertising, Franchises, Car Design and Wood Preservation Occupy Attention of Electric Railway Men—Joint Sessions Held with the State Gas and Electric Associations

MEETING simultaneously with the Illinois Gas and Electric Associations, the Illinois Electric Railways Association held a convention in Chicago on March 15 and 16 with a good attendance. Joint meetings of the three associations were held both forenoons and a joint banquet on Wednesday evening. At the general session on the morning of March 15 John F. Gilchrist, Commonwealth Edison Company, Chicago, addressed the gathering on the need for co-operation on the part of the utility executives with the Illinois Committee on Public Utility Information, laying particular stress on the need for further work with the utility company employees in order that their far-reaching influence in the general program of informing the public may be secured. The splendid accomplishments of the Illinois Committee and how the utilities can co-operate with it to get the greatest good from its work was the subject of discussion by a number of utility men who followed Mr. Gilchrist.

The general session on Thursday morning was addressed by President Robert I. Todd of the American Electric Railway Association and R. B. Brown, vice-president American Gas Association. M. H. Aylesworth, executive secretary National Electric Light Association, spoke briefly of the recent investigations of the government-owned hydro-electric services in Canada and of the business promotion campaign which the association is about to undertake in a broad way.

W. L. Goodwin, assistant to the president Society for Electrical Development, was the only speaker at the evening banquet. B. J. Mullaney, People's Gas Light & Coke Company, Chicago, acted as toastmaster. Mr. Goodwin spoke of the need for more sales effort in the business of all of the utilities, laying particular stress upon the desirability of substantial advertising on a continuous sales basis and in far greater quantity. He pointed out that many merchandising businesses set aside from 5 to 10 per cent of their total revenue for advertising purposes, while the public utilities at present spend less than one-tenth of 1 per cent of their revenue for advertising. He referred to the drive for more and better business on the part of the N.E.L.A. and suggested a united drive of a similar nature on the part of all the public utilities.

Electric Railway Sessions

At the first separate session of the electric railway association President W. L. Arnold, treasurer Elgin & Belvidere Electric Company, Chicago, presided, while Second Vice-President R. A. Moore, general manager Aurora, Plainfield & Joliet Electric Railway, Joliet, Ill., presided the second afternoon. Following the paper by Mr. Moran on "Advertising the Electric Railway's Service," which appears elsewhere, the subject was discussed by Luke Grant, manager publicity department Chicago Elevated Railroads, and J. T. Downey, National Railway Advertising Company. Mr. Grant's remarks are given after the abstract of Mr. Moran's paper.

Referring to motion picture advertising for electric railways, Mr. Downey said that its value hinged upon the question of whether one should consider advertising in the nature of a food or a tonic. His thought was that as good as motion picture advertising is conceded to be (and it is the highest type of spectacular advertising), it is only tonic advertising. It can be used only at intervals. While a picture acts as a stimulant, every one knows a stimulant quickly wears off, and it is thus necessary to resort to more permanent advertising appeal. What is really most effective is a medium that will give the possibility of repetition, since selling depends upon the repeated telling of the advantages or value of what is to be sold.

Commenting on Mr. Grant's remarks that the most valuable medium of advertising is the satisfied customer, Mr. Downey said he agreed. But unassisted by advertising, a goodly measure of the value of the satisfied customer is lost because word-of-mouth advertising, while the best, is also the slowest. Therefore, in order to get the fullest measure of return from the satisfied customer, his good will should be capitalized in advertising.

The subject of electric railway franchises was then treated in a paper by Mr. Alschuler and discussed by D. E. Parsons, both paper and discussion appearing elsewhere.

"Traffic Relations between Steam and Electric Railways" was the subject of a paper presented by Richard Breckenridge, traffic manager Aurora, Elgin & Chicago Railroad, Chicago, Ill. In this paper Mr. Breckenridge reviewed the development of the electric railways, bringing out how their construction as competitors of existing steam lines was similar to the present paralleling of the electric lines by motor-bus lines, and how this development had led to an antagonistic feeling toward the electric railways which persisted to this day and prevented to a great extent full co-operation between steam and electric railway companies. He stated various other reasons why interchange arrangements between steam and electric lines have not progressed much and how the electric lines are discriminated against, some of the inconsistencies of the relations, etc. He said that the electric lines seem to have made greater effort to effect freight, rather than passenger arrangements with the steam lines, while it would appear that the reverse should apply because of the preponderance of the passenger business of electric lines. He carried the view that probably the most effective way of commanding the respect of the steam lines was to originate passenger or freight business which would be attractive to the steam line as a joint proposition. He had not yet given up hope that some day the Illinois electric railways will have cars that may be interchanged not only among themselves, but with the steam roads as well.

C. E. Thompson presented a very able written discussion of Mr. Breckenridge's paper. It appears elsewhere in this issue.

A paper on wood preservation presented by Mr. Waterman of the Burlington Railroad contained some very interesting data on the results obtained and it appears elsewhere. This paper was discussed by Walter Buehler, the Barrett Compay, New York. He said that some railway men were inclined to depreciate the value of data secured from test tracks. He thought such a test was good, except that the life shown in the test tracks may not hold exactly true as a basis of figuring over an entire system with the varying conditions that would then be involved. Commenting on Mr. Waterman's advocacy of treating of all bridge timbers, Mr. Buehler said that some claimed that this made the timber too inflammable, but that he had other equally good evidence that creosoted timber is less inflammable than untreated timber. One of the things to be considered is the design of bridges to make them less inflammable, such as by using ballasted track across the bridge, etc.

Discussion on One-Man Car Design

Following the paper by Mr. Adams on safety-car design and the prepared discussion by Henry Cordell, both of which appear elsewhere, the general discussion of the subject brought out some very interesting ideas. J. R. Blackhall, general manager of the Chicago & Joliet Electric Railway, told how his company is starting to convert its entire city and suburban equipment for one-man operation. He considers the double-truck car to be superior for

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one-man operation, for while admitting that there may be some current saving in using the single-truck car and certain other advantages, yet he felt that the advantages of the double-truck car more than outweigh these. In studying the platform equipment for one-man operation, Mr. Blackhall had been impressed with the unsightly appearance of the piping and devices and the inconvenience of its arrangement for the operator. In rebuilding the cars in Joliet, therefore, a special effort to avoid both of these points is being made. The controller is to be set in a hole in the platform so that it will be lowered 6 or 7 in., and a shelf put straight across the front of the car between corner posts and the controller and brake handle mounted on this. This gives the operator a chance to put his knees comfortably under the table with both operating levers at a convenient location and comfortable height. The controller handle is connected by chain and sprockets to the drum. All piping and conduit and other equipment is then concealed in a cabinet, with considerable improvement in the appearance. Mr. Blackhall expressed the thought that it may possibly develop that a remote-control will be more satisfactory than this drum control as it is to be arranged in these rebuilt cars, and the manufacturers are giving some consideration to the subject.

Effect of Local Conditions on Safety Car Design

M. B. Lambert, Westinghouse Electric & Manufacturing Company, in referring to the past experience of the operating men with light-weight equipment, said that the manufacturers had also had some excellent experience that would be very valuable in further development work. The argument of "local conditions" used by some electric railway men as the reason that they could not make use of the so-called standard safety car has been looked upon as inconsequential, but Mr. Lambert said we must now admit that there are local conditions that affect the trucks, the motors, the brakes, and everything about the car. The one-man car problem today is broadening as to whether 25 hp. or 35-hp. motors should be used, and whether two motors or four motors on double trucks. Where the use of the standard safety car has been greatly successful, this success has been one of merchandising rather than of operating economies, for there probably has been some high maintenance. It is possible, therefore, that a larger, four-motor, more substantially built one-man safety car will be better, for this will give better traction and better acceleration than can be had with a single truck and two motors. The car is primarily for the purpose of giving rapid service, and all features of the design should be directed toward that end.

Mr. Lambert then emphasized the great value of keeping performance records. He said that no other device known to the electrical art has undergone more rapid development than the street-car motor. This development is costly and the industry has had to pay the cost that has resulted from the necessity to do too much of this development work without good information on which to base the development.

Further Facts Regarding the Chicago Car

Mr. Adams then answered some of the points raised in the discussion. On the use of aluminum air piping, he said that this was being watched and studied very closely on the new Chicago Surface Lines car, and that he had serious question in his own mind whether it would be practicable. Step heights of the one-man cars are a very important item of the design, the steps on Chicago's newest car being 13 in., and 12 in. onto the platform and 6 in. onto the car floor. As to the use of a selective door control, making it possible to open either entrance or exit doors separately, or both doors simultaneously with the one brake valve handle, he said this would necessitate nine additional pipes on the platform. He had considered that this was a complication which was hardly warranted and had avoided it and at the same time obtained a partially selective control by the use of a separate handle just above the brake handle which makes it possible to open the exit door without regard to the position of the brake handle.

On this first double-truck one-man car four 25-hp. motors have been used, but there is likelihood that four 35-hp. motors or two 50-hp. motors on maximum traction trucks may be used on any future cars built. He said that the Chicago Surface Lines has 650 two-motor equipments in operation and that during the very severe winter of 1917-18 a large number of motors were lost. Many of the four-motor cars were running around during this period with only three motors in operation, and holding to schedules, but with the two-motor equipments, when one motor was down, the car had to be shopped. This was a very serious disadvantage for the two-motor equipment. The problem is one of cost, and if there is enough advantage in this respect in the two-motor equipment to offset this other disadvantage, they may be used on the safety cars in prospect.

Surface Lines' Car Design Indorsed

W. H. Sawyer, president East St. Louis & Suburban Railway, concluded the discussion on one-man cars by admonishing every railway man present not to leave the city until he had seen Mr. Adams' double-truck safety car with the separate entrance and exit and automatic doors at the exit. Mr. Sawyer has been one of the strong advocates of the standard car, and he said he had been out to see Mr. Adams' car and that nothing would have pleased him more than to have been able to find some flaw in this new design. But he had not been able to do it. The small single-door single-truck car is all right for the small city, he said, but Mr. Adams' car can and will be used in so many places where the standard car can never be applied that it opens up an altogether new idea of the field of the one-man car.

Bus Problem Briefly Discussed

In a general discussion of the use of motor buses, W. C. Sparks, Rockford & Interurban Railway, Rockford, Ill., told of the events leading up to the inauguration of bus service by his company. He said that when Camp Grant was closed the Fay Motor Bus Company had thirty to thirty-five buses on hand with no place to operate them, and finally succeeded in getting permission of the city to operate a competitive service with the street railway. The latter got an injunction immediately so that the bus operation never began, but in the final settlement of the matter with the city the traction company had to agree to buy some buses to serve certain territory not reached by the street railway—a newly-developed section of the city to which the street car lines had not been extended. Buses will be placed in operation within ten days to connect this district with the end of the car line, charging an 8-cent fare and issuing and receiving transfers between the bus and the cars. Mr. Sparks considered that these buses would not make any money, but if they kept competition out and broke even on expenses they would be well worth while. He also considered that it would be doubtful if this plan of operating the buses to connect with the end of the car line could be retained permanently, feeling that the buses would ultimately have to be operated all the way into the city, and that this would mean a duplication of service. For this special service, the trolley bus was not considered at all, because of the feeling that the proposition was likely to be temporary. The buses to be used are White chassis with body built by the Kuhlman Car Company and he said they were much finer than those used by the motor bus company.

J. C. Thirlwall, General Electric Company, contended that very few interurban bus companies are making any money. He said the only reason the buses in city service can show any profit is that they are not attempting to provide additional equipment to handle rush-hour service as the railways have to do. W. G. Brooks and M. B. Lambert, Westinghouse Electric & Manufacturing Company, expressed the general view that the main problem before electric railway men is to study the motor bus and determine where it can be used to advantage. The electric railway man is primarily a transportation man, and he should not shut his eyes to any new development that may fit in anywhere into his business of providing transportation. Mr. Lambert suggested that a committee be appointed to make a special study of the bus and report to the association.

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Advertising the Electric Railway's Service*

The Well-Edited House Organ, Proper Newspaper Contact and Well-Informed Employees Are the Means of Creating Favorable Public Sentiment— Moving Pictures in Which the Appeal Is Indirect Are Valuable in Soliciting Patronage

BY J. J. MORAN
Chicago, North Shore & Milwaukee Railroad, Chicago

IN CONSIDERING the question of advertising the electric railway industry, we might put the subject under two general headings, viz: publicity aimed at creating a friendly atmosphere and selling good will and advertising to induce travel and sell transportation service. The former is essential to all transportation lines, whether they serve a local community alone or whether they branch out into the interurban field, while the latter is more directly needed by the interurban lines. In discussing methods to be employed to obtain the object sought, we might, under our first heading, consider house organs, newspapers and employees.

The house organ, if properly edited, can tell the general problems of the property in a concrete way, which will be understood by the traveling public who are entirely unfamiliar with organization matters. Financial reports are usually puzzles to the uninitiated, and if they were brought down to a basis where the every-day individual could understand them, they could serve a very broad purpose. In addition to the financial condition of the property, the problems with which a company is confronted daily can be explained and the columns of the organ opened to patrons for suggestions or requests for information. Many people have ideas which they feel would help service but are reluctant to give them expression. Others are not so reluctant, and if the thoughts are passed on by those, others receive the benefit of the explanations given. Great care should be exercised to see that the information furnished is accurate and clear. If your readers come to a realization of the fact that the information received through this medium is dependable, it will go far toward creating confidence in the company as well as a spirit of good will toward it.

Our second subdivision is newspaper advertising. It is very essential that a representative of the property keep in constant touch with the newspaper office, especially in small cities, and that the editors of the paper are treated in such a way that they will know their suggestions and criticisms are properly received and acted upon. If this thought can be conveyed to the local press, any criticisms or suggestions in connection with service, which might be received by them, will be immediately taken up with the company representative and the subject discussed, so that the editor will be able, if necessary, to publish the company side of the controversy from the fact that he is in personal touch with the transportation official, and it will have a tendency to make him look at the company's problems with sympathetic understanding.

The third subdivision is the employee. The employee is one of the best assets that a property can have for creating public sentiment in favor of the company, if care is taken to see that he is properly informed on the company's problems. Much depends upon the supervisory force as to the success of this work. From time to time executives in all organizations discuss problems with their department heads, feeling that in these discussions they are doing all that is necessary; but they fail to see what view the next group of their employees may take on the same problems. It is just as necessary to have trainmasters, supervisors and clerks thoroughly educated on problems of the industry as it is for executives and officers themselves to be thus informed. These men in turn are in touch with the employees who come in direct contact with the public, and can disseminate this information to the ranks and in that way pass it on to the public. Therefore, instead of having one publicity man in the organization, you immediately increase that department so that every employee becomes a member thereof. The minute a trainman hears a discussion on an affair of the company, he will break in and give the persons present the benefit of his knowledge. The majority of residents in a community are not in possession of facts and figures, and the moment an employee undertakes to explain conditions to them, quoting facts, that minute the talk changes, for the reason that the individual making the criticism usually is at a serious disadvantage. These facts are brought into the homes by the employees and into various organizations to which they belong, with the result that the truth on the situation is finally carried in a forceful way to the attention of every resident in the community.

If this is successfully done, it will have a strong tendency to iron out many of the present-day troubles of transportation companies and ill-feeling on part of the public; and will force the issue out of the political field. The politician has been using the public service companies as a football for a great many years, but he will cease his attacks in this direction as soon as he finds that public sentiment is leaning the other way. The removal of this question from politics is one of the most needed things of the present day.

In connection with advertising for patronage, it is very questionable if much can be accomplished in that direction in the local transportation field. If a person has to go to a certain point in a city, he will take the public service line to reach that point, but if he has no occasion to go there it is very doubtful whether or not the best worded advertisement could induce him to go.

On interurban lines, however, advertising is very essential for the reason that there is usually competition and the property which shows the better degree of service at the greatest savings in both time and money naturally gets the business. For this purpose, billboard, car card and moving picture advertising can be used to good advantage. Three of the above methods have been tried out for years and have proved effective, so that it is hardly necessary to discuss them in detail, but the last named is not so well known.

In considering moving picture advertising, two things are essential: There should be a story which will interest the audience, and a proper method of distribution. In the early days of moving pictures, almost anything could be shown on the screen, but as the industry improved it became more and more difficult to secure space in the various theaters. At present it is almost impossible to secure the consent of a moving picture house to display any type of advertising. Where a patron pays his money to see a show, he naturally resents having his time taken up in reading advertisements. He can see these in the streets or in street cars without paying a premium; therefore indirect advertising must be used. The first step is to make a study of what your property has for sale; second, there must be an interesting scenario around which you can build up a story of your service, and one that will create the desire for travel without directly appealing to the audience; third, there should be a good camera man, and fourth, a reliable distributing agency to handle distribution of the picture.

This method of advertising was tried out on the North Shore Line two years ago and has proved very successful. The story starts in the early days of Chicago's history, showing Fort Dearborn, the old Kinzie House and the Indians in their native garb, traveling on the old Green Bay trail, running from Chicago along the lake shore and through north shore towns to Milwaukee and Green Bay. This old trail is paralleled by the North Shore Line. The picture then changes from the Indian scene to the present central district of Chicago, showing the present-day method of travel compared to the Indian in the former scene.

The picture simply shows a train pulling into the station at Adams Street and Wabash Avenue and passengers getting aboard. The name of the road is not brought out in any way to indicate advertising. The various steps of the Indians' journey are then taken up—each step contrasted with the present-day electric method of travel, and gradually a travelogue is served by the line. Finishing in Milwaukee, the picture shows the train pulling into the North Shore station. The name of

*Abstract of paper read at meeting of Illinois Electric Railways Association, Chicago, March 15-16, 1922.

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the road is strongly brought out on the side of each car as the train slowly passes the machine. The accommodations at Milwaukee terminal are then shown, followed by a travelogue of the city of Milwaukee. The most interesting feature in each community is emphasized in this picture, and only at rare intervals is the road itself shown; so that unless a person was thoroughly familiar with the district, the film could not be connected with this property until the final scene. By this time the thought of travel has been planted and the desired result obtained.

This reel was shown in more than 300 theaters in Chicago, in all of the motion picture houses in towns between Chicago and Milwaukee, in more than 100 theaters in Milwaukee, and in choice locations as far south as Gary, west to Aurora and Elgin, and north to Watertown, Sheboygan and Madison, Wis.

Before showings were made in the various towns served by the North Shore, notices were sent to the newspapers calling attention to the fact that the picture would be shown, with the result that residents in the vicinity of the theaters immediately made arrangements to see their own community in moving pictures. The story which I heard all along the line was that the majority of moving pictures in the present day show wonderful scenes in New York and San Francisco, but "we never have an opportunity of viewing our home towns."

In addition to theater display, the picture was shown at the Pageant of Progress in Chicago, at county fairs, expositions and to numerous commercial associations, church organizations and in private clubs. Even some of the schools solicited its use for educational purpose. Numerous incidents have proved that it actually procured business. At the Pageant of Progress Exposition, a tourist party stopped, saw the film and changed their plans and chartered a train for Milwaukee and return. At an exposition in Milwaukee a society had almost closed arrangements to travel to Chicago over another route when some of their members saw the film, communicated with the committee in charge of arrangements and prevailed upon them to change the plan. You can readily see that owing to the fact that pictures tell your story in a way which registers quickly and clearly, and tell about your service in a way that is not offensive, good results will follow.

"Give Service that Will Sell Itself"*

By Luke Grant
Manager Publicity Department, Chicago Elevated Railroads

IN DISCUSSING some of the methods of advertising the electric railway industry, Mr. Moran appears to have directed his comments more to publicity men than to executives. I shall direct my remarks to operating officials. I believe they, in large measure, are the men who are responsible for whatever success the publicity man attains.

While railway officials have come to recognize the public's interest in railway operation and are anxious to take the people into their confidence, the public is not yet fully "sold" on the proposition. The big problem, therefore, in advertising the electric railway industry is to convince the public that the railway executives have seen the light.

How can this best be done? Mr. Moran has pointed out a few of the methods to be employed, but the effectiveness of any of them depends upon one method, which I will give you in a sentence—*Give service that will sell itself.* Get the public talking about the *good* service, instead of the *poor* service, and the publicity man and the advertising man will have a smoother road to travel and their work will be more effective.

I realize that I have set the operating men a big task. Most of you no doubt will say that you are now giving excellent service, and, measured by past standards, that undoubtedly is true. But the public has set new standards, and there is always danger that the men who are actually operating railroads are too close to the job to get the right perspective. The man poring over schedules and car mileage in his office is apt to have a different view of the service from the man who hangs on a strap.

It is the business of the publicity man, as I understand it, to try to place himself in the position of the strap-hanger and from that position endeavor to gage public sentiment. That is why I am talking frankly to the operating men, because I am not quite sure that everything possible is being done to give the kind of service that the public demands, and I realize how futile publicity and advertising are when they are not backed up by good service.

The best kind of advertising that a company can get is to have its patrons talk of the good service. That can be done. It is being done to my positive knowledge. On one of the roads with which I am connected, it is the most valuable advertising that we get. A man who has taken a trip over the line tells an acquaintance of the good, convenient service. The acquaintance tries it on his next trip. He has already formed a favorable impression from what his friend said of the service. He finds it comes up to his anticipations and becomes a regular customer. I have received scores—yes hundreds—of letters from passengers who got acquainted with the service in just that way. The effect of such advertising is cumulative. Every customer becomes a salesman for the service and the company gets the most valuable kind of advertising without the expenditure of a dollar, except, of course, the cost of giving service that sells itself. The spoken word is always more effective than the written word.

I do not wish to create the impression that if good service is given, there is no need for the publicity man. Good service will make his work more effective, but there is a place for him in every organization. If you are giving good service, let the public know about it. Encourage customers to talk about it. The point I have endeavored to make is, that when the publicity man writes something about the good service a company is giving, the executives should see that the service really is good. That is the way to make advertising effective. The public will not be "sold" on untruthful advertising. It demands real service and will not accept word pictures as a substitute.

*Discussion of paper, "Advertising the Electric Railway's Service," presented before the Illinois Electric Railways Association, Chicago, March 15-16, 1922.

The Modern Electric Railway Franchise*

To Provide by Ordinance the Rate of Fare Is Injurious to the Public in the Last Analysis — Local Ordinances Should Include Provisions Peculiar to Each City, While Rates and Service Should Be Within the Commission's Power

By Benjamin P. Alschuler
Alschuler, Putnam & Flannigan, Attorneys at Law, Aurora, Ill.

APPROACHING this subject in line with the most progressive thought of the times, I might say that there is no such thing as a modern electric railway franchise granted by a municipality. This is particularly true in those states which have been most progressive with respect to the regulation of utility companies. In Wisconsin, for example, the right to use city streets is now granted by the state regulatory body under so-called indeterminate franchises. But unfortunately for the public and the street railways in Illinois, legislation has not advanced in our state as it has in some other states. We still have to deal with our local councils and boards of trustees when it comes to the granting and securing of rights to operate street and interurban railways in streets.

In former days when ordinances were passed, it was the custom to write into them all manner of provisions, having to do principally with the compensation to be paid for the use of streets, with the imposition of burdens for paying for pavements, sprinkling, cleaning streets, for making annual payments into the city treasury, etc., and what was then looked upon as one of the most important provisions was with relation to the rate of fare that might be charged. In that particular most street railway ordinances were uniform in that fares were fixed at 5 cents.

Street railway companies in Illinois

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have had to carry on litigation with municipalities to have 5-cent fare provisions set aside. True, the law is no different today than it was twenty years ago with respect to the effect of ordinance provisions fixing rates, but unfortunately a large proportion of human kind do not want to believe the truth if it does not agree with its ideas as to what the truth ought to be. As far back as 1899 an ordinance provision fixing a rate was held by the Supreme Court of Illinois not to bind subsequent City Councils; in other words, it was held that a Council had no power to make a contract fixing the price for all future time, and the Supreme Court then said:

What might be proper for a city this year might not be proper the next year. It is impossible to determine with absolute or even tolerable certainty what changes a few years might work in the character and reasonableness of rates. No contract is reasonable by which the governing authority abdicates any of its legislative powers and precludes itself from meeting in a proper way emergencies or occasions that may arise.

This statement affirmed by the United States Supreme Court in 1899, fifteen years before our pubic utilities law went into effect in this state, has not served to educate the public generally, nor has it served to prevent unreasonable and unwarranted litigation on the part of public officials, and even now, although the Supreme Court since the adoption of the utilities law, has reiterated the statement made back in 1899 by such language as was used in the Quincy case: "The municipal authorities of this state have never been clothed with power to fix by binding contract rates for any definite term of years." When it comes to making application for new ordinances in municipalities we are always met with the demands of city officials that we make provision relative to rates.

No fixed and invariable fare can be reasonable because conditions change. We know that a utility charged with a public duty is entitled to earn a fair rate of return upon property used and useful, devoted to the public use; and with varying conditions as to costs of operation and maintenance, the fare must vary to bring that rate of return to the company and so that the public may be served at a price that conforms to the variation in costs.

There is no question but that the public is primarily interested in service. True, a large proportion of the people do not know this. An extra penny is not of nearly as much importance to an individual as safety, cleanliness and adequacy of service. If it be properly brought home to the individual he will appreciate the truth of this statement, but when it comes to negotiating for ordinances the apparent paramount thought of the municipal official in far too many instances is the rate of fare, service being but a secondary consideration, if any consideration whatever be given to it.

But people are becoming educated to these things and it is only to be regretted that the campaign of education which our utility associations have been carrying on so well during the past three or four years was not begun twenty years ago.

Since Jan. 1, 1914, we have had in Illinois a regulatory law which by implication is written into every ordinance. It has superseded all the regulatory provisions of the existing ordinances. And any new ordinances that may be passed, if they contain any regulatory provisions as to such, must give way to the superior authority of the state as expressed in the Illinois utility law. In other words, to include in any ordinance today any provision, other than the statutory provisions, relative to what fares shall be, now or hereafter, is but a futile endeavor. We of course will meet with the political municipal official who seeks to curry favor with the public or to profit at public expense who will endeavor to include regulatory provisions in an ordinance and who must know, if he is properly advised, that any regulatory or police provision as expressed in an ordinance is contrary to our statutes.

It has been, as I might say, my misfortune to be placed in a position where I have had to negotiate street and interurban railway ordinances in the past few months. In this work I have been acting under the orders of United States Judge Evan A. Evans in a receivership proceeding. Following a suggestion made by the judge before an assemblage of leading and representative citizens of communities served by the particular company in his court room in Chicago a committee representing the different municipalities was appointed, and I have been negotiating with this committee ever since. The principal point at issue seems to be the inclusion of a fare provision in ordinances, to which of course I cannot agree because our law does not permit it, and were I to agree to it, it would be merely the procuring of ordinances under false pretenses.

People are learning more and more every day that the regulation of utilities, including the fixing of fares, is in the hands of the state; they are learning more and more every day of the problems of utilities and also that if they are to have service the utilities must be permitted to earn their way. Of course, in years gone by it was looked upon almost as rank heresy for utility companies to take the public into their confidence, but with practically no exception the utility operators have come to see the light and now appreciate the wisdom of publicity. This publicity will in time educate the public to a point where it will learn that the street railways and other utilities are but associations of people who have invested their money in a common enterprise for the purpose of serving the public and to earn a fair return upon the money which they have been willing to risk. If they are to render an efficient service they must be permitted to earn that fair return.

We have read considerable in the public print and in our railway journals of the Des Moines situation and of the Des Moines ordinance, which is somewhat different from the stereotyped service-at-cost franchise in that the valuation of the property for rate-making purposes is not mentioned. This ordinance appeals to me as one which, if it could be adopted in Illinois, would undermine opposition in that its fairness is so apparent upon its face; in other words, it states that certain returns should be permitted to be earned upon outstanding bonds and funded debt, the amount of which was agreed to. It has a sliding scale of rates and with the primary rate in effect the company is not permitted to earn any return on its common stock, but as rates are reduced earnings may be set aside on common stock, increasing as the rates drop. Such an ordinance is one that will appeal to the public, but in practical effect we have such an ordinance in every city in the State of Illinois today. True, our commission fixes rates upon valuation, but the value of the Des Moines property was considered when agreement was made as to the amount of funded debt upon which the company should be permitted to earn return.

The public today is better educated than it was in the past with respect to the fallacy of payments made by companies for pavement, for licenses, etc. It is becoming educated to the fact that such payments must in the last analysis be made by the car riders. It is beginning to realize that such expenditures in no way serve to improve service and are nothing more nor less than a dead weight which the company must carry and that with such expenditures eliminated from ordinance provisions a corresponding reduction will be reflected in the rate of fare. But I say the public is just beginning to realize. It must also be made to realize that, in the last analysis, expenses of companies in litigation with municipalities must be borne by the car riders.

It is a rather anomalous situation, however, for a city to have the right to state whether or not a company may operate on its streets and then have all manner of regulations left with a state regulatory body. The wisdom of statewide regulation has been demonstrated to the satisfaction of practically all students of the question. It is the theory of regulation that utility operation shall be a monopoly and that it is within the power of a commission to require satisfactory service at reasonable rates. Who the operator may be or who may compose the company is of small moment to the community served so long as adequate service is rendered at a reasonable rate.

The length of time for which a given company may serve a community is of no real concern either to the community or its government, except that they should be concerned to the extent that they shall be adequately served for all time, or at least until progress in

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the art may require different methods of operation. Such being the case, there is no good reason why a local council should prescribe who may or who may not operate a given utility, nor should it prescribe the length of time for which it may operate. A regulatory body with all the facilities at its command is in far better position to judge as to who should or should not serve the public. It can judge of the policies of the operators and of their financial ability to provide service. The indeterminate permit granted, as for example in Wisconsin, by a state body, would seem to be the answer and I look for the day not far distant when through the co-operation of our committee on public utility information, the people themselves will advocate and favor such system in Illinois.

SIMPLICITY SHOULD BE THE CHARACTERISTIC OF A FRANCHISE

The modern electric railway franchise, limited to conditions and laws as they today exist in Illinois, after all is but a short, concise and simple proposition. It should be nothing more nor less than a grant of authority by a municipal legislative body to a company to operate its railway. To charge for the use of the streets is but another way of increasing rates of fare to the car rider for the benefit of the taxpayer. To make a company pay for pavement which it does not use is but another way of reducing the cost of pavement to the property owner whose property is benefited because the railroad is located on his street. To require a company to pay for sprinkling and cleaning streets is but another tax upon the car rider for the benefit of the property owner. All these items, paid for by the car rider, simply serve to keep rates up; they contribute nothing to the successful rendition of service and they must be eliminated from franchises. To provide by ordinance for a rate of fare serves only to cause trouble and litigation. If such provision could be made effective it could but serve to injure the public in the last analysis, because if the rate agreed upon is too high the public would be paying too much for a ride, and if it is made too low, then service would of course be correspondingly curtailed.

With the inclusion of proper provisions for conditions peculiarly local, an ordinance which would be entirely free from political bunk and which would in fact be the only ordinance that would be in conformity with the law, could be written somewhat in this fashion:

"Right, permission and authority are given to ——— Company to lay down and maintain its railway tracks and to operate its cars thereon, together with the right to construct, maintain and operate its lines of poles and wires in connection therewith for the operation of a street railway system upon the following streets (naming them) in the City of ——— for the period of twenty years from and after the date of the passage of this ordinance."

Discussion on Franchise Paper

BY D. E. PARSONS
General Manager
East St. Louis & Suburban Railway

IN ILLINOIS electric railways are regulated as to service and fares charged for service. Conditions of the past few years in our industry have been such that it has given those who are interested in the street railway business considerable anxiety as to what the railways should have in reference to regulation, both city and state, in order to perform a service that will be satisfactory to the patrons of the utilities.

In his paper, Mr. Alschuler has mentioned a few types of franchises that are being tried, but the "indeterminate" franchise, most of us agree, is the most desirable for the proper rehabilitation of street railway financing. Such a permit, of course, should be exclusive, it should allow the fare to be flexible, it should insure against competition which parallels, it should permit not only ample regulation but regulation which will not confiscate, and regulation that is flexible enough to give a fair return on a fair value of the property at all times.

Most of the public utility operators find that the old franchises are as a rule worthless and destructive, consequently those financially interested and those in direct charge of operation have found it necessary and urgent that the railway companies immediately start an aggressive publicity campaign, with the object of presenting a correct and honest viewpoint to the minds of the public, the press, and the city and state officials.

History tells us that the American people are not unfair on any problem if they understand, and if they are not improperly influenced in the wrong direction.

I have recently read an editorial in the *Railway Age*, under the subject: "Why Not Sell Necessary Service at a Profit?" The editor makes the following assertion: "We have said that the public fixes the prices it will pay. Here is a fact of vital importance which is constantly overlooked by many managements. The railways, collectively and individually, are well organized and equipped to present their cases to lawmakers, commissions and courts. In other words, they are well organized and equipped to 'sell' the lawmakers, commissions and courts. It is a well-known fact, however, that over and over again they convince lawmakers, commissions and courts that certain policies should be adopted, and that in spite of this, directly contrary policies are adopted. Why? Because the lawmakers, commissions and courts have been 'sold' the policies in question, but the public has not been, and it is public sentiment that finally determines the policies actually adopted."

In conclusion, the instrument that controls the destiny of a public utility, whether municipal or state, must take into consideration that in the long run it is to the best interest of the public to have its utilities operating efficiently year by year with a fair return to the investor.

Traffic Relations Between Steam and Electric Lines Improve*

Ill Feeling of Past Is Disappearing with Desire of Both to Improve Service—Electric Lines Have Created New Traffic, Relieved Steam Lines of Short Haul Unprofitable to Them and Are Natural Feeders of the Trunk Lines

BY C. E. THOMPSON
Assistant to President Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

THE prejudice which has so long prevented traffic relations between electric and steam railroads is a matter which every electric railway man should now appreciate, as many of the conditions which bring about the ill feelings of the steam road men for the electric road are now experienced by the electric railway in the competition of the jitney, the motor bus and the motor truck.

Not all the blame should be laid at the doors of the electric railways either, for, had the steam roads recognized that electric railways were a natural development and taken steps to use them as feeders rather than as competitors, the situation would be very different today. The electric railways, and the steam roads, also, should recognize that the motor car and motor truck are natural developments; that they have a field of usefulness and should take steps promptly to use them as allies to gather traffic in out-of-the-way places and deliver it to the rail carriers.

I believe the ill feeling of the past is fast disappearing. Many of the large steam railway systems have electrified terminals in large cities, some have entire divisions operated by electric power and others are operating the electric railways in their territory as part of their system.

When the steam roads were loaded to the breaking point during the World War, the electric lines demonstrated their ability to handle large volumes of traffic and made a place for themselves as a part of the transportation system of this country. In the transportation act of 1920, Congress recognized the electric railways, and while they rightfully exempt them from many of the provisions of the act, the law provides

*Abstract of paper read at meeting of Illinois Electric Railways Association, Chicago, March 15-16, 1922.

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that through routes and through rates and divisions shall be established between all carriers subject to the transportation act and vests the Interstate Commerce Commission with the power to establish through routes and joint rates between carriers without regard for the kind of motive power used. In case the carriers cannot agree as to the division of joint rates, the commission has the power to fix the proportion that each company shall receive.

With the better understanding that now exists, the demonstrated ability of the electric roads to perform as efficiently as the steam roads, with the disposition to deal fairly and openly, with the regulatory agencies definitely instructed by law, and the desire on the part of both the steam and electric roads to give the best possible service to the public, there seems to be no serious obstacle in the way of establishing the same traffic relations between electric and steam roads as now exist among the steam roads.

If such relations are desirable I believe the American Electric Railway Association, the various state associations and the individual companies should make a united effort to bring about full recognition by the steam railways. When the facts are presented showing the enormous volume of business now handled by electric lines, what a factor they have been in the building up of communities, how they have created a riding habit among the people, how they have relieved the trunk lines of the unprofitable short-haul business, and have been and can more and more be used as the creators of traffic and the natural feeders of the steam roads, and how the best interests of the public can be secured by full traffic relations, the desired results will readily be obtained.

The big question, however, is to what extent are interchange arrangements desirable? Most electric railway traffic men think that if they could become parties to all the joint tariffs applying in their territory, their problems would be solved and that greatly increased traffic would move via their line.

In order to discuss this question intelligently, we must divide it into two natural divisions—passenger traffic and freight traffic.

Passenger Traffic

Passenger rates are based on the distance traveled, the same amount being charged for the last 5 miles as for the first 5 miles of a journey. Generally speaking, the rates are the same on all lines, both steam and electric, in a given territory. The only exceptions should be those necessary to establish the proper differentials to offset the difference in the character of the service rendered. The only benefit to the public through joint fares is that of service. Time and inconvenience are saved by purchasing a ticket and checking baggage to destination, and where through routing of cars or trains is arranged for, the elimination of the transfer adds to the comfort and pleasure of the passenger. Joint passenger and baggage rates with steam roads are desirable and should be readily obtained. Before an aggressive effort is made along this line, however, it would be well for the electric lines of this territory to get together and put into effect joint passenger and baggage rates among themselves.

Freight Traffic

Freight rates are computed on an entirely different basis from passenger rates. While the length of haul is one of the elements considered, the classification of the articles is the chief element and the rate becomes proportionately lower as the distance becomes greater. The consideration of freight traffic naturally suggests a division of the subject as between carload freight and less than carload freight or merchandise shipments.

Carload Freight. — Most of the electric roads have physical connections with steam roads and interchange business at these junction points. In the absence of through rates, the local rates of the connecting lines are combined. The sum of these local rates being more than the through rate, the industry located on the electric line is discriminated against or the tonnage diverted from the electric line. Through routes and joint rates will, without a doubt, add a substantial volume of traffic and be of great advantage to shippers on or near the electric lines, and through routes and joint rates can, as I have pointed out, be obtained. Whether or not interline shipments can be handled on a basis that the revenue will pay all the costs of the service, including a fair return on the necessary investment, depends largely on the division of the through rates. The division allowed the so-called short-line railroads is such that most of them are in very bad financial condition. I know of no electric road having joint rates which keeps the cost of its freight service on a basis that it can tell whether the handling of through carload shipments is at a profit or at a loss. It is my opinion that most of this interline business is handled at a loss by the electric lines as well as by the short-line railroads. These are times when each department of a business should be self-supporting. A very exhaustive study should be made as to the probable financial results before arrangements are made for participation in all the tariffs published for the carriers.

Merchandise Freight. — Contrary to the general opinion, I think the l.c.l. or merchandise freight offers the greatest oportunity for the electric lines. Many lines are now engaged in this branch of the business with considerable success. Through rates between electric lines, and between electric lines and the steam roads, will do much to increase the popularity of this business. The principal difficulties are the lack of proper terminals in the larger cities and the cost of handling at stations. Both problems can be solved by co-operation between the carriers. Joint use of terminals will aid greatly. The use of containers will, I believe, solve the excessive cost of handling at stations and the transfer between terminals.

There have been a number of successful experiments in the use of various forms of container. A container will be designed that can be handled on motor trucks, on electric railway cars in city streets, on standard steam-road flat cars, on river barges or on ocean-going vessels, which can be filled at the factory door, handled by motor truck to the nearest station, transferred, if need be, from one terminal station to another by truck and finally delivered at destination with the least possible cost of handling. Here again the electric lines should work out interchange arrangements, first among themselves and then through concerted action with connecting steam lines.

Recent Developments in Car Design*

Premature Standards Which Will Hinder Progress Must Be Avoided, but Certain Group Dimensions Should Be Established—The Automatic Treadle-Operated Exit Door of New Double-Door Chicago Safety Car Is Described

By H. H. Adams
Superintendent of Shops and Equipment,
Chicago Surface Lines

THE development of the safety car has resulted in the rapid introduction of these single-truck units on a large number of properties. This widespread use of the car has been due primarily to the fact that their use makes possible a very substantial reduction in operating expenses and at the same time enables a more frequent service to be offered to the public.

The success of the car in meeting these requirements, and its consequent rapid introduction, has led some manufacturers and railway men to consider the construction as a final development, and it has been widely referred to as a "standard" car. Although operating experience in a number of places has suggested some very desirable improvements, a considerable sentiment has existed against making any changes from the original design.

None of us will question the desirability of working toward standards in car construction as rapidly as the development of the industry and conditions permit. Care must be taken, however, to avoid the establishment of premature standards which will interfere with progress. Before a body construction can be considered as a standard for a particular type of service, it must represent, in the opinion of the

*Abstract of paper read at meeting of Illinois Electric Railways Association, Chicago, March 15-16, 1922.

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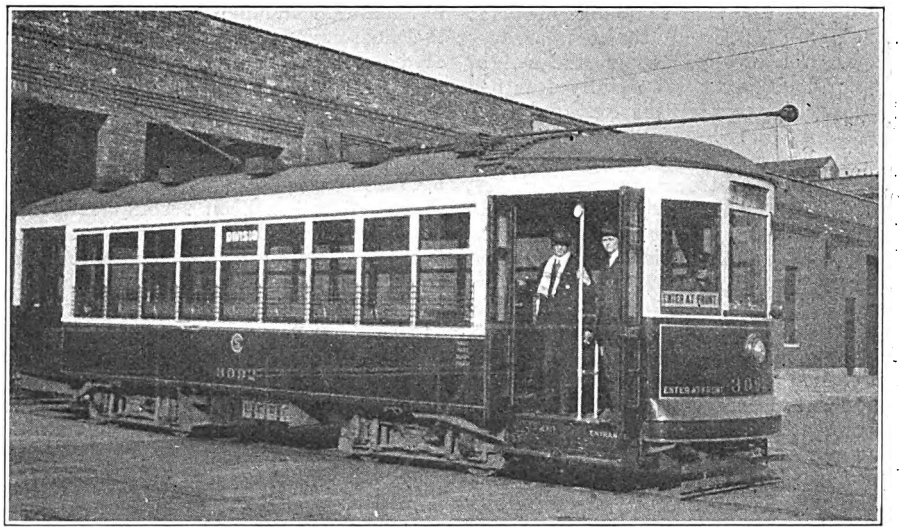
ndustry, the highest development, combining the factors of strength, weight, cost of construction and appearance. It must also represent the most effective and efficient arrangement for the safe, comfortable and rapid transportation of passengers. It is, in the writer's opinion, impossible to obtain in any single design of car, for service under all operating conditions on various properties in different parts of the country, the best combination of the above requirements. This problem may be met in the future by several types of cars, each designed for certain classes of service.

Considering the subject on the basis just outlined, I feel sure that there are very few of us who believe that we have reached a stage in any particular type of car now in operation where we are satisfied to stop and establish a standard. Every season shows long steps forward in the construction of lightweight cars. We are just beginning to see the possibilities of the future. The electric companies and the truck manufacturers are also apparently alive to the needs of the day. In car building, the use of higher grade, lighter-weight materials is just commencing. Development of non-corrosive steel has recently made some long strides. This in itself opens up to car designers undreamed of possibilities in reduction of weight and cost of construction. The application of lighter and better materials will and must affect the design of car bodies. Methods of handling heavy passenger traffic in more and more efficient ways are constantly being developed.

This does not mean that progress cannot be made toward standardization. Immediate progress of this nature can be made along the lines of certain group dimensions, fixing post centers, car widths, roof types, etc., into certain groups to be applied to meet the varying conditions on different properties.

Returning to the question of the one-man safety car, we in Chicago, although recognizing the great service which this car has rendered the electric railway industry by the successful establishment of certain principles of operation, have found after a period of experience under actual operating conditions on certain of our lines that this unit has certain inherent limitations. The most important of these limitations are: (1) Excessive time for passenger interchange, due to single doorway, permitting only one stream of passengers to alight from or board the car; (2) congestion within the body, due to narrow aisle and restricted space for movement of passengers at the front end; and (3) excessive damage resulting from comparatively light collisions.



THE 37-FT., 45-PASSENGER DOUBLE-TRUCK ONE-MAN CAR NOW BEING TESTED BY THE CHICAGO SURFACE LINES

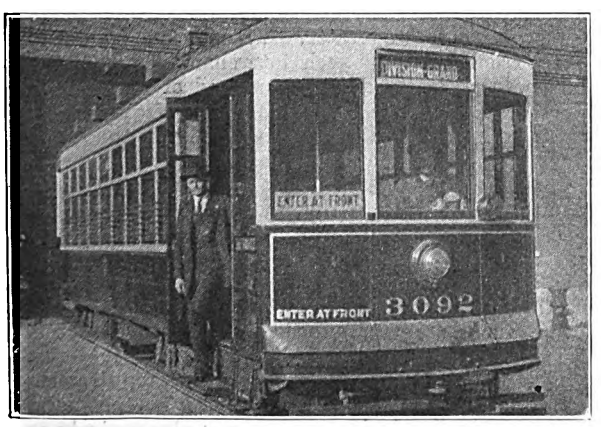
With these factors in mind we prepared a design which would more nearly meet our requirements, and our first efforts were along the lines of a single-truck unit. This car was made 8 ft. wide, 29 ft. 4½ in. in length over bumpers, and weighed, completely equipped, 16,375 lb. It is illustrated and described in the ELECTRIC RAILWAY JOURNAL of Jan. 14, 1922.

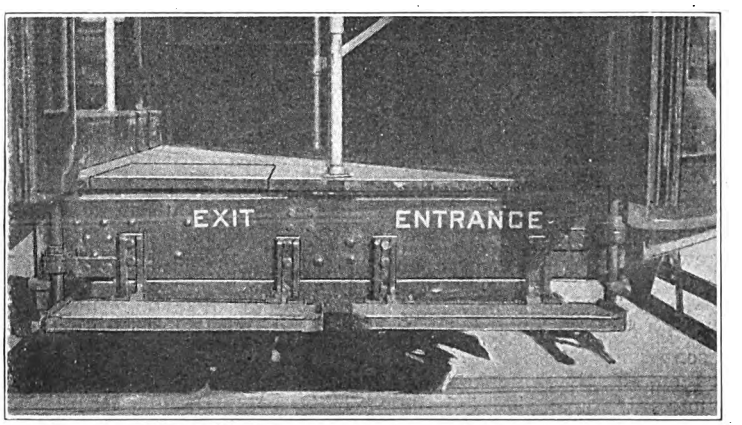
In the design of a car for city service, provision should be made for the efficient loading and unloading of passengers during maximum load conditions. Where schedule speed is of any importance, loading and unloading of passengers should be accomplished in the minimum time possible. The use of a single entrance for the interchange of boarding and alighting passengers is not in accordance with this principle of good railroading.

Our sample single-truck car was therefore provided with a double passageway at each end. The exit passageway is protected by means of a barrier, which is latched in a closed position. This barrier is released by a passenger stepping on a treadle in the exit passageway on the platform, thus permitting the gate to be pushed outward. After the passenger has alighted, the gate returns automatically to the latched position. This barrier was installed with an idea of educating the public to enter via the entrance passage and leave through the exit.

This car was completed and placed in service the early part of September, 1921, and has been in successful operation on outlying lines since that time. From observations of its operation, we decided that a double-truck car would give a more flexible unit and would more satisfactorily meet the service requirements on similar lines in Chicago. We attempted to work out a combination which would have the advantages of small, light-weight units, with which a frequent economical service could be rendered during periods of light travel, and which at the same time would take care of the heavier requirements of rush-period conditions.

The double-truck car, which is also illustrated and described in the Jan. 14 ELECTRIC RAILWAY JOURNAL, was made 8 ft. 6 in. in width, 37 ft. 2 in. in length over bumpers, and was provided with a double passageway at each end,





AT LEFT—IN COLD WEATHER PASSENGERS CAN LEAVE CAR WHERE THERE IS NO ONE TO GET ON WITHOUT HAVING BOTH DOORS THROWN OPEN. AT RIGHT—A CLOSE-UP OF THE PLATFORM SHOWING THE TREADLE CONSTRUCTION

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having the exit barrier as described for the single-truck car, in the exit passageways. Four 25-hp. motors, and a light pair of double trucks, specially designed to carry the center plate loads, were used. A line breaker was installed under the car floor to eliminate the objectionable platform circuit breakers, and a pneumatic tripping mechanism operated during an emergency application of the safety devices was installed directly in the line switch box. This car weighs 28,050 lb. completely equipped, and has a seating capacity of forty-five passengers. The aisle width between the end plates of the cross seats is 28⅞ in., which permits a free movement of passengers toward the rear end after the seating capacity has been exceeded.

The details of the design involve a number of interesting construction features, in all of which consideration has been given to the question of weight. In no instance has proper strength been sacrificed, and the structure is such as to give a very rigid construction with ample provision against excessive damage from minor collisions.

The car was completed and placed in service about the middle of December, 1921, and has since been in successful operation, handling passengers in a very much more satisfactory manner than the smaller car.

Considered from the standpoint of speed in handling passengers, it has been found that double passageways are a decided improvement and very much more satisfactory than the single passageways. Preliminary observations on our single-truck car, having double passageways, in comparison with cars having single passageways, have up to the present time shown a reduction of 31 per cent in time of passenger interchange, at stops where similar conditions prevailed.

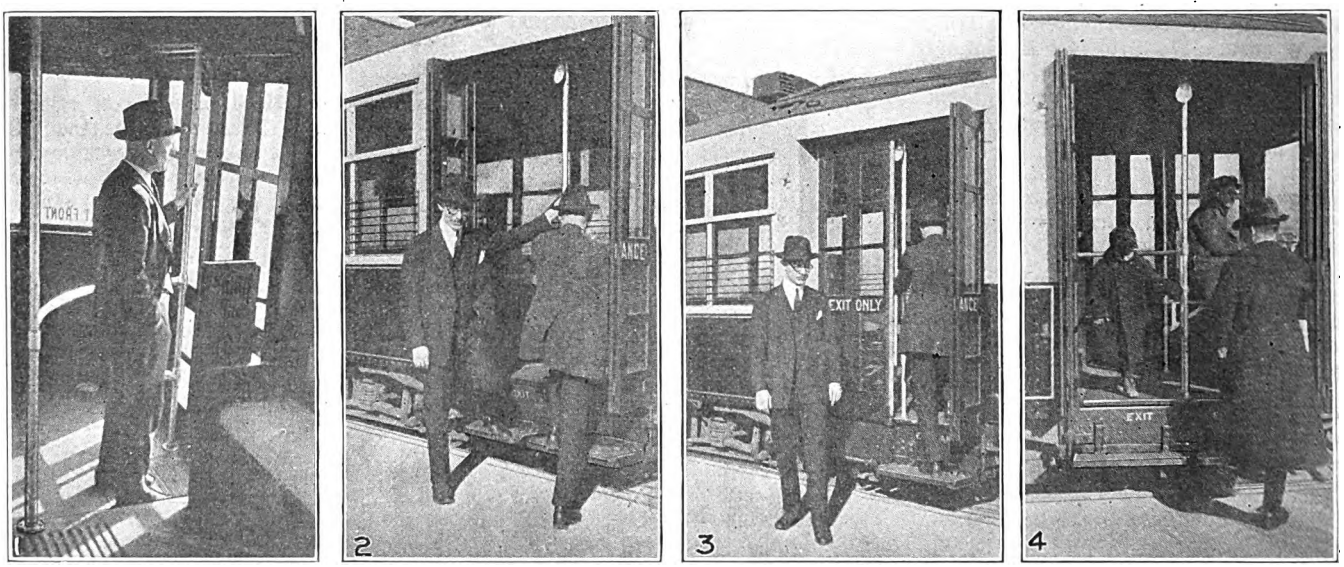
Our study of the problem of handling a maximum number of passengers in the most efficient manner on a car operated by one man, and at the same time to avoid distracting the operator's attention when he is collecting fares, has led to a further development for the protection of the exit passageway against passengers boarding the car there. This has been accomplished by making the exit doors automatic in their operation, through the medium of a treadle similar to that used with the exit barrier operation previously described. In this arrangement the entrance doors are connected with the safety control equipment and operate without any changes through the brake valve furnished with that equipment. The exit doors are opened by a passenger stepping on the treadle, which is made large enough so as almost completely to fill the exit passage, and makes it practically impossible for the passenger to stand in front of the exit door, without standing on the treadle. The exit doors cannot be opened by the passenger until a full brake application has been made, and brake valve handle moved to "door opening" position.

The door closes automatically and quickly with no supervision from the operator when the passenger has cleared the exit step. This is for the purpose of preventing boarding passengers from entering via the exit door. The door does not begin to close, however, until the alighting passenger has entirely cleared the step. When several passengers are leaving the car in succession, the door remains open until the last passenger has cleared the step. Provision is made to prevent jamming any one who might be caught in the door by attempting to enter through the exit side. When both the entrance and exit doors are open, they may be closed, even though a passenger remains standing on the treadle, by moving the brake-valve handle to the "door closing" position.

We believe that this automatic exit door simplifies the problem of rapid loading and unloading of passengers on cars operated by one man, and eliminates all objections that have been raised to the use of double passageways on a car of this type. The operator of the car is relieved of the necessity of giving any attention to alighting passengers when he is busy collecting fares. In cold weather passengers may be allowed to leave the car when there are none to board same without throwing open both doors.

The double-truck car has been equipped with two of these automatic exit doors, and is now in operation. We are making observations at the present time and are following the operation very closely. The door is interlocked in such a manner as to safeguard against accidents due to the carelessness of the passenger or the operator of the car.

In considering the general problem of handling passengers under the control of one operator, we believe that any arrangement for cutting down the time of interchange should from the standpoint of safety provide for all movement or interchange of passengers to be directly under the observation of the operator. This means primarily that all such interchange must be effected at the front end of the car, and it is therefore particularly desirable to so design this type of car that there will be ample aisle width and space within the body at the front end to facilitate the ready movement of passengers. For city service, where short periods of comparatively heavy congestion occur, a double-truck car properly designed offers a more flexible unit and affords a more attractive service to the public than the single-truck car. For the operating requirements on a great many interurban properties the double-truck car is also entirely applicable.



AUTOMATIC EXIT DOORS ON CHICAGO SURFACE LINES' DOUBLE-TRUCK ONE-MAN CAR

Number One. A passenger standing on the treadle cannot open the exit door until the brake handle has been moved to the door-opening position.

Number Two. The exit door does not close until the passenger has entirely cleared the step.

Number Three. After the passenger takes his foot from the step, the exit door automatically closes almost instantaneously.

Number Four. A "feather weight" passenger on the treadle will operate the door.

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How Electric Railways Are Being Advertised*

A Birdseye View of the Work Being Done to Improve Public Relations by Typical Properties Scattered from Coast to Coast—The Essentials of Good Work Are Stated to Be Frankness, Brevity and Clarity

BY LABERT ST. CLAIR
Director of Advertising Section
American Electric Railway Association

IT SEEMS to me to be worth while no longer to tell electric railway men about the value of good public relations. This has been shown by the results that have accrued to the companies that have tried to improve them.

Electric railway men are tired of having forefingers wagged in their faces, along with the declaration that "the goblins will get you if you don't watch out." It is time to declare a holiday on the wagging forefinger and substitute some plain talk on how companies that are doing constructive public relations work are achieving success.

Advertising, publicity and public-relations work generally have developed rapidly throughout the electric railway field in the last three years. Today approximately fifty per cent of the companies in the country, including virtually every large company, are engaged in this work in some form. The work of getting the electric railway story to the public finally is being divided along constructive lines. A smooth working plan of co-operation between local companies, state committees and our national association has been worked out. The Illinois committee has done splendid work, not only within its own State but also in blazing the trail for other state committees.

Taking the Illinois plan as a model, more than twenty-five states now have organized state committees and more are being organized right along.

There is scarcely a state in the Union which today does not have several electric railway companies that are doing big outstanding advertising and public relations work. For example, starting with Massachusetts we find the Eastern Massachusetts Street Railway operating a plan of community committees successfully. This company co-operates with the car riders in each community in forming a community committee to consider all questions as to service.

In Providence, R. I., the United Electric Railways is just beginning an advertising campaign. And coming down to Connecticut, we find the Connecticut Company engaged in intensive progressive public relations work. President Lucius S. Storrs, of this company, carries the electric railway story directly to the car rider in many different ways. One of the most successful things that he did was to wage a fight in the Legislature against unregulated jitney competition through the medium of a leaflet. With this single advertising medium and personal work in a few months he got the required legislation. He also has a policy of frankness with the newspapers which works.

In New York City the car card as used in the subways is well known, and in Brooklyn we find C. E. Morgan, the general manager of the Brooklyn City Railroad, addressing groups of employees daily in an effort to humanize his company. He also uses company publications, car cards and other advertising material to good effect.

In Philadelphia, the P. R. T. long since learned the efficacy of the car card and is making broad use of it and other advertising literature. Using the car card and leaflets as its advertising medium, this company once saved the skip-stop for its service which meant a million dollars a year.

Nowhere in the United States is found a smoother working public relations machine than that which has been set up by C. D. Emmons, president of the United Railways & Electric Company of Baltimore, Md. Here, every executive who comes in contact with the public is definitely assigned to a task. One man's activities center around local clubs; another is assigned to charities and other civic activities; a third deals with the politicians and public meetings, and a fourth is active in the Advertising Club and in newspaper circles.

Down in Richmond we find the Virginia Railway & Power Company using car cards and leaflets with highly successful results. This company recently passed through a bitter strike. By using the mediums mentioned as well as newspaper space, the company won a victory. In Charleston the street railway is headed by P. H. Gadsden, who proves his belief in advertising and public relations work by using newspaper space liberally to advertise his service.

Skipping along to Atlanta, Ga., we find P. S. Arkwright, president of the Georgia Railway & Power Company, pursuing a policy of frankness in dealing with his public and his men. He has the happy faculty of talking from the angle that is most interesting to the audience he addresses. For example, he talks electric railway service to merchants in terms of shoes, overalls, lollypops, etc. T. L. Small, in Baton Rouge, is effectively telling his story in 1-in. newspaper "readers." In New Orleans, the railway company has set a pace with car cards that is approached by few. In fact, the South is full of managements that are up on their toes courting the public.

In the North Central States some of the best work in the country is being done. Youngstown told its story effectively on the introduction of the monthly pass. The Northern Ohio Light & Traction Company has created a better public feeling through boosting community spirit. Toledo sold its service-at-cost plan to the people through publicity. One company in this territory now is making a personal canvass of every citizen to determine what it can do, if anything, to please its riders better. The Union Traction Company of Indiana, under the direction of Arthur W. Brady, is doing safety work that might well be copied by any company. E. M. Walker of Terre Haute has sold the safety-car idea to his riders in a manner which has excited favorable comment.

In Illinois W. H. Sawyer of East St. Louis is doing effective safety work and the Illinois Traction System excellent general publicity work. All roads might profit by studying the merchandising-of-transportation plans and safety work put into effect by Britton I. Budd on the Chicago Elevated Railroads. Likewise, it is a pleasure to see the Chicago Surface Lines telling its story through car cards and otherwise taking the public into its confidence.

Going west from Chicago we find the Twin Cities getting the frank story of their electric railway problems from Horace Lowry. In Duluth, R. B. Thompson is carrying on a continuous newspaper advertising campaign. Kansas City is learning its local railway story through frank, open discussion by the company. Lincoln, Neb., has just started issuing a company leaflet that is vigorous in style and well printed.

Farther west is the Portland Railway, Light & Power Company, of which W. P. Strandborg is publicity manager. Recently he not only has cultivated the most friendly relations with his public and the newspapers but has successfully floated two large security issues.

California is a territory that has been beset by bus competition of vigorous character. Paul Shoup and others in charge of the electric railway properties are continuing to "carry on." Through newspaper advertising, booklets, car cards and speakers, electric railway problems are being made clearer to Californians every day.

In conclusion, I repeat that *the electric railways are on their toes.* They are getting results, and those that are getting the best results are the ones that are following this brief rule in advertising and in public relations: Be frank. Be brief. Be clear.

*Abstract of paper presented before the Illinois Electric Railways Association, Chicago, Ill., March 15-16, 1922.

Safety Convention in Toronto

A JOINT safety convention under the auspices of a number of Canadian industrial and other organizations will be held at the King Edward Hotel, Toronto, on April 4 and 5. The convention is one primarily for employers, and the chief aim is to secure reduced compensation and eliminate unnecessary waste by extending the benefits of accident prevention in large and small industries. The chairman of the first session will be Sir John M. Gibson, K.C.M.G., president of the Ontario Safety League.

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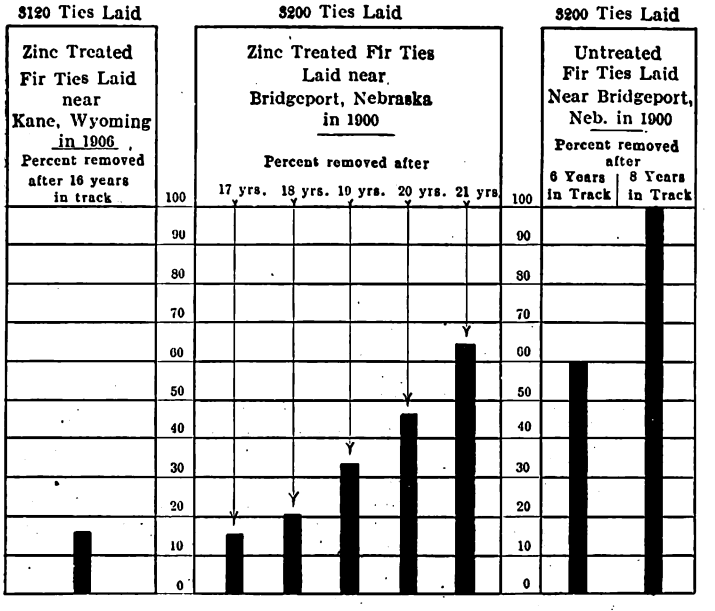
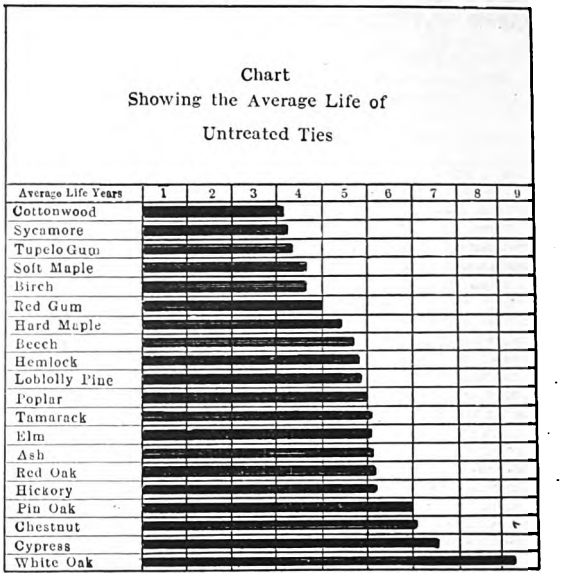


COMPARATIVE LIFE OF TREATED AND UNTREATED FIR TIES



AVERAGE LIFE OF UNTREATED TIES OF VARIOUS WOODS

Tie and Timber Preservation*

Numerous Experiments with Various Methods of Treatment and Varieties of Wood Have Been Conducted by the Burlington Railroad During the Past Twelve Years

BY J. H. WATERMAN
Chicago, Burlington & Quincy Railroad, Galesburg, Ill.

WHEN we began treating ties in 1898 we used a white oak untreated tie as a unit of measurement, the life of which was estimated at that time at eighteen years. It was thought then that if inferior wood like pine and red oak would last eight years when treated, the maximum life had been obtained. Exhaustive tests that we have conducted over a period of twelve years have proved to us that treated soft-wood ties have an average life nearly 100 per cent more than was expected.

The accompanying charts and tables show the results of our various tests. It is especially interesting to note in the summary of the total ties placed in the experimental tracks during 1909 and 1910 that practically all of the untreated ones have been taken out. This summary includes the test results of ties of various kinds, each kind having been treated with the various processes.

We have in our test tracks ties treated with the straight creosote, the Card, and the Burnettizing (zinc chloride) processes. A summary of the comparative life of ties treated with the two last processes in wet and dry climates shows how much longer life in the wet climate ties treated with the Card process give than to those treated with the Burnettizing process. The determination of proper treatment is largely a matter of experience. This is illustrated by the experience of one railroad which reduced the amount of zinc used from ½ lb. per cubic foot to ¼ lb. Although theoretically the lesser amount was sufficient, several

TABLE I—SUMMARY OF TEST RESULTS ON TIES OF VARIOUS KINDS TREATED WITH VARIOUS PROCESSES, AND PLACED IN EXPERIMENTAL TRACKS OF THE C., B. & Q. RAILROAD DURING 1909 AND 1910

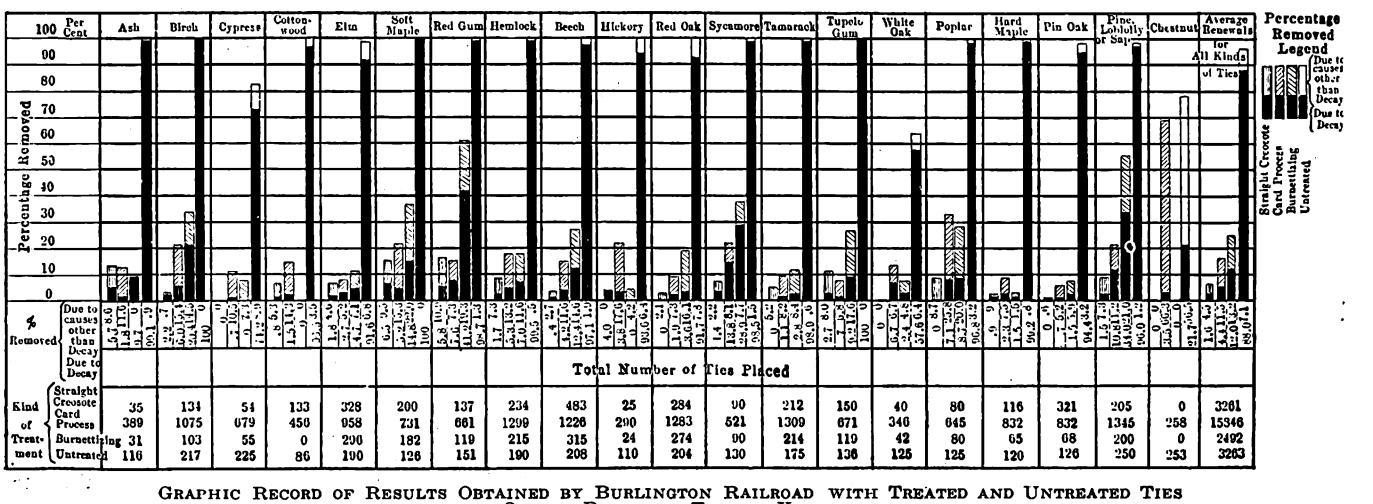
Process	Total Placed	Total Removed to Date	Percentage Removed Because of Decay	Percentage Removed for Other Causes
Straight creosote..	3,261	198	1.6	4.5
Card process.....	15,846	2,518	4.4	11.5
Burnettizing.....	2,492	629	12.0	13.2
Untreated.....	3,263	3,106	88.0	7.1

Note: Included in these percentages only are the ties placed in thousand lots on various divisions.

*Abstract of paper presented before the Illinois Electric Railways Association, Chicago, Ill., March 15-16, 1922.

TABLE II—COMPARATIVE LIFE OF TIES TREATED WITH THE CARD PROCESS AND THE BURNETTIZING PROCESS IN THE WET AND DRY REGIONS

Process	Region	Number Placed	Number Removed	Per Cent Removed Because of Decay	Per Cent Removed for Other Causes
Burnettizing	Dry..	773	156	3.9	16.3
	Wet..	1,719	473	15.7	11.9
Card process	Dry..	4,270	543	2.5	10.2
	Wet..	11,576	1,975	4.9	12.2



GRAPHIC RECORD OF RESULTS OBTAINED BY BURLINGTON RAILROAD WITH TREATED AND UNTREATED TIES OVER A PERIOD OF TWELVE YEARS

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years trial showed that those treated with a half-pound of zinc per cubic foot gave at least double the life of the others.

Bridge Lumber and Piling

Everyone, I believe, will agree that bridge lumber and piling ought to be treated. We have many bridges where the piling is apparently just as sound as when driven. In this case the treatment was with straight creosote by the full cell process.

In regard to seasoning ties and lumber before treatment, my observation has been that piling placed in the storage yard in the fall can be carried through until the second winter before it begins to deteriorate. In our location red oak piling ought to be seasoned from fourteen to sixteen months to gain the maximum benefit from treatment with preservatives.

In the past few years, during which I have watched closely ties under rail joints, I have found that they wear out much faster than those in the same tracks which are between the joints. Loose bolts have been found to be the cause of this severe mechanical wear.

It is hardly necessary for me to say that good ballast lengthens materially the life of a tie. A sufficient amount under the track helps to keep the ties dry by furnishing better drainage. Longer life of the ties may also be expected because of the more firm bed provided.

What the American Electric Railway Association Does and Stands For*

A Summary of the Facilities Which the Parent Association and Its Affiliated Organizations Have Placed at the Disposal of the Members, and a Statement of What the Association Is Doing for the Public

By Robert I. Todd
President American Electric Railway Association
and President Indianapolis Street Railway

THE spirit of the American Electric Railway Association is one of progress. Its purpose is to help the railways to serve the public adequately. The aim of its members is to make transportation safe and reliable; to give rides at the lowest possible cost; to furnish steady employment at fair wages to our employees, and to earn a fair return on invested capital.

As mutually helpful understanding is growing today between the public and the utilities, the impression that one is necessarily the enemy of the other is fast disappearing. Utilities, perhaps more than ever before, are placing their problems squarely before the public, and the public is studying and appreciating these problems more than ever.

The outstanding efforts of the association are first to show its members how to improve their service and next to help them sell the service to the people. The association is a clearing house for facts of vital interest to the industry. Through committees and a trained staff at headquarters it strives to supply to the railways the best information as to the conduct of properties and to the public the facts about our work which are of vital interest to the public welfare.

The climax of the association's activities is reached twice a year, at the midwinter meeting and the annual convention. All of the committees function under a regular schedule, the executive committee meeting monthly.

One of the outstanding activities of the association is the conducting of a Bureau of Information and Service, which supplies information relating to wages, working conditions, fares, buses, one-man cars, and many engineering, traffic and operating problems. Information for this bureau is obtained through clippings covering the principal trade and technical publications, public service and court decisions and questionnaires and other communications addressed to members.

As exhibits in court cases or hearings before public service commissions, as evidence in arbitration proceedings or for the purpose of merely fore-arming a member company when entering a wage negotiation, the reports and compilations prepared by this bureau have proved of inestimable value. More than 10,000 inquiries were answered last year by this bureau.

One of the newer activities of the association is the Advertising Section, financed by the Committee of One Hundred and designed to give service to all companies. The formation of this section was the outgrowth of the industry's first organized attempt to tell the story of its problems to the public at the time of the formation of the Federal Electric Railways Commission.

This section operates under the direct supervision of the committee on publicity. It has an experienced advertising man in charge. It constantly strives to induce companies to increase their advertising.

The Advertising Section prepares and releases news and advertising material for use through various publicity channels. It co-operates closely with the state committees on public utility information and other publicity divisions of national public utility organizations. It also renders a personal service to companies that desire it. Any manager may write to the section and secure, without charge, advice as to his particular problems. When a local problem assumes national interest a special investigation is made and a report is issued for release as a news story, leaflet or display advertisement by local companies. The section also co-operates with the committees on merchandising of transportation and safety, and assists other committees in the preparation of advertising material.

The association also, through its various committees, constantly watches the trend of national affairs with a view to promoting co-operation between the industry and the public as represented by governmental bodies. For example, its Washington office and its committee on national relations look after the interests of companies affected by the jurisdictions of the Interstate Commerce Commission, the United States Railroad and Labor Boards and the public service commissions of several states. At the present time the committee on national relations is co-operating with the other utility associations through a national joint committee in the study of such questions as the exemption from taxation of state and municipal securities.

The effort of the association is always to co-operate with government officials and as a result its relations with them are cordial. One of the most recent activities was in connection with a request from the Joint Committee on Agricultural Inquiry of Congress. In this case information was furnished covering the connection of electric railways with the transportation of agricultural products. As originally planned the scope of this inquiry was far more extensive than necessary and would have involved obtaining much material that would have been of no use to the commission. The collection of this material would have cost probably $200,000. The chairman of our committee on national relations and the executive secretary conferred with representatives of the commission and supplied all of the needed information immediately and at no cost.

Manufacturers and operators work together splendidly in this association. An instance of this is found in the recent formation of a manufacturers' special committee to spread the facts about our industry through manufacturing channels.

The association distributes monthly more than 6,000 copies of its magazine, *Aera*, devoted to educational articles largely by executives and heads of departments. It maintains close co-operation with the United States Chamber of Commerce, the National Industrial Conference Board, the American Engineering Standards Committee, the National Safety Council and other national organizations. Through its affiliated associations, the American Association keeps abreast of all that is newest and best in these different lines of activity.

Finally, the association's published proceedings form a valuable reference library of the progress and development of the electric railway industry. The reports of the standing committees represent the work of the best brains in the industry, and their recommendations and conclusions are available in these published reports.

*Abstract of address delivered before the Illinois Electric Railways Association in Chicago, Ill., March 15-16, 1922.

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A. R. E. A. Convenes in Chicago

Vast Amount of Information Covering the Usual Wide Range of Topics Brought in by Committees of Railroad Engineers at Their Twenty-third Annual Convention—Material Pertinent to Electric Railways Is Presented

THIS year at the twenty-third annual convention of the American Railway Engineering Association, held in Chicago, March 14 to 16, the twenty-three standing committees added a wealth of information to that already accumulated. An attendance of 2,000 members broke all records of participation in the Engineering Association proceedings. Differing from the work of the committees presented at last year's meeting, the preponderance of research done during the past twelve months was along the line of way matters. Although there is an increasing possibility of, and tendency toward, trunk-line electrification, but little investigation was made in this direction.

As with the electric railways, the steam railroads have found that the necessity for effecting the greatest economies possible has been more pressing than ever before. Their foremost problem, the labor question, was the subject of detailed investigation. For the purpose of studying some phases of this question, the association has actively at work two committees, one on the economics of railway labor and another on the economics of railway operation. Another committee whose work is tending to produce economy of operation is that on standardization. This work is designed to reduce the multiplicity of specifications for the various materials required in daily use on the railroad and to permit of the production of so-called standard materials at a smaller cost than is possible under present practices.

President Downs in his address at the opening session of the association dwelt on the failure of the steam railroads to attract technically trained men. Out of twelve replies to questionnaires from various universities came the information that during the past ten years there were 3,003 graduates in civil engineering, and surprising as it may seem, only 272, or 9 per cent, are working for the railroads. Though not finding out how many of the men of the engineering department of the railroads were graduates of engineering schools, Mr. Downs found from a count made on two railroads that employed about 350 engineers that only about 50 per cent were graduates of technical schools. Some immediate effort must be exerted, he urged, to bring technical men into railroad work. A canvass made by him discloses the fact that the average monthly salary paid to the young engineering graduate entering railroad work is $118.

Speaking more of what the railroads can do toward developing their present engineering personnel, R. C. Marshall, Jr., general manager Associated General Contractors of America, said that there still exists a need for the railroads to produce more executives with both engineering skill and a knowledge of business and transportation economics. The difficulties attending future development of railroads as private projects have greatly increased in complexity. These new problems open an extensive field for combined engineering and economic studies. There is every reason to believe that the engineer can take up these studies of railroad building and solve their problems more readily than an executive with no engineering experience. This new field, he concluded, offers an opportunity for development of the highest type of executive ability and with it will go a high degree of prestige and compensation.

The following abstracts of the various committee reports have been made rather to indicate the scope of the committee work than to present the actual data and information.

Reports of Committees

The report of the committee on electricity, of which Edwin B. Katté is chairman, included the result of studies made during 1921 on the subjects of electrical interference, water power, electrolysis, overhead transmission line construction and third-rail and overhead-line clearances. The committee also reported the result of its review of the National Electric Safety Code, issued by the United States Bureau of Standards, submitted railroad specifications for commercial adhesive and rubber insulating tapes, and stated that next year a study will be made of railroad specifications for electric light, power supply and trolley line crossings between steam and electric railways. It is also intended to report on insulators with a view to preparing plans and specifications for standardizing them.

The sub-committee on electrical interference submitted a progress report only, which included tabulations of possible mitigating measures that may be employed, but made no definite recommendations as to their practicability. The committee recommended that the subject be continued with a view to establishing, if possible, remedial measures.

In reporting on the utilization of water power for railroad electric operation, the sub-committee on water power was instructed to co-operate with the United States Geological Survey in its super-power survey. The report on the super-power survey was not available until shortly before the conclusion of the committee's work, so that it was not afforded an opportunity to give the survey the comprehensive study warranted by the importance of the subject. However, the sub-committee did issue a report dealing specifically with sources of electric power available for the operation of railroads within economical reach of the Niagara and St. Lawrence Rivers and tributaries of the St. Lawrence River.

In its summary this water-power sub-committee said that there are at present, at Niagara Falls, hydro-electric developments under the control of the United States totaling 486,000 hp., of which amount practically none is available for railroad electrification. However, there is being developed at Niagara Falls under existing treaty provisions, 660,000 hp. additional, of which 210,000 hp. is on the American side. Of this latter amount, 100,000 hp. is available for railroad electrification and is sufficient for local requirements only. There are possibilities, subject to treaty revisions, of developing on the American side 600,000 hp. additional, of which the greater part may be available for railroad electrification. This would be sufficient to furnish power to a large proportion of the steam railroads within economical transmission distance. There are existing, or under development, other installations such as the Canadian Chippawa-Queenston project and that at Shawinigan Falls. Power from these plants is not available for railroad use in the United States. Other projects are under contemplation, such as the Niagara Falls Union and the St. Lawrence Waterway. While such power would be available for railroad electrification, it is not believed that the projects have yet reached the stage where the committee can report as to their applicability.

The transmission of power developed at Niagara Falls is limited in distance only by ability economically to construct and safely to insulate the transmission line. Also from Niagara Falls, power can be delivered to large consumers within economical transmission distance at approximately 1 cent per kilowatt-hour, which figure is sufficiently attractive, as compared with present costs of steam production, to warrant serious consideration as to its use for railroad electrification.

On the subject of electrolysis, the sub-committee charged with the duty of studying that subject reported that it co-operated during the past year with the American Committee on Electrolysis. The American Committee has completed a comprehensive report which was abstracted on page 913 of the ELECTRIC RAILWAY JOURNAL for Nov. 19, 1921. The committee had

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nothing to report this year as to the effect of electrolysis on reinforced concrete other than to say that experiments are being continued in the laboratory of Swarthmore College and it is hoped that interesting results may form the basis of next year's report on this subject.

The sub-committee on co-operation with the United States Bureau of Standards had prepared a commentary on the National Electrical Safety Code with the object of acquainting the members of the association with the manner in which it can be used to advantage and wherein the code requirements differ from accepted railroad practice. After preparing this detailed commentary, the committee recommended that the railroad specifications for electric light, power supply and trolley line crossings, steam and electric railways, adopted by the association in 1920, be opened for revision with a view to making them conform with the code as far as consistent with established railroad standards, conferring with other interests giving special attention to the following items: (1) A definition of the grade of construction; (2) minimum overhead clearances; (3) clearances between lines and between conductors and supports; (4) minimum size and material of conductors; (5) unit stresses in steel and wooden crossing supports; (6) grounding of arms and guys; (7) grade of construction on branch lines.

After issuing questionnaires to about twenty representative railroads requesting information regarding railroad transmission and distribution lines at present in operation, the sub-committee on overhead transmission line construction reported that some data of interest had been collected. The subject of transmission line standards is extremely active just now. Specifications have been issued or are being considered by several state public utilities commissions, and by various technical organizations. The establishment of common standards for power work and a reduction in the present number of types and kinds of line construction material is very desirable from an economic standpoint and the committee hopes to co-operate with other bodies to promote this result.

Since by far the greatest experience and development in transmission and distribution line construction has been that of electric power companies, it seems probable that types of good construction which have been found satisfactory for them may be adequate for lines of a similar class for railroad use. However, the proximity to railroad tracks presents a hazard to trains from pole and wire failures, which is an important consideration. The most important difference would probably be the fact that railroad lines are usually confined to a restricted right-of-way. Next year the committee hopes to submit some specifications for a standard transmission line construction.

Some interesting data regarding third-rail and overhead clearances were presented in tabulated form by the sub-committee charged with the investigation of this subject. Information about the type of contact, the protection, the mileage in operation, etc., of third-rail lines was tabulated for twenty-five heavy traction and electric railways. Corresponding data of electrified steam roads and interurban lines were listed for the clearance of overhead lines. These data among other things include the size of the conductor and the type of contact device used.

The standardization committee this year presented specifications for friction and rubber insulating tape which it recommended for adoption. These railroad specifications cover completely the material to be used, the manufacture, the chemical properties, the physical properties and tests, the standard weight, dimensions and variation, the packing and marking, and the inspection and basis of rejection.

Way Matters Reported On

The following abstracts cover the reports on track and allied subjects, which for convenient reference have been arranged under committee titles:

Committee on Ballast.—The principal work accomplished by the sub-committee on ballast was a report on time and cost studies covering the application of ballast, giving particular attention to the organization of the ballast gang and also to the organization of small emergency gangs. Some valuable data were presented in tabulated form of the time required, cost of skeletonizing track, of unloading ballast, of placing and dressing ballast, and then in a recapitulation, the cost per mile of ballasting main line track. The committee considers all figures supplied to it to be very creditable. The committee also presented the specifications for ballast shovels. It had also prepared a design for a spot board with the necessary holder and raising block.

Committee on Stresses in Track—A progress report was submitted stating that the principal work of the year 1921 had been the reduction and correlation of data of the field tests made in 1920, the principal purpose of which was to determine the effect of curvature of track upon the stresses in the rail caused by locomotives of different types running at different speed, as compared with the stresses developed in straight track. Another line of work which was carried on was the investigation of stresses developed in the various parts of the rail joint at ordinary wheel loads.

Committee on Rail—This committee reported that it had been giving consideration to the revision of the specifications for steel rails and expects to have something to submit soon. Also during the past year it devoted considerable attention to the details of rail manufacturing practices of the several rail mills of the country, with reference particularly to the influence they have on the properties of the finished rail. It is thought that the most important item in the manufacture that affects the quality of the finished rail is the condition of the steel as it is poured into the mold. The committee found from its annual statistics on rail failure that the war-time rollings and particularly the rails rolled in 1917 are not showing up very well.

On the subject of steel rail inspection the committee presented a résumé of the practices of various roads and also a schedule of recommended practice. In this connection a paper was submitted by M. H. Wickhorst on "A Formula for the Elongation of Rails in the Drop Test." Mr. Wickhorst also prepared a discussion on fissures, which has been revised and the bibliography has been extended five years to include the year 1920.

Committee on Economics of Railway Labor — The problem of furnishing labor for railway service, the committee says, is complicated by fluctuation in the available supply in labor markets, by the seasonal nature of trackwork and especially by that class of extensive improvements usually termed construction work. Because of local weather and climatic conditions, it seems impracticable to recommend a country-wide plan for the permanent employment of laborers in the maintenance of way department, but consideration is recommended for a much broader all-year program of maintenance work and, a permanent force wherever conditions permit.

The conclusions reached were that the best results may be obtained by providing some officer or some organization to supervise the selection and care of employees, that the living conditions of employees should be sanitary and comfortable, and that free transportation for railway labor should at all time be within the control of regularly delegated officers or employees.

Committee on Standardization—This committee was appointed last year to promote the use and formation of association standards by acting as a clearing house for the recommendations of the various A.R.E.A. committees. This year it recommended that five subjects be submitted to the American Engineering Standards Committee as a basis for standardization. Among other things, these include tamping tools, tie specifications, railway lamps and commercial adhesive tape and rubber insulating tape.

Committee on Uniform General Contract Forms — A few minor revisions were suggested to be made in the Manual. The committee has drawn up for adoption a form of license for wires, pipe, conduit and drains on railroad property and has offered for criticism and suggestion a form of license for private road crossings.

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Committee on Signs, Fences and Crossings—On the basis of information obtained by circularizing a large number of railroads in regard to the location of signs with relation to the track, location with relation to the object effected and details of any local state or public service commission laws or orders applying to the location of signs, it was recommended that all mile posts, bridge numbers, section and such signs be located at a distance from the center line of the track to the nearest space or edge of the sign of 10 ft. 4 in. Highway crossing signs should be set at a distance of 17 ft. from the center line of the track and 300 ft. in advance of the crossing. Because of the high price of wood crossing signs there has resulted in recent years the introduction of a number of substitutes. Seventeen have come to the attention of this committee, which grouped them in five classes in accordance with the material of their construction. Information was presented covering ninety-five individual crossings, and data in regard to others were obtained from railroad users and from the manufacturers. For the most part, these crossings have been in use but a short time and a definite conclusion as to maintenance costs and service cannot be reached. Comprehensive specifications were submitted by the sub-committee to which was assigned the preparation of plans and specifications for concrete fence posts. The specifications which it recommends for criticism deal with the materials, the proportioning and mixing of the concrete, the depositing of the concrete, and the curing and handling of the posts. Typical drawings of end posts and brace handles for a right-of-way fence with concrete or steel line posts were included with the report.

Committee on Ties — The specifications for a standard tie and the practice to be followed in its installation were submitted for approval so that there may be some unit of comparison. The recommendation regarding a test installation is that an equal number, though not less than a hundred, standard test ties be installed at the same point in the same track under identical traffic, rails, ballast, drainage and sunlight conditions. The test record should be continued until all standard test ties have been removed as well as all other ties of the test. The standard test tie is to be according to the A.R.E.A. 1921 specifications, grade 3, 6 in. x 8 in., class-U, white oak, 8 ft. long, untreated. A form is provided to record such information as location, kind of ballast, tangent or curve percentage, tie plate, weight of rail, rail fastenings, size and kind of ties, etc. Additional data to be included cover the gross tonnage per year passing over the test ties, the annual average rainfall, the mean temperature of the locality and the kind and depth of ballast.

Some tables have been prepared from the returns to the committee's questionnaire as to the life of ties. The first table concerns untreated ties only, and its information is limited to returns which indicate that the failures were more than half caused by decay, and it is, therefore, an effort to compare the decay-resisting qualities of various kinds of untreated timber. A second table shows the relation between the specific gravity, beam strength and rail-bearing strength of timber used for cross ties, and from it the conclusion can be drawn that the strength of various kinds of timber can be said to vary with the specific gravity.

Conclusions reached by the committee as to the effect of size of ties and the use of tie plates were based on the general belief as expressed in the questionnaires that a tie 7 in. x 9 in. would outlast one 6 in. x 8 in. when subjected to the same conditions, by about 25 per cent. The data relative to ties failing by decay show an average for plated ties of 30 per cent greater life for the 7-in. over the 6-in. ties, and for unplated ties, 20 per cent greater for the 7-in. over the 6-in. It was also found that the value of the tie plate in the case of 6-in. ties is 12 per cent greater life, and in the case of the 7-in. ties, 21 per cent. The greater value of the tie plates with the 7-in. ties may be ascribed to the fact that 7-in. ties are, in general, used under heavier traffic.

There has been very little activity as regards substitute ties during the past year. The test installations as a rule are being continued, but a few have been discontinued. Reports in three installations not heretofore included were made. Two of these installations consisted of but a few ties each, but the third is a 3,400-ft. section of track on the Pere Marquette Railway laid with Kimball concrete ties in a concrete foundation. The ties laid in 1901 and 1902 consist of two concrete blocks under the rails connected with each other by two 3-in. channels and all imbedded in the concrete foundation of the street and track. The ties supported 75-lb. rail, which was changed in 1914 to 90-lb. rail, at which time about 50 per cent of the wood blocks were renewed. Records of the various ties now under test were brought up to date.

Committee on Iron and Steel Structures—The principal accomplishment of this committee during the year was the drawing up of general specifications for the erection of fixed span steel railway bridges less than 300 ft. in length, and the compilation of specific and detailed rules for the design and manufacture of movable railway bridges. These latter specifications are submitted as a conclusion by the committee, which believes them to be the best specifications for movable bridges now available. They are intended to be a guide to both the designer and the shop rather than merely a statement of principles.

Committee on Wood Preservation—Of the different chemical preservatives available the committee stated that there is no question about the use of creosote oil being preferable. Zinc chloride in a mixture with creosote oil is used with much success in certain regions. With present scarcity of creosote oil, economy demands that some other preservative be used. It is imperative, therefore, that the zinc chloride treatment be more widely used. To its report the committee added the record of the completed tests made by the Forest Products Laboratory, Madison, Wis. The summaries of these records for zinc-chloride-treated ties show that the average life for twenty-three test sections in Texas was 8.2 years; for ten sections in California, 9.9 years; for twelve sections in Pittsburgh-Chicago, 9.1 years; for seven sections in Connecticut, 7.1 years; and for six sections in Nebraska, 9.2 years. The average life of twenty-three test sections of ties treated with zinc-creosote in Texas was 12 years. For creosote treated ties no average figure is given, but the life ranges between 6.4 years and 20.2 years for different roads in various parts of the country.

The outstanding development in the preparation of Douglas fir ties for treatment is the perforating process. The machine used for perforating ties was described in the ELECTRIC RAILWAY JOURNAL for April 30, 1921, page 819. The sub-committee has also carried on some experimental treatment on thoroughly seasoned Douglas fir ties, both perforated and non-perforated. The summary of the result obtained brings out that the perforated ties, given the same treatment as the others, show a much higher absorption in volume percentage. Photographs are included in the report which show the uniformity and depth of penetration that this process allows. Other sub-committees have also made extensive studies of Pacific Coast marine piling, preservative treatment to be used on piles and timbers on land construction and methods for storing lumber and piling for air seasoning preliminary to preservative treatment.

Committee on Wooden Bridges and Trestles—The committee has drawn up a plan which it recommended as standard practice for a light and heavy design of open-deck pile trestle. For approval it has also prepared a design for a heavy and light open-deck frame trestle, a multiple-story trestle and a ballast deck trestle. Although in last year's progress report a 12-ft. span was suggested, after careful consideration of the advantages of a 16-ft. span, where flood conditions exist and in zones where Western fir can be readily secured, it decided to include both spans. After considering carefully the loadings, it was decided to keep in harmony with those of the steel specifications, which are Cooper's E-60 and a load which shall not be in any case lighter than three-fourths this amount. For any structures designed to carry more than E-60, steel and concrete of course should be given serious consideration. The exhibits that go with this report are detailed drawings of the various types of

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construction for which it recommends standardization.

Committee on Masonry — Tentative specifications for cold-drawn steel wire for concrete reinforcement have been drawn up by this committee. This covers the customary items of manufacture, physical properties and test, permissible variations in gage, etc. Tables prepared by Prof. Duff A. Abrams were presented as a part of the report. These tables give the proportion and quantities of material, using aggregates of different make-up, for concrete of various strengths and with different degrees of plasticity as measured by the slump test. The purpose of these tables is to furnish a guide in the selection of mixtures to be used in preliminary investigation of the strength of concrete from given materials, to indicate proportions which may be expected to produce concrete of a given strength under average conditions where control tests are not made, and to furnish a correct basis for comparing the relative quantities of concretes made from aggregates of different sizes when the plasticity and strength of the resulting concretes are taken into account.

Committee on Economics of Railway Location—On the effect of curvature on cost of maintenance of way and equipment, the committee has reached the conclusion that it is difficult to present information on this subject that would be of practical value. Its recommendation was that the subject be dropped. The sub-committee assigned to the subject of railway locomotive power is making a study of the various processes for predicting tractive efforts at various speeds, in the expectation of revising where necessary the present section on power in the Manual.

Committee on Shops and Locomotive Terminals—Of interest to electric railway men, perhaps, is the report of the sub-committee on passenger repair shops. It stated that the shops, yards, buildings and machinery should be arranged so that the various operations follow through in a logical sequence. The bad order equipment should pass in at one point, progress by various steps, without hindrance from congestion or awkward movement, over a predetermined circuit to the point of release, and emerge as a finished product. In general repair work a car will enter the shop, be unwheeled and stripped, after which the car, trucks and trimmings will progress through the shop, each over a different route, and will finally meet at some point for trimming, assembly and release. The committee also made some general comments and recommendations for the various shop subdivisions which go to make up a large passenger shop layout. In connection with this study the committee added comments on special features of some existing plants which are of considerable value.

Committee on Track—Ten plans for bolted rail crossings and eighteen plans for manganese steel insert crossings were submitted for adoption. Valuable work has been done along the line of providing specifications for track tools. Plans were submitted for a pinch bar, lining bar, claw bar, track wrenches, adze, rail fork, spike pullers, track gage, rail tongs, track chisel, clay pick, spike maul, sledge, track level and track shovel.

Two tables were the result of the work of the sub-committee on gages and flangeways for curved crossings. The first one gives the approximate rigid wheelbase of locomotives in combination with the number of pairs of flanged drivers that will operate on the gage of track with curvature ranging from 6 to 33 deg. The purpose of the second table is to give the more nearly exact gage necessary for a given locomotive on a given curve. The figures have been verified by some observations and some comparisons with actual practice and conditions.

An investigation on the possibility of canting the rail inward revealed the fact that the Canadian Pacific Railway has used tie plates since 1914 which are inclined to a slope of 1 in 20, and that it is securing excellent results in so far as the wear on the head of the rail is concerned. Reports of continued tests on the Pennsylvania System indicate slightly more wear on the rail head with the inclined plate, and that there was practically no difference with regard to cut ties as between the inclined plate and the standard level plate. Neither of these installations had any special construction of frogs, switches and turnouts with inclined rail. In view of the fact that foreign practice is reverting to laying rails in the upright position, no definite conclusions were drawn on this subject. In regard to the reduction of taper of wheel tread the New York Central Lines are reported to have changed the slope from 1 in 20, which is the M.C.B. standard, to 1 in 38, which has been found a more favorable contour.

Committee on Roadway. — The sub-committee on shrinkage and swell of grading material found nothing that would lead it to change any conclusions previously made on this subject. It added that it seems to be impossible to find any rule for the swell of grading material, but it seems that the method of handling has considerable to do with the result secured. In regard to sliding of cuts and fills, the conclusion reached was that the primary cause of slides is the lack of proper drainage. In the construction of a new line where conditions indicative of future trouble with soft spots or slides are encountered, special attention to the diversion of the springs or streams which are likely to cause trouble should be given.

On investigating the chemical killing of weeds, the sub-committee found that the chemical mostly used is a mixture or compound of arsenic and caustic soda, using 8 to 10 per cent of the latter by weight and dissolving the solid chemicals in water. The application is made on any desired scale from a handcar, single flatcar, or an entire train, all with proper equipment. A very convenient unit of measurement is 1 gal. of solution per foot of width per mile of roadbed, which appears to be ordinarily within the limits of 5 and 15 gal.; or a minimum application of 5 gal. per width of 8 ft. will take 40 gal. per mile, while a maximum application of 15 gal. per foot for 14 ft. width will take 210 gal.

Some roads also claim that the weeds should be allowed to attain their full growth before application, while others advocate applying the chemical to the growing weeds in order to eliminate them from the roadbed during the summer season. One road reports that after four years application it was decided to discontinue entirely the use of the weed killer and to resort to the weed burner, claiming that the weed killer did not destroy all the weeds and that those that did succumb were dried and left to foul the ballast.

Committee on Economics of Railway Operation—It has been found by the sub-committee on methods for increasing the traffic capacity of a railway that train operation can be represented by a mathematical law. The complete development of this law is included in the report. Its application to different sets of observations make possible a comparison of several months operation of a given division on a more equal basis.

By comparisons like this it is felt that the result of extreme weather conditions, greater track facilities, characteristics of motive power, character of commodities, supervisory methods and the average time on the road can be more accurately determined. An exhibit added to the report shows how closely actual conditions can be forecasted by application of the mathematical theory.

Committee on Rules and Organization — In connection with the use of mechanical appliances and tools with organization of labor involved, this committee has compiled some information on the use of machines and combinations of machines for doing special work. These include the methods used and cost of spreading ballast with a tie scraper and with a snow flanger. Also valuable data were given on the use of a gravel ballast unloader, pneumatic tie tampers, bonding machines, a rail handling machine, and ballast cleaning machine.

A.S.M.E. Spring Meeting at Atlanta

THE spring meeting of the American Society of Mechanical Engineers will be held in Atlanta, Ga., May 8-11. Preliminary events will take place at Charlottesville, Va., May 6 and 7, in co-operation with the A.S.M.E. Virginia Section. Immediately following the Atlanta meeting observation tours will be made to points in the South, including Birmingham, Greenville, S. C., Muscle Shoals and Pensacola, Fla.

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New Englanders Discuss World Problems

At Annual Meeting of New England Street Railway Club, Men Prominent in Public Life Outline Problems of Reconstruction Period—Reports Showed Club as Prosperous—A. E. Potter Elected President

FOUR HUNDRED AND FIFTY members and guests of the New England Street Railway Club listened intently to addresses upon the great economic problems of the age in general and their local application at the twenty-second annual banquet of the organization, which was held on March 23 at the Copley Plaza Hotel in Boston. The club is in a most flourishing condition, 117 new members having been added during the year, while the cash balance reported in the treasury is $3,900. During the usual business meeting preceding the banquet, A. E. Potter, president and general manager United Electric Railways, Providence, R. I., was elected president of the club for 1922-1923. By a rising vote, every member pledged his support to the new administration.

Hon. Samuel L. Powers of the board of trustees, Boston Elevated Railway, officiated as toastmaster after being introduced by the retiring president, Edward Dana. Hon. Channing H. Cox, Governor of Massachusetts, congratulated the club on its growth and influence and urged the membership to join as citizens and as a group with others in seeking the just interests of New England in the matter of transportation rates and other problems of importance to the Northeast. An honorary member of the club, Governor Cox was received with great enthusiasm.

Service as the motto of the electric railway industry, and particularly as exemplified locally, was attested by Hon. E. Mark Sullivan, corporation counsel of the city of Boston. In the absence of Mayor Curley, Mr. Sullivan welcomed the members to the New England capital, paying high tribute to the efforts of Chairman James F. Jackson and the other public trustees of the Boston Elevated Railway to give the Boston metropolitan district a great transportation system. The open-handed policy of this board in giving out figures upon the road's operations and explaining its economic problems, said the speaker, is winning the tolerant sympathy and confidence of the public. The policy of explaining these matters in simple, straightforward ways, he declared, will make friends of the people. Even under present trying conditions of rush-hour crowding, the good nature of the car-riders is evidently in part due to a recognition of the efforts of the trustees and their associates to provide good service under conditions frankly placed before the public.

Gen. Guy E. Tripp, chairman of the board Westinghouse Electric & Manufacturing Company, New York, reviewed the situation in Europe from the reconstruction standpoint, emphasizing the need of removing continental trade barriers artificially set up, of reducing the excessive costs of state administration, and of stabilizing the currency and balancing governmental budgets. Until these countries live within their incomes, the speaker said, no reduction in their financial obligations to the United States should be considered seriously. A more extended résumé of General Tripp's address will be published in a later issue of the ELECTRIC RAILWAY JOURNAL.

Hon. John H. Crim, assistant attorney-general of the United States, was the last speaker. He made a strong plea for active participation by business men in government and condemned the tendency toward over-centralization of governmental functions at Washington, with its dangers of developing a reckless bureaucracy. Already federal officials are staggering under many burdens of local importance to the enforced neglect of national affairs. The terrible example of Russia, the speaker said, should suffice for the proletariat nearer home. Optimism in the ability of the American business man to solve his governmental problems was emphatically voiced by the speaker.

Following an invitation by A. Gaboury, Montreal, to the club to attend the eighteenth annual convention of the Canadian Electric Railway Association, June 1-3 at Quebec, the meeting adjourned.

During the afternoon business session the following officers were elected to serve during the coming year: President—A. E. Potter, Providence, R. I.; vice-presidents—Massachusetts, Ralph D. Hood, Haverhill; Connecticut, W. J. Flickinger, New Haven; New Hampshire, T. H. Kendrigan, Manchester; Vermont, T. B. Jones, Burlington; Maine, Fred D. Gordon, Portland; Rhode Island, Edward A. Brown, Newport; secretary—John W. Belling, Boston, Mass.; treasurer—Fred F. Stockwell, Cambridge, Mass.; executive committee—Edward Dana, Boston; Charles H. Wood, Boston; W. W. Field, Cambridge; F. B. Walker, Boston; George H. Martin, Boston; George H. McFee, Framingham; L. D. Pellissier, Holyoke. Finance committee—A. E. Potter, W. C. Bolt, H. B. Potter.

American Association News

American Association Executive Committee

THE March meeting of the executive committee of the American Association was held at New York headquarters on March 24. There were several of the usual routine reports of the executive secretary and some of the committees, including a financial report showing the cost of the midyear dinner. This proved to be about 60 per cent of the cost of the 1921 dinner.

In his report for the committe on national relations, Charles L. Henry said that there were three things of present interest in this field: The interchangeable mileage-book bill, the Bacharach bill, and an investigation of power brakes by the Interstate Commerce Commission.

As to the mileage-book question the committee hopes that it will be provided that railways which wish to take advantage of the joint mileage book may do so. The Bacharach bill is one which would provide that no recourse may be had by a public utility to any federal court in a question of rates until all possible steps provided by state law have been taken.

The power brake investigation is one which will apparently not affect electric railways, but only the question of heavy trains on steep grades.

Reporting for the publicity committee J. N. Shannahan said that its principal activity was in assisting the committee on co-operation with manufacturers. He reported very favorable results on the nation-wide publicity obtained for the Midyear Meeting.

With reference to the location of the 1922 convention, to be held in October, the executive committee, after a long and careful analysis, approved the report of the location committee. This recommended that the convention be held in Chicago, with exhibits, on the Municipal Pier. The recommendation of the sub-committee was reached at a largely attended meeting held in Chicago, March 15 and 16, with H. H. Adams presiding. The executive committee also authorized the appointment of a director of exhibits.

The executive committee passed a motion instructing the Engineering Association to appoint a committee on the cost of highway construction and maintenance. This was done in the belief that this is a subject related to bus transportation, about which the association should have information.

On recommendation of Mr. Palmer there was authorized the appointment of a committee to confer with a committee of the National Safety Council on problems of mutual interest. The executive committee then adjourned to meet in Baltimore, Md., on April 28.

Those in attendance at the meeting included: President R. I. Todd, J. N. Shannahan, C. S. Kimball, L. H. Palmer, F. E. Webster, C. L. Henry, L. S. Storrs, H. G. Bradlee, W. H. Sawyer, R. P. Stevens, J. G. Barry, C. R. Ellicott, J. R. Welsh and M. B. Lambert (guest).

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

City Wins New Orleans Case

Court Blocks Attempt by City to Conclude Negotiations Looking Toward Settlement of Railway Dispute

The State Supreme Court of Louisiana on March 20 handed down an opinion dismissing the suit for an injunction sought by the state to prevent the Municipal Council of New Orleans from making an agreement with the New Orleans Railway & Light Company permitting the collection of a higher rate of fare than 5 cents. This is the rate fixed in the original franchises held by the company.

The judgment of the court was unanimous. The court held that the Attorney General on behalf of the State had no cause or right of action and for this reason the State Supreme Court affirmed the previous judgment dismissing the suit.

In reviewing the case Justice O'Neil says the question presented is whether or not the authority to fix the fare in New Orleans is vested in the Municipal Council or in the Louisiana Public Service Commission. The authority of the commission, created in 1921 with the power of supervision, regulation and control over local public utilities, powers which its predecessor, the Railroad Commission, did not enjoy, is qualified by the expression in the law, "except as herein otherwise provided." And Section 7 of the same article declares that "the powers of supervision, regulation and control over any street railway, or other public utility now vested in any town, city or parish government" shall not be vested in or exercised by the Public Service Commission unless or until a majority of the qualified electors . . . shall vote to surrender such power."

No such election has been held in New Orleans. Justice O'Neil declares further that it is not pretended that the Legislature has deprived the municipal government of its rate-making authority over street railways or other local public utilities, since the railway franchises, which were the subject of the litigation, were originally granted by the Municipal Council.

The State of Louisiana has fifteen days within which to ask for a rehearing, but it is not likely that Attorney General Coco will take this step in view of the unanimity of the opinion of the state court of last resort. This decision practically settles the suit of the State in the United States Supreme Court, since the cause of action for the forfeiture of the franchise has been settled by the decision of March 20 by the State Supreme Court. It is expected the decision in the case pending in the United States Court of Appeals, on appeal from the district federal court, where a ruling was rendered favorable to the railway, will follow along the lines of the opinion in the State Supreme Court.

Commissioner Paul H. Maloney, of the Department of Public Utilities, has wired G. M. Dahl, of the Chase National Bank, New York, to return to New Orleans. The idea now is to resume the negotiations which were abruptly broken off last August when the restraining order was issued by Judge Provosty of the State Supreme Court. At that time the negotiations with the Commission Council and the security holders had resulted in an agreement for the reorganization and refinancing of the company. This agreement provided for a 7-cent fare and gas at $1.30 per 1,000 cu.ft.

The suit instituted by the junior security holders in the federal court, by which body the receiver was appointed and is now exercising authority, will have to be dismissed. Among the steps to be taken in connection with this phase of the matter will be the sale of the property under foreclosure and the discharge of the receiver.

Announcement was made by Receiver O'Keefe, who has just recently returned from New York, that arrangements have been made with representatives of the security holders to extend more than $1,000,000 of certificates which fall due in April and to place an additional $1,000,000 of certificates to pay for improvements already under way.

It is expected that it will take all of six months more to effect all these arrangements.

Looks Into Future—Sees Public Ownership of Trolleys

Public ownership of electric railways is inevitable. This was the judgment delivered by Peter Witt in a talk made recently before the Get-Together Club in the Hotel Bond, Hartford, Conn. Municipal ownership had come in San Francisco and in Seattle, was at hand in Detroit, and was due in Cleveland, in a future not far distant, he said. The transportation of the future was to stick to steel wheels.

Harrison B. Freeman, receiver of the Hartford & Springfield Street Railway, was toastmaster. He said that an electric railway must have the good will of the public and the co-operation of the public officials. Mr. Witt sees the day ahead when the electric railway will be free to taxpayers in the sense that the public will own the trolleys just the same as it owns the highways.

Lucius S. Storrs, president of the Connecticut Company, said that a transportation utility was a semi-public enterprise run by a private corporation charged with a public function.

New York Legislative Session Disappointing in Some Respects

The Legislature of New York adjourned on March 17. The session of 1922 was one of the shortest on record. Backed by a heavy Republican majority in both houses, Governor Miller's entire program as outlined in his message to the Legislature was written into law.

Measures involving public utilities were killed during the last minute rush. Among these measures were bills outlawing one-man cars, repealing the full crew law and relieving traction companies from paving charges. The New York city fare bill is referred to elsewhere in this issue.

Governor Miller's water power development program was approved. The first law provides for private development of the State's water power resources under supervision and control of the Water Power Commission and the Public Service Commission. The second law provides for State development or surplus canal waters, the initial development to be at Crescent Dam and Vusichers Ferry, near Schenectady.

The Port Authority program favored by Governor Miller and Alfred E. Smith, former Governor, was adopted for New York City over the protests of the Hylan administration.

Some of the measures passed by the Legislature and now in the hands of the Governor as thirty-day bills follow:

The Gibbs bill (Senate Print No. 804): Adding new section 67 transportation corporations law by permitting construction of electric lines over Indian reservations. The construction contemplated is in Erie County.

The Lowman bill (Senate Print No. 378): Amending Section 93 railroad law providing new provisions for maintenance of bridges over railroads.

The Dick bill (Senate Print No. 904): Adding new subdivisions 9, 10 and 11 Section 49 public service commissions' law, defining service-at-cost contract, authorizing municipal corporations of less than 1,000,000 inhabitants and street surface railroads to enter into such contracts, and providing that a domestic railroad corporalic service commission.

The Kavanaugh bill (Senate Print No. 741): Adding new section 160 railroad law, providing that a domestic railroad corporation, other than a street railroad owning at least three-fourths of capital stock of another domestic railroad other than a street railroad, may acquire minority stock of such other railroad on an appraised valuation in aid of merger.

The Jesse bill (Senate Print No. 1659): Amending Section 183 railroad law, by permitting a street surface railroad to operate in any city by underground electric power to use tracks of other street surface railroads for not exceeding 2,500 ft. under certain conditions.

All of the special bills requiring certain street surface railroads which formerly operated between New York and Brooklyn to restore service failed of passage, although one or two of them passed the Assembly.

The Duell bill providing industrial courts for the settlement of disputes between capital and labor was killed.

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Columbia Situation Clearing Up

Company Has Police Protection and Operates Under Railroad Commission's Orders

Events in the labor situation in Columbia, S. C., have moved rapidly during the past week. It will be remembered that car service stopped on Feb. 15, when the employees went out on strike because the company would not agree to refer all discharges of employees to arbitration. At the time last week's issue of this paper went to press, the Legislature had adjourned after increasing the Board of Railroad Commissioners from three to seven members, but the company was prevented from hiring new men to operate its cars because of an existing city ordinance.

This ordinance, which was passed in 1917, forbade the employment of any motorman or conductor on a street car within the city unless he had received instructions on the cars in Columbia for the fifteen days immediately preceding the time of assuming his duties, the instruction to have been given by a motorman or conductor who had been actively employed in such capacity in Columbia for the six months immediately preceding.

Railroad Commission Acts

Promptly last week after its appointment the new Railroad Commission, consisting of seven members, organized and ordered "The Columbia Railway, Gas & Electric Company to resume its street car service as soon and in such a manner and to such extent as it may be able, exercising due care and caution to employ such motormen and conductors as may be qualified and capable of operating its cars, and failing so to do, that it show cause why it has not done so or why it should not be peremptorily ordered to do so before this commission."

This order was issued under the authority granted under section 6 of the new railroad law which provided:

"The Railroad Commission is hereby vested with power and jurisdiction to supervise and regulate the rates and service of every public utility in this state and to fix such just and reasonable standards, classifications, regulations, practices and measurements of service to be furnished, imposed or observed and followed by every public utility in this state."

Company Operates Cars

The company, therefore, on Monday morning, March 20, having recruited some new men, started operation. Up to 3 p.m. there was little disturbance, but by that time strike sympathizers gathered and began to make raids on a number of cars. As a result two operators and one passenger were injured so severely that they had to be taken to the hospital. The police arrested three strikers, members of the union, and one strike-sympathizer for these disturbances. Late in the afternoon of Monday the cars were withdrawn until Tuesday morning and an appeal was made to the Governor for protection. The Governor said that he would do this, "even though the entire law enforcement force of this state, including the National Guard, be necessary to guarantee this protection . . . The company has a lawful right to operate its cars in peace and security, all the more so since this operation is being undertaken at the order of the State Railroad Commission."

City Acts to Stop Violence

On March 20, the day that car operation was begun, a body of the strikers appeared before the Council to ask that the ordinance of 1917 be enforced. They were rather taken back, however, when the city attorney, C. S. Monteith, declared that the State legislation increasing the powers of the Railroad Commission and the order of that commission had nullified and superseded the city ordinance which specified the qualifications of motorman and conductors, that the matter was now entirely in the hands of the commission, and that it was the duty of the city to afford police protection so that the company could resume its service.

After a consultation between the Mayor and chief of police on March 20 in regard to the best method of protecting of the cars, it was decided that each car would be convoyed by six police, five riding in an automobile behind the car, while a sixth followed on a motorcycle. On arrival at the city limits the protection is taken by rural policemen and sheriff deputies, convoying the car in the same way. The Mayor authorized the Police Department to engage any number of special policemen necessary to keep order. The Mayor said:

"Columbia police must protect the citizens and their property, and if we cannot do our duty we should step out and let others in who will."

On March 21 the board of directors of the Columbia Chamber of Commerce in open meeting passed a series of resolutions which, while expressing no opinion on the merits of the controversy, condemned the attacks on cars that had taken place, indorsed the steps taken by the city and county officials to prevent their recurrence and called upon the members of the union and their sympathizers to refrain from acts of violence.

The operation of the cars was conducted for seven hours on March 21 without any recurrence of violence. The police guard arranged for protection proved effective.

The four rioters who were arrested on March 20 were arraigned on charges of assault and battery with attempt to kill and were bound over for trial under bail bonds of from $1,000 to $3,000. Three more arrests were made for the disturbances on the previous day. It also developed that two of the cars attacked on March 20 were carrying United States mail, which the company had contracted to deliver and that the Federal authorities had asked for information from the company as to the attacks on these cars.

On the afternoon of March 21, F. H. Knox, president of the company, issued a short statement expressing thanks to the state, county and city officers for the protection given to its patrons, employees and property. At a meeting of the union held on the evening of March 20, while no official action condemning the use of force was taken, the speakers, according to the president of the union, urged the men to refrain from attacks upon the cars.

Development Depends on Public Attitude

The best bet for the development of water power in Georgia is a favorable public attitude, from which will result private enterprise, according to Preston S. Arkwright, president of the Georgia Railway & Power Company. President Arkwright addressed members of the Rotary Club of Rome recently on the subject of water power development.

In spite of apparent opposition, what business men really want, said Mr. Arkwright, is the development of water powers and their use electrically. The company wants the water powers developed too, said Mr. Arkwright, and for this has fought constantly during its ten years' existence against a public opinion unfavorable to such projects. He asked the men to take an unprejudiced attitude.

Whoever can carry on the work most capably should do so, stated Mr. Arkwright, whether it be the Georgia Railway & Power Company or some other concern.

Boston Paper Talks About Trolleys

The Boston *Traveler* commenced on March 22 the publication of a series of seven articles on the trolley situation in Boston. It is in the form of questions and answers and began with the statement that there had been so much discussion on the subject of a 5-cent fare that the paper decided to get the entire story. When it began its investigation it was amazed to find that specific information could be got only from the public trustees and management of the elevated. Others contented themselves with the statement that there ought to be 5-cent fares, but when pressed for details became very hazy.

The paper declares it could not find, among the responsible and well-informed critics of the present public control law, any who would offer a definite substitute or definite plan for 5-cent operation. This applied even to the Mayor, who says that the fare should be a nickel, but has offered no remedy beyond a call for legislative action and saying that he thinks the situation a problem "for the best legal minds in the community."

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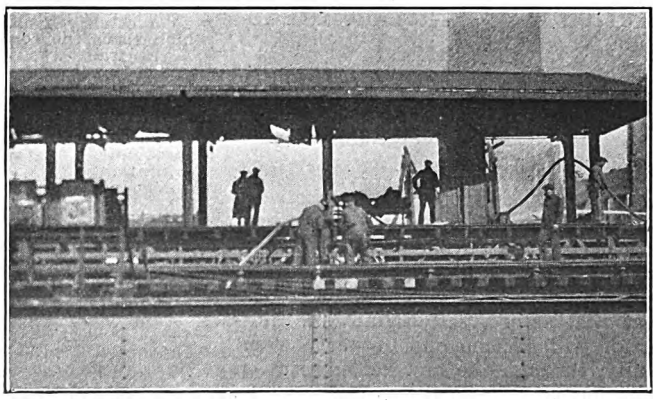
STEPS TO ELEVATED WRECKED



STATION PLATFORM BADLY DAMAGED

Fire Ties Up Chicago "L"

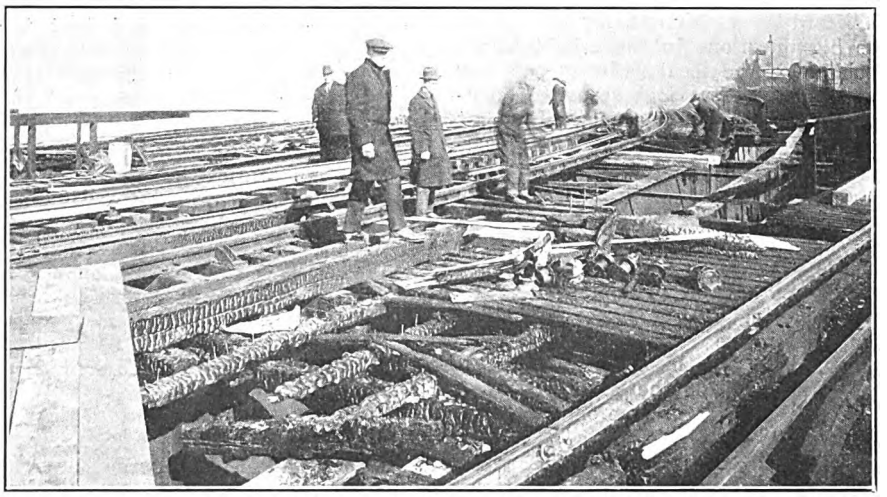
Platform and Ties Destroyed Following Collapse of Building in $8,000,000 Fire Which Wiped Out a Block

Service on the Metropolitan-West Side Elevated Railroad, Chicago, was seriously crippled on March 15 by an $8,000,000 fire which wiped out the block of buildings surrounded by Jackson Boulevard, Van Buren, Canal and Clinton Streets. The Canal Street station of the elevated, which is located in the center of the block, was demolished and the platforms and ties set on fire by the collapse of an adjacent building.

The steel elevated structure and the canopy and platform on the north side suffered the most severe damage, because they received the full blast of the fire from the immediately adjacent burning buildings. The rails of the two north tracks were warped and the ties burned out so that the track was impassable. The intense and continued heat on that side caused several girders to sag, and in all about ten will have to be replaced as well as about 2,000 ties. The total damage to the "L" is estimated at between $75,000 and $80,000.

From 1 a.m., when the fire started, until 5 p.m. the same day trains of the Garfield Park, Douglas Park, Logan Square and Humboldt Park elevated lines and the Aurora, Elgin & Chicago Railroad were unable to come further toward the Loop than Halsted Street. However, passengers were brought to the Loop by routing all Metropolitan trains north from the Marshfield Ave. Junction to the Lake Street crossing with the Oak Park Elevated, to which passengers were transferred and carried to the Loop on special trains. At 5 p.m. the two south tracks were repaired and direct loop service was restored. At present the Clinton Street or west end of the station has been arranged for temporary use with a runway from the street. Practically normal service is now being operated over three tracks.

While the firemen were still pouring water into the ruins three or four hundred men were at work replacing the charred ties and warped rails on the two south tracks. These, as was mentioned before, were made safe for travel at 5 o'clock the same day.

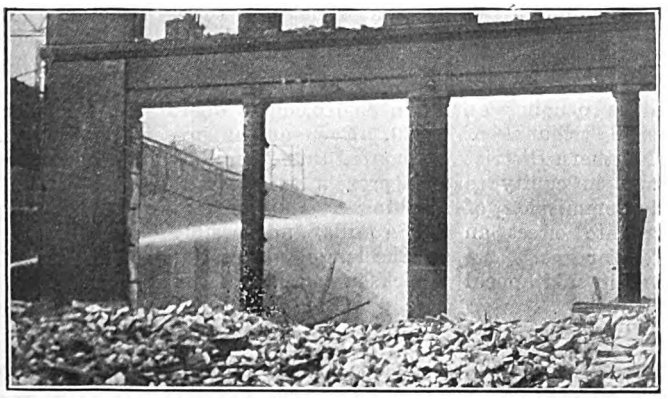


CHARRED TIES AND STRINGERS ON CHICAGO ELEVATED STRUCTURE

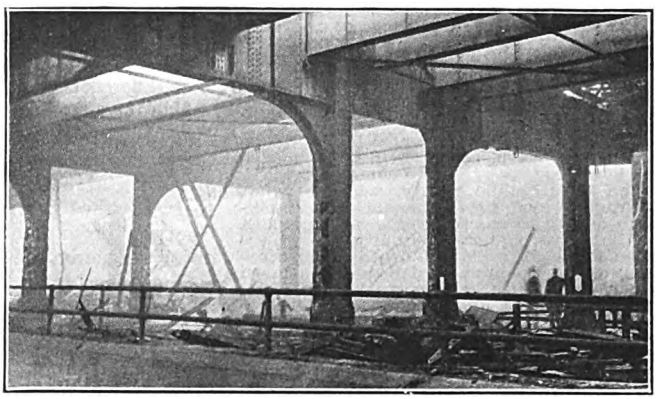
It will probably be impossible to place the fourth one in commission until the new steel girders are received and installed. Orders for this steel were placed by the engineers of the elevated road at 8 o'clock the morning of the fire.

The accompanying views give some idea of the extent of the damage and the measures taken to restore service.

Will Consider New Wage Scale.—On April 1 the matter of a new wage scale for trainmen of the Seattle & Rainier Valley Railway, Seattle, Wash., will come up for settlement. The company has announced that on that date it desires to put into effect a maximum wage scale of 58 cents an hour, to replace the present maximum of 62 cents, which was adopted several months ago to serve as a temporary adjustment.



STRUCTURE CAUSED TO SAG BY INTENSE HEAT



WRECKAGE UNDER THE ELEVATED STRUCTURE

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Pittsburgh Traction Plans Explained

President Thompson Addressing Chamber of Commerce Outlines Changes to Result from Reorganization.

In an address before the Pittsburgh Chamber of Commerce during the week ended March 11 A. W. Thompson, president of the Philadelphia Company, speaking on "Problems of the Pittsburgh Railways," assured members that the many traction lines in Pittsburgh will become one property eventually, through the new reorganization bond plan. One of the next big steps to be taken is the sale of $5,000,000 of bonds in the Pittsburgh district.

He said a public utility must enjoy the good will of the public, for a banker and investor will not continue to invest or loan money to a company with which the community is unfair and upon which unjust burdens are placed. He said people willingly paid an increase in a few years from 5 cents for seats in "movies" to 10, 20, 30 and even 40 cents, and stood for a 40 per cent increase in steam railroad fares.

According to Mr. Thompson one of the big questions in the rehabilitation problem of the local railway was how to take care of various securities coming due, failure to meet any issue at maturity generally meaning foreclosure. It is proposed to provide for retiring these issues as they come due with a new class of bonds covering one property for the purpose of exchange with the old bonds. These new bonds are to be issued under a mortgage covering all the properties, which comprise more than 100 separate companies. As these various issues are exchanged for the new bonds the traction lines will become one property eventually.

Mr. Thompson said that for more than ten years active discussion of the railway subject has been before the Chamber of Commerce, mostly because of inadequate service. During this period $750,000 had been expended in making reports, investigations and a valuation. Nineteen separate reports were made during this period, with the final result of receivership, four years ago. Inadequate service still prevailed. Because of the lack of co-operation between the management of the railways and the people of Pittsburgh, brought about through an absence of understanding of the difficulties, these difficulties gradually increased until the railways lost credit and were unable to finance improvements. In continuing Mr. Thompson said:

A live, modern public utility is one of the best assets of any community. A broken-down public utility, without funds to provide modern equipment and facilities, and without any means of financing, is a liability to any community.

You know as well as I do that the prosperity of any community depends in a large measure upon its transportation facilities The prosperity of any community is, therefore, bound up with the ability of the street railways to render adequate service.

A proposition was made to the Mayor and City Council to join in a conference to see if something could not be suggested and started with a view to giving Pittsburgh the same type of service that the city was receiving from other public utilities which serve the community.

A contract was rounded out which had the semblance of being practical and could be put into effect. It soon was found that the most difficult problem was the question of credit; that without new capital for purposes of buying equipment and making improvements, as well as for general rehabilitation of the lines, a success of the transportation system was impossible.

The contract was changed somewhat, the results of which are shown in the approval of the contract by the Public Service Commission. I think the Mayor and the Council, with others of the present city administration are in earnest in making the new transportation company a success.

Some events in the affairs of the city stand out like milestones along a highway. This agreement seems to be one of those milestones. From every point of view it seems to be democratic, fair, reasonable, and, above all, hopeful for the future intercity transportation, as it aims to promote progress; it strives to lighten the burdens of the car rider; gives a square deal to the security holders, many of whom are Pittsburghers, as well as provides for thorough co-operation between the municipal officers and the railway officers.

The spirit of the Pittsburgh Railways agreement is the important thing. Words often fail to express the underlying intention. Difficulties may arise in the interpretation of the agreement, but if the people of Pittsburgh and the railways management always will remember that it was entered into in a spirit of co-operation and good will, and always strive to keep that spirit alive, all difficulties will be surmounted.

Here Mr. Thompson said that the financing of $5,000,000 for extensions and improvements was the one step that remained in the closing of the contract with the city. It was absolutely necessary to secure this amount to make a success of the transportation system. It was proposed that this amount of bonds should be sold in the Pittsburgh community, and that the backing of the Chamber of Commerce, together with the backing of the various boards of trade, civic bodies, municipalities and others, be secured in order to effect a proper distribution of the bonds.

Mr. Thompson said that with the new franchise contract in force, many banks have stated their willingness to advise their patrons of the soundness of the bonds which it is proposed to issue. The securities to be offered will be in denominations from $50 to $1,000.

Important Questions Referred to Supreme Court

A number of questions affecting vitally utility valuations may be considered by the Supreme Court of the United States in the case of Georgia Railway & Power Company, Atlanta Gas Light Company, appellants, vs. Railroad Commission of Georgia, et al., appellees. A speedy hearing on this case has been urged by both parties.

The case mentioned is pending on appeal from the special tribunal of three judges from the Northern District of Georgia, being a suit in equity to restrain the Railroad Commission of Georgia from putting into effect an order reducing the rates for gas.

The questions involved in said appeal are as follows:

(a) Whether the State Railroad Commission, in fixing the present value of property, has the right to disregard the advance in value since 1914.

(b) Whether it is the duty of the State Railroad Commission, in fixing the value of the property of public service corporations, to consider the value of the special franchises thereof.

(c) Whether the normal federal income tax should be included as part of the operating expenses of public service corporations.

(d) Whether the original cost of financing should be considered by public service commissions in fixing the value of the property of public service corporations.

The appeal to the Supreme Court, in which both sides join, declares that the matters involved are of great public interest, in that these same questions occur in a very large per cent of the cases before public service commissions, and the determination of these questions is of pressing importance not only to the public service corporations, but to the State as well. Again the inferior Federal Courts are not in accord in their answers to the questions involved. Finally, the appeal says, the Railroad Commission of Georgia has now pending before it a number of cases in which these question are involved and it is of vital importance to this State tribunal that they should be speedily settled.

The assignments of error on which the company based its appeal were referred to in the ELECTRIC RAILWAY JOURNAL for March 4, page 380.

Strong Opposition Voiced to Maintenance by Taxation

The proposed plan of Councilman C. J. Erickson, which is to be presented to the voters at the coming city election, and which provides for the maintenance of the Seattle Municipal Railways by taxation, is meeting with widespread opposition among business men and taxpayers in the city. A body recently formed, known as the League Opposed to Maintaining Public Utilities by General Taxation, has opened offices at 303 Securities Building and is conducting an educational campaign against the movement. The campaign has been indorsed by the board of trustees of the Seattle Chamber of Commerce. The league has issued a statement calling attention to the fact that during 1922 it will cost approximately $5,100,000 to maintain and operate the municipal railway lines.

Erickson claims that under his plan, which is guaranteed to reduce the fares to approximately 3 cents, there will be an increase in travel of at least 20 per cent, which, it is stated, means an increase of not less than 10 per cent in the operating cost. This means, according to the league, that under the Erickson system it will cost not less than $5,610,000 to operate the lines in 1923. Even at the present cost, it is estimated that 21 mills will be added to the present total tax rate of 63 mills, making a minimum total tax in 1923 of 84 mills, and possibly more.

The league also estimates that if the Erickson plan is favorably voted at the city election it will mean the indefinite suspension of projected improvements totalling more than $10,000,000 and will cut building operations 50 per cent.

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Men Plan Wage Agreement at Schenectady

Delegates representing the employees of the electric railway companies of Schenectady, Rochester, Utica and Syracuse ended a two days' session at Schenectady on March 21 by completing the drafting of a blanket agreement governing wage scales and working conditions in the four cities. The tentative draft will be presented to employees in the several cities for amendment or ratification on the following dates: March 23, Utica; March 24 and 25, Rochester; March 27, Syracuse; March 28, Schenectady.

The board drafting the agreement will meet on March 30 at Syracuse to perfect the final draft by incorporating amendments which may be decided upon by the several locals. The amended agreement will be presented to the several traction companies April 1, and if accepted by the companies will be effective May 1, for a year. Officials attending the conference refused to make public the details of the agreement, but it is learned that it calls for the continuance of the present wage scale in each of the cities, 50 cents an hour in Schenectady and 52½ cents in the other cities. It is also stipulated that a higher wage must be paid the operator of one-man trolley cars. This type of cars is operated in Schenectady, Utica and Syracuse. No draft of changes in regard to working conditions was made, it is said.

Accident Bonus Starts for Georgia Railway

A bonus accident plan, whereby each trainman of the Georgia Railway & Power Company, Atlanta, will receive $3 for each month in which no avoidable accident is charged against him, has been announced by F. L. Butler, general operating manager. The bonus, which is open to all trainmen, regular or extras, who work at least twenty-five days of the month is payable quarterly.

The company has classed all accidents as "A," "B" or "C." "A" accidents are those for which the trainman is not to blame, Class "B" accidents are those which could have been prevented by extraordinary care. The motorman must make allowance for possible carelessness of the other person and try thus to prevent the accident. This class of accident will not call for discipline, but will prevent the trainman from getting his bonus. Class "C" accidents include those for which the trainman was responsible. A "C" accident against a man will automatically prevent him from getting his bonus, and will carry with it demerits, suspension or dismissal.

The plan goes into effect April 1. In the booklet which introduces the plan to the trainmen certain types of "B" and "C" accidents are specifically mentioned. Some of these are collisions between cars, collisions at steam railway crossings, collisions with automobiles and other vehicles, collisions with pedestrians, motorcycles and bicycles, collisions with animals, horses, cows, mules etc., and derailments. They are in almost every circumstance to be held against the trainmen. The closed type of car practically eliminates accidents to persons boarding moving cars, or alighting from them. The trainman is held responsible to see that passengers do not board or alight from an open car while it is in motion. Accidents to persons boarding cars at rest or alighting from cars at rest are generally classed as "A" accidents, if the trainman shows that the car was at rest, and that he did not try to operate the door while passenger was boarding.

Bankers Indorse Certificates for Subway Construction

New impetus was given on March 16 to the proposal for municipal ownership of the surface and elevated railways of Chicago. On that date the report was presented from a committee of bankers on the "public utility certificates" proposed to be issued under the plan of Alderman Schwartz. This plan has been mentioned several times in the ELECTRIC RAILWAY JOURNAL. The companies had practically agreed to the proposition if a purchase price could be fixed and if the certificates were found to be salable. The bankers gave their indorsement, subject to court approval, to the certificates. They thought the certificates would be not only marketable but "attractive."

It is expected that negotiations with the companies will be resumed and if an agreement on other features of the plan is reached a court test will be made of the certificates. The opinion of the bankers stirred up considerable discussion because the faction led by Mayor Thompson has been contending that nothing can be done without legislation and that the only solution lies in the formation of a "local transportation district" with authority to impose and collect taxes for purchase of the properties.

Meanwhile the committee of engineers is working on plans for a subway system. It has been decided that this matter would have to be submitted to a referendum next June. The details of routes, etc., will be worked out during the next six months.

Pacific Railway Club Elects Officers

At the annual meeting of the Pacific Railway Club held in San Francisco, Cal., on March 11, the following officers were elected for a period of one year: President, F. S. Foote, professor of railway engineering, University of California; vice-presidents, J. N. Clark, chief of the Fuel Bureau of the Southern Pacific Railroad, and J. M. Yount, master mechanic of the Market Street Railway, San Francisco; treasurer, R. G. Harmon, chief clerk of the Western Pacific and Denver & Rio Grande road.

News Notes

Differences to Be Settled.—Conferences are taking place between representatives of the employees of the Scranton (Pa.) Railway and officials of the company over the matter of wages. The men have demanded approximately a 10 per cent increase.

Electric Cars to Carry Mail.—The postoffice department appropriation bill reported to the United States Senate by its appropriations committee provides $700,000 for the inland transportation of mails by electric and cable cars.

Mr. Bemis Retained by Syracuse.—Announcement was made on March 11 by Mayor John H. Walrath and Frank J. Cregg, corporation counsel of Syracuse, N. Y., that Edward W. Bemis, Chicago, would be retained to aid the city in seeking to require the New York State Railways to reduce its fare from 8 cents and to discontinue use of one-man cars. The city will begin the presentation of evidence against the one-man car and for a reduction in fare on March 31 in Syracuse, the Public Service Commission having transferred trial of both cases from Albany to Syracuse in order to accommodate the city's witnesses.

Wants Wage Dispute Settled.—The London (Ont.) Street Railway employees' union has applied for a board of conciliation to settle a wage dispute under federal labor laws. The company enforced a wage reduction of 3 cents an hour on March 1. The men also formally lodged a protest with the department of labor against the action of the company, the claim being that the company should have itself applied for a conciliation board or awaited action by the men. The Ontario Railway and Municipal Board was previously asked by the men to restrain the company but that body ruled that it has no jurisdiction in wage disputes.

Mr. Beeler Retained in Richmond.—The members of the committee on streets of the Council of Richmond, Va., has recommended the retention of John A. Beeler, New York, as consultant in connection with its investigation of the local railway situation. The Council originally appropriated $10,000 for an investigation. It then asked for bids from engineers. When the matter came up for discussion before the committee on streets of the Council there were many replies to the appeal of the Council. After the matter had been discussed it was found that the scope of the investigation as planned originally was too narrow to secure what was really desired, and the whole matter was considered again. In consequence it was decided by the committee that the sum of $25,000 should be set aside to secure the study which is now deemed essential.

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Financial and Corporate

$9.19 a Share on Common

Public Service of New Jersey Presents Very Encouraging Report—President McCarter Optimistic

The annual report of the Public Service Corporation of New Jersey and subsidiary companies shows net income, after charges and taxes, amounting to $3,594,629. This is equivalent, after deduction of preferred dividends, to $9.19 a share earned on the $30,000,000 common stock, and compares with net income of $2,218,408, or $5.12 a share, earned in 1920. Details of the report are shown in the following table:

	1921	1920
Operating revenue	$75,311,507	$72,318,087
Other income	2,097,315	2,378,407
Total income	$77,408,822	$74,696,494
Operating expenses	51,769,627	52,638,939
Amortization charges	4,893,956	3,237,529
Net after taxes	$20,745,237	$18,820,026
Subsidiary companies' fixed charges	12,856,151	12,324,889
P. S. Corporation's fixed charges	4,294,458	4,276,729
Net income	$3,594,628	$2,218,408
*Preferred dividends	835,739	681,757
Common dividends	1,200,000	1,199,984
Balances	$1,558,890	$336,667
Miscellaneous debit	107,986	†18,658
Surplus	$1,450,904	$355,325

*Exclusive of that owned by Public Service Electric Company. †Credit.

In his remarks to the stockholders Thomas N. McCarter, president, says:

The company came through the year in a very satisfactory condition. Special attention is called to the amount of $4,893,956, which is plowed back into the properties of the company through the amount set up for amortization charges. In addition thereto, a very considerable amount was carried to profit and loss account, over and above the sum disbursed for dividends.

The future is full of promise. If the company is allowed to proceed in its great work of developing the State along the lines of its activities, without undue interference occasioned either by political agitation or unfair and ill-advised regulations, it believes it can perform a most useful service to the people of the State and yield to its security holders a reasonable return upon their existing and future investments.

Mr. McCarter says that the basic problem of wasteful jitney competition still remains unsettled in New Jersey, although nearly everywhere else it has been solved at least to the extent of the removal of useless competitive service upon the same streets. Although the financial condition of the railway company is already much improved and this improvement is expected to continue, it cannot function at its highest efficiency at a minimum fare so long as this destructive competition remains.

The plan put into effect during the year for selling the preferred stock to customers on the installment plan has been favorably received. The company intends to continue this method of distributing its securities. There has been sold at par an issue, chiefly in this way, of $1,666,600 of 8 per cent cumulative preferred stock. In addition $1,198,600 of the issue has been sold on the instalment plan and partially paid for.

The directors of the corporation on March 21 increased the annual dividend rate from $4 to $6 by the declaration of a quarterly dividend of 1½ per cent on the common stock, payable March 31 to stock of record March 29. The $4 rate has been paid since March, 1920.

Philadelphia Directors Organize

The present agreement of the Philadelphia (Pa.) Rapid Transit Company with Thomas E. Mitten has been renewed with compensation unchanged. He was also elected president and chairman of the board.

The by-laws of the company remain unchanged and an executive committee of five members has been elected by the board, with T. E. Mitten as chairman, the other members being W. C. Dunbar, who is also vice-president of finance and accounting; G. A. Richardson, also vice-president in charge of operation; H. G. Tulley, who represents Mitten Management in co-operative welfare matters, and C. J. Joyce, counselor.

The other officers elected by the board were E. L. Austin, comptroller; G. W. Davis, treasurer; F. B. Ellis, secretary, and W. D. Witt, auditor.

Brooklyn Outlook Bright

Protesting Figures in Commission Valuation Committee of Stockholders Sees End of Receivership

The protective committee of stockholders of the Brooklyn Rapid Transit Company made public on March 19 a letter to George McAneny, chairman of the New York Transit Commission, protesting against the valuation set upon the properties of that company and its subsidiaries by the commission.

The committee in this letter questions the authority of the commission to set a valuation of only $154,000,000 on property in which it is said that $238,000,000 had been invested, as the first step in its plan for a unified transit system, and charged the commission virtually with attempting to confiscate property by wiping out all equities.

The committee said that the city had flagrantly and deliberately violated its contract with the Brooklyn Rapid Transit Company, particularly by delay in the construction of the Fourteenth Street-East New York line, and served notice on the commission that it proposed to request Receiver Lindley M. Garrison to take immediate legal steps to recover at least $20,000,000 for the city's alleged defaults under the contract.

The letter says at the outset:

When your commission promulgated the general outlines of its proposed plan of readjustment last fall, and this committee was invited to express its views on some of the underlying principles, we gladly complied, and assured you of our co-operation. We endeavored, however, to impress upon you that any such plan as you were then contemplating, to be successful, must be predicated upon valuations which would be fair to all classes of security holders.

Your engineers state that they have endeavored to ascertain actual or original cost, and that, where this has not been ascertainable, they have "estimated" the same on various theoretical assumptions as to conditions under which the properties should have been constructed. Apparently, however, no real effort has been made to check the actual investment, especially with respect to the older properties.

In this manner an unfair impression has been given the public, and both your commission and the public may be grossly deceived thereby. We are advised by those who are familiar with the history and development of the properties that the actual investment exceeds $238,000,000, the principal items of which are readily ascertainable and easily verified. This aggregate (including Brooklyn City Railroad for comparative purposes), we are advised, is made up of approximate amounts as follows:

1. Capital debt outstanding, consisting of bonds, notes, receiver's certificates and real estate mortgages, but excluding stocks	$140,000,000
2. Cash paid in by stockholders of Long Island Traction Company (predecessor of B. R. T.)	4,500,000
3. Cash expended by B. R. T. Company and represented by bonds, converted into B. R. T. stock, par for par	29,600,000
4. Cash realized from the sale of B. R. T. stock	4,600,000
5. Cash expended out of income and other sources for construction and equipment and not represented by any capital securities in the hands of the public, but mostly in unsold treasury bonds	23,600,000
6. Cash appropriated from earnings for additions and improvements against which no securities have been issued	5,000,000
7. Cash used to retire or withdraw bonds against which there are no securities outstanding in the hands of the public	3,000,000
8. Cash paid in for Brooklyn City Railroad stock	12,000,000
9. Cash and equivalents put into Brooklyn Union Elevated Railroad, Kings County Elevated Railroad, and Nassau Electric Railroad, prior to acquisition, less bonds outstanding at that time, this equity being now represented in stocks, at least	15,700,000
Total	$238,000,000

It is explained by the committee that the total of $238,000,000 does not include any value for franchises, nor does it include a large amount chargeable for interest during construction, appreciation of real estate over original cost and other items which would very substantially increase the above amount. The committee then explains that as opposed to this actual investment, which is $10,000,000 in excess of the net capitalization of the B. R. T. system outstanding in the hands of the public Dec. 31, 1921, the engineers of the commission propose to allow, on the basis of their theoretical assumptions as to "actual" or "original" cost, only $154,000,000, or a difference of $84,000,000. The committee says that this recommendation is obviously so unfair as to afford no basis for discussion.

In continuing its comment the committee says:

In view of the conclusion which we have reached and already expressed, we do not propose to consider separately the valuations placed upon the properties of the subsidiary companies included in the foregoing aggregate. We cannot, however, refrain from emphasizing the very great in-

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justice which the proposed valuations do the rapid transit properties of the company, for the extension and equipment of which, in conjunction with the new city-built subway lines, approximately $78,000,000 has been obtained from investors and expended since 1913.

The outstanding debt against these properties, including the underlying bonds, notes and bonds issued since 1913, with interest in default, receiver's certificates, tort claims and other obligations, is estimated at more than $135,000,000, approximately $78,000,000 of which has been expended since 1913 under the direct supervision and control of your commission or your predecessors in authority. To provide for this debt of more than $135,000,000 your engineers recommend a valuation of approximately $96,000,000, or $39,000,000 less than enough to provide for the debt, thus eliminating completely all stockholders' equities in the properties.

In reaching this valuation your engineers have placed a net value of approximately $22,400,000 on the company's extensive elevated railroad system in the Borough of Brooklyn, which was given an earning power under the contract with the city of $3,500,000 per annum, which, capitalized at 5 per cent (the rate proposed under your plan), would support a value of at least $70,000,000 for the property.

In conclusion the committee calls attention to the fact that the earning power of these properties has shown marked improvement during the current fiscal year. Conditions are beginning to return to normal. The average operating ratio (including taxes) of the surface lines has been reduced from 97.15 per cent in 1921 to about 78 per cent for the first seven months of the current year, and the operating ratio (including taxes) of the rapid transit lines included in the system has similarly been reduced from 94.43 per cent to about 75 per cent.

At present the B. R. T. system as a whole is earning full interest on its funded debt, and the committee says that it is advised that there is a possibility of further improvement in the future. It is certain, according to the committee that as soon as the new lines which the city has not yet finished can be placed in operation the net revenues of the rapid transit system will be increased by a substantial amount, estimated at not less than $1,000,000 per annum. It may, therefore, be predicted, says the committee, that at a not distant date, with the co-operation of the security holders, it will be possible to take the properties out of receivership and permit them, with credit restored, to render a still greater public service

$727,914 Profit in Winnipeg

Despite Adverse Economic Conditions Winnipeg Electric Railway Again Makes Encouraging Progress

At the annual general meeting of the shareholders of the Winnipeg (Man.) Electric Railway on March 10, the report of the president and directors and the fianancial statements for the year ended Dec. 31, 1921, were presented and adopted. The report of the operations for the year ended Dec. 31, 1921, follows:

Gross earnings from operations	$5,418,023
Operating expenses, before charging depreciation	3,559,380
Net operating revenue	$1,858,643
Miscellaneous income	161,406
Income available to meet fixed charges, etc.	$2,020,050

From which the following deductions are made:

Interest charges on debenture stocks, bonds, gold notes, etc.	$633,331
Extinguishment of discount on securities	52,526
City percentage and car license taxes	183,069
Taxes	164,315
Miscellaneous non-operating expenses	3,312
Other income deductions	54,532
	$1,091,085
Net income as shown on accounts submitted herewith, excluding depreciation	$928,964

The gross earnings for the year 1921 show an increase of $184,323 over the previous year, and the net income shows an increase for the year of $132,389.

The company has continued making extensive improvements, particularly in the rehabilitation of rolling stock, track and roadbed. Substantial extensions were also required to take care of the expansion of the electric utility business and there were also improvements at the gas works.

After payment of all fixed charges and making the usual provision for depreciation the company made a net profit of $727,914. From this amount has been deducted the dividends paid on preferred stock amounting to $182,367 and also an additional allowance for depreciation amounting to $122,605, leaving $422,941 to be transferred to surplus.

The preferred stock recently authorized has all been marketed and the proceeds have been used to retire floating liabilities. President Nanton said:

> The company has continued its policy of maintaining good relations with the public and has given wide publicity to the problems confronting it so that all patrons may be acquainted with the conditions surrounding the operation of the properties. Emphasis has been stressed on the company's desire to provide courteous and efficient service and the public appears to appreciate the sincere efforts on the part of the company to bring this about.

Washington Merger Bill Reappears

Senator Ball of Delaware, chairman of the Senate Committee on the District of Columbia, has reported a bill previously introduced by him, authorizing the merger of certain street railways in the District of Columbia. In his report on the measure Senator Ball says that if the bill is enacted the railway situation in Washington will be greatly improved and simplified by operation of all the lines by one company. He points out that under the new system there will be no charges for inter-company transfers and that re-routing will be possible to the benefit of the car-riding public. Another advantage will be a saving in the operation of railways and a reduction in the coal bills, in addition to saving in overhead charges. Summarizing the benefits he says they will embrace "better service and lower fares."

Engineer Commissioner Keller of the District of Columbia Public Utilities Commission, in a letter to the Senator, recommends that there be not attached to the bill he has reported, which provides for taxing the surplus revenues of the car companies, a mandatory provision for a merger of the two lines.

Failing to secure authorization of the Utilities Commission to sell three tokens for 20 cents for both lines, the Citizens Association Federation has requested the commission to authorize this rate of fare on the Capital Traction Lines, on the ground that the company is now selling tickets fifteen for $1.

Conspectus of Indexes for March, 1922

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	March 1922 **7.14**	Feb. 1922 **7.16**	March 1921 **7.21**	May 1921 **7.24**	**4.84**
Street Railway Materials*	Feb. 1922 **156**	Jan. 1922 **157**	Feb. 1921 **191**	Sept. 1920 **247**	**100**
Street Railway Wages*	March 1922 **214**	Feb. 1922 **214**	March 1921 **231**	Sept. 1920 **232**	**100**
Steel Unfilled orders (Million tons)	eb. 28 1922 **4.14**	Jan. 31 1922 **4.24**	Feb. 28 1921 **6.93**	Apr. 30 1917 **12.18**	**5.91**
U.S. Bank Clearings Outside N. Y. City (Billions)	Feb. 1922 **10.16**	Jan. 1922 **11.58**	Feb. 1921 **10.43**	March 1920 **18.54**	Av. Mo. 1913 **6.12**
Business Failures Number	Feb. 1922 **2,090**	Jan. 1922 **2,705**	Feb. 1921 **1,435**	Jan. 1922 **2,705**	Av. Mo. 1913 **1,213**
Liabilities (millions)	**68.64**	**115.3**	**79.12**	**115.3**	**24.64**

	Latest	Month Ago	Year Ago	Peak	1913
U.S. Bur. Lab. Stat. Wholesale Commodities	Feb. 1922 **151**	Jan. 1922 **148**	Feb. 1921 **167**	May 1920 **272**	**100**
Bradstreet's Wholesale Commodities	March 1 1922 **11.60**	Feb. 1 1922 **11.42**	March 1 1921 **11.87**	Feb. 1 1920 **20.87**	**9.21**
Dun's Wholesale Commodities	March 1 1922 **169.7**	Feb. 1 1922 **165.0**	March 1 1921 **181.9**	May 1 1920 **263.3**	**120.9**
Annalist Wholesale food	Mar. 18 1922 **182.6**	Feb. 18 1922 **173.2**	Mar. 19 1921 **193.6**	June 12 1920 **329.2**	**140**
U.S. Bur. Lab. Stat. Retail food	Feb. 1922 **142**	Jan. 1922 **142**	Feb. 1921 **158**	June 1920 **219**	**100**
Nat. Ind. Conf. Bd. Cost of living	eb. 1 1922 **157.7**	Jan. 1 1922 **161.4**	Feb. 1 1921 **176.3**	July 1 1920 **204.5**	(1914) **100**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over, except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on street and interurban railways in the United States.

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Valuations All Protested in New York

Tentative Figures Presented by New York Transit Commission as Basis for Negotiations in Pooling Arrangement Are Regarded as Ridiculously Low by Companies

The Interborough Rapid Transit Company, the Brooklyn Rapid Transit Company, the Manhattan Elevated Railway and the Third Avenue Railway notified the Transit Commission on March 20 that the valuations recommended by commission experts are too low to provide a basis for the inclusion of these roads in the citywide reorganization plan offered by the commission.

DISCLOSURE of the attitude of the companies took place at a hearing of the commission at which the forty companies involved in the reorganization project were requested to submit criticism of the valuations.

The total valuation of the forty companies was placed by the commission appraisers at $465,680,154. This sum covered privately owned properties only and did not include the city's expenditure of approximately $300,000,000 in subways. The figures were summarized in the ELECTRIC RAILWAY JOURNAL for Feb. 25, page 333.

The Interborough letter, requesting a redetermination of values by an "impartial board," said that the $174,221,056 estimate by the commission appraisers fell far short of a proper allowance. Instead, the communication held, the present worth of the I. R. T. properties is at least $300,000,000, while the commission appraisal "would not be sufficient to pay par on the outstanding bonds and notes, thus leaving nothing whatever for the stock."

In revising the I. R. T. valuations, at least in some particulars, the road seeks to have another board set the figure, pointing out that the commission should not do this. as "it is not consistent with fairness to permit a party to be the judge of its own case."

The communication from a committee of holders of Interborough-Metropolitan collateral trust bonds announced its disapproval of the valuations because they left nothing for I. R. T. stock, which is the security for the bonds in question.

In opening the hearing on March 20 Chairman McAneny pointed out that the proposed valuations are subject to revision if the commission comes to the belief that changes should be made.

The position of the bondholders of the Brooklyn Rapid Transit Company against the valuations was brought out in a communication presented by Paul D. Cravath. The contention on behalf of this company is referred to elsewhere in this issue. There was also a letter from Lindley M. Garrison, receiver for the Brooklyn system, in which he did not give his views for the reason that the receiver, only a temporary official, has no authority in the premises. In refraining from submitting criticism of the valuations Mr. Garrison said he felt this was his proper course, "however well founded the same might be."

The Third Avenue Railway submitted its answer in a letter signed by President S. W. Huff, who characterized the valuation of its system as "absurdly low." The Third Avenue valuation by the commission experts was just under $34,000,000, which, according to Mr. Huff's letter, is about half what it should be.

The attitude of the Manhattan Elevated Railway the lines of which are operated by the Interborough under a 999 year lease at a yearly rental of millions of dollars, was disclosed in a letter from President Alfred Skitt, who said the security holders would not accept the proposed appraisal of only $57,374,205 as against a company book value of more than $113,000,000.

The communication from Mr. Skitt characterized the Manhattan valuation as "grossly inadequate" and said that an attempt to take the property at that figure would amount to confiscation in violation of the rights of security owners. Terming the proposal of the commission to give quasi public bonds in exchange for the road "unsatisfactory," the Manhattan official said his company would require cash or its equivalent as compensation if the lines of that company were included under the unification plan which the commission has advanced.

Job Hedges, receiver for the New York Railways, the Interborough's surface subsidiary in Manhattan borough, sent a letter in which he said he had no authority in the valuations matter and, therefore, did not give his views. It was said that the problem was one for the security holders of the road to decide and a letter from them is expected to follow the lines indicated by the parent corporation.

In the course of its protest the Interborough Rapid Transit Company said:

> The law authorizes the commission to value the property at the "fair reconstruction cost of the property less depreciation." It is respectfully submitted that the fair reconstruction cost of the property contributed by this company to the development of the new subways and elevated improvements would be at the present time a sum equal to at least 115 per cent, of the net cost in money just as the contract contemplates, and that after making reasonable deductions for theoretical depreciation, if any, which is not conceded, and discount, the sum remaining would be in excess of the par of the outstanding bonds and notes issued by the company to aid the city in its rapid transit projects of 1913.
>
> To ask investors who within the past three years have bought $38,144,400 of the company notes, and within the five years prior to that bought $162,106,000 of bonds, to accept less than par and interest savors so much of repudiation by the city of New York that it is inconceivable that the commission will find itself able to adopt the valuations its bureau placed upon the property provided under the contracts of March 19, 1913.
>
> From the foregoing it appears that the present value of the property in question is at least $300,000,000 instead of $174,221,058 reported by your bureau of valuation. Other assets not appraised by your bureau, but which are represented by the capital stock of the company increase the present value of the entire assets of the company to a sum greatly in excess of $300,000,000. Yet your reported valuation would not be sufficient to pay par on the outstanding bonds and notes, thus leaving nothing whatever for the stock.

The letter from the Interborough-Metropolitan bondholders, signed by Grayson M. P. Murphy, chairman, said:

> We regret to find that none of the valuations of the properties of the Interborough and the Manhattan companies proposed by your valuation bureau would furnish a basis for the issue of sufficient securities to protect present holders.

Connected indirectly with the valuation and the fare matters in New York is the question of the attempt by the Interborough to secure changes in the terms of the lease under which the Manhattan Elevated Railway is operated by the Interborough. Seven per cent per annum is guaranteed by the I. R. T. on the stock of the Elevated, which has come to be regarded as a white elephant. Alfred Skitt, president of the Manhattan Railway, and George Welwood Murray, its counsel, as well as James L. Quackenbush, counsel of the Interborough, said a few days ago that there had been no new developments in the situation. It was learned that an almost daily interchange of views was being made between officials of the companies and the committee of security holders of the Manhattan Railway, of which Alvin W. Krech is chairman.

An authority who refused to permit his name to be used said:

> The Manhattan Railway is not the only obstacle, The Manhattan is willing to make concessions, but the other side must make concessions, too. The matter of scaling down the 7 per cent stock guarantee is not to be the only basis of change. The Interborough has made millions out of this lease and has found it to be profitable. If the situation demands change, the entire burden is not going to fall upon the Manhattan stockholders.

It was reported that the Interborough would like to have the 7 per cent reduced to 4½ or 5 per cent, but it was said that this would not be likely to be satisfactory to all the Manhattan stockholders. The records of the Transit Commission show that on June 30 last the following were among the larger stockholders:

Jay Gould estate, $8,130,100; H. J. Cammann, $2,289,000; General Education Board, $1,451,400; Bertrand Cutler, $1,144,000; University of Chicago, $1,100,000; J. M. Amory & Son, $1,000,000; Rockefeller Foundation, $990,000.

Tentative Agreement Reached

General Manager H. H. Couzens of the City of Toronto (Ont.) Transportation Commission has reached a tentative agreement with the union under which the prevailing rate of wages will be maintained for another year. The men's request for two weeks' holidays with pay was not given serious consideration. The wage schedule of the commission gives car men 55 cents an hour for the first six months, 57½ cents for the next three months and 60 cents an hour thereafter.

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Termination of Receivership in Sight

Early release of the receivership under which the Des Moines (Iowa) City Railway has been operating since 1919 was hinted at recently when Judge Martin J. Wade of the federal court signed an order at Ottumwa permitting the company to exercise its corporate powers to borrow money with which to pay its debts. The court order was in response to an offer by the company to assume and pay the debts incurred by the receivership and also to pay some of the long past due accounts of the company itself, if it were again placed in control of its own property and the receivership lifted.

The offer states that the company on the strength of the franchise granted Nov. 29, 1921, has arranged to pay its debts if it can now get its property under its own control. According to the offer it is proposed to liquidate approximately $1,000,000 at this time by means of long term notes. The company agrees in its offer to assume, as a part of the receivership expenses, the bill for the cost of the special franchise election and the advertising incident to it. It also announces that it has arranged with the holders of the debentures now outstanding to accept the company's promissory notes in lieu of claims for interest on the debentures, and that it has arranged for an extension of credit on the notes held by those creditors whose claims are most pressing. Among these claims is one of the Harris Trust & Savings Company for $258,182, one of the Western Water, Light & Traction Company for $332,497. A. W. Harris and others hold personally notes aggregating $161,951.

Judge Wade's order allows the Harris Trust & Savings Bank, the North American Railway Construction Company, the receivers and intervenors, including the city, until March 23 to file objections to his accepting the offer, and permits the company in the meantime to proceed with its arrangements for credits to fulfill its agreement.

Deferred Dividends All Paid

The last of the deferred dividends on the common stock of the Montreal (Que.) Tramway will be paid on March 28. The next regular dividend will be on May 1. Dickinson & Walbank, who specialize in the stock of the company, say:

> The repayment of 17½ per cent deferred dividends (deferred before the new franchise had demonstrated its present satisfactory characteristic) is, we believe, unique in Canadian stock market history. No doubt the thirty-odd years of uninterrupted dividend payments had a sentimental influence upon the broad policy of repayments adopted by the administration.
>
> In twenty-four months the company has paid in dividends an aggregate of 37½ per cent on the stock, or 18¾ per cent per annum. This achievement has two-fold significance. It demonstrates remarkable earning capabilities; and it indicates, better than words, the liberal dividend disposition of the board.
>
> With all the deferred dividends paid off, we now can look forward to the terms of the prospective new capital stock issue, which we anticipate will be on a basis to represent from $10 to $12 per share on the stock.
>
> Tramways stock is quoted at 146 to 147, at which price the 10 per cent dividend will yield 6.80 per cent per annum.
>
> For a full-year period from date, purchasers before the close on March 20, should receive an aggregate return approximating 15 per cent on the investment, and henceforth for thirty-one years, or more a return of at least 6.80 per cent per annum.

$247,132 Net in Honolulu

The Honolulu Rapid Transit & Land Company, Honolulu, Hawaii has reported gross earnings for 1921 amounting to $960,992 with operating expenses at $635,998 against $580,028 in 1920.

According to the manager this advance in expenses is due to higher wages paid and a greater number of car miles operated. The net earnings were $247,132, an increase of $48,264 over those of the previous year. The company carried 19,202,083 passengers during 1921 of which 4,215,819 were transfer passengers. The total passenger traffic shows an increase of 25 per cent over 1919 and an increase of 12½ per cent over 1920.

Holding Company Sells Stock

The United Light & Railways Company, with headquarters in Grand Rapids, Mich., between October, 1920, and October, 1921, sold more than $1,000,000 of its 7 per cent prior preferred stock to 3,733 subscribers or customers in the seventeen different communities served by its subsidiary companies. The company operates in Iowa, Illinois, Indiana, Michigan and Tennessee. The stock was first offered on Oct. 1, 1920, to employees of the company. The response was very gratifying. Employees of three operating companies subscribed 100 per cent, six showed percentages ranging from 91½ to 99.2, and one electric railway took 82 per cent. The stock was then offered to the public through employees of the company for cash at par or on the installment plan with a payment down of $10 and installments of $7.50 per month, plus interest on the unpaid balance.

Schools of instructions were conducted for the employees to familiarize them with stock selling methods. After the team organization had been maintained for about three months, it was decided to organize a separate department of the company to be known as the securities department. Prizes were offered for the best records.

The plan followed was to take a list of the lighting and power customers in the city concerned and to have a committee of employees having the broadest acquaintance among the customers eliminate names of those who probably would not be interested. Then the others were seen personally. The company agrees to take back stock for resale, but does not guarantee to sell it at par. The salesmen were instructed to sell stock only to those who expected to be able to keep it as a permanent investment. In connection with the sale a newspaper advertising campaign was conducted.

Court Approves Bond Payment by Receivers

Receivers Fagan, George and Tone of the Pittsburgh Railways have been directed on petition of President Thompson of the Philadelphia Company, holding company of the traction concern, by the United States district court to file a report on the receivership not later than April 1. This is the first legal step toward reorganization of the railway in accordance with the contract between the city of Pittsburgh and the Philadelphia Company.

The court at the same time, taking up two other angles of the situation, confirmed absolutely the 1921 accounting of their stewardship of the Pittsburgh Railways filed by the receivers, and approved the settlement, at more than $1,000,000, which former Judge Henry G. Wasson, as master, recommended the receivers should make with the Southern Traction and United Traction companies, two of the three big underlying companies of the Pittsburgh Railways for bond and mortgage interest payments, these questions had been in litigation several years.

The Southern Traction and United Traction settlements, as recommended by former Judge Wasson, as master, proposed to pay the trustees of mortgages held on the lines of the Southern Traction Company, the West End lines, $700,000 in interest, less $100,000 already paid on account; $75,000 to the Union Trust Company, trustee under these mortgages, for service and expenses, and to the holders of bonds of the United Traction Company, $480,400, as interest. The total payments recommended, and approved by the court, are $1,155,400.

This settlement disposes of a threat, in the case of the Southern Traction Company, to foreclose on its mortgages on the properties, take the West End lines out of the Pittsburgh Railways system and operate them separately.

Utah Property Lists Assessment Charges

The Salt Lake & Utah Railroad, Salt Lake City, Utah, has made its report for assessment purposes to the Utah state board of equalization, showing a total this year of $2,087,591. Last year the company paid taxes on a valuation as finally fixed by the state board of $2,397,905. The state board will revise and probably amend the figures presented this year. The main reduction in values claimed by the company is in that given to trackage and right-of-way, which the company says is worth this year $1,520,700, of which $868,980 is in Utah County and the remainder in Salt Lake County. Last year the company paid taxes on $1,837,710 under this heading, $1,034,300 being in Utah County. The company enters a value of $100,000 for its franchise, but explains that it is not claiming this amount, and has doubts as to its legality, but is willing to let the figure of last year stand.

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Bondholders Promise to Rehabilitate

No bids were received by Receiver George Whysall on March 18, when the properties of the Springfield, Troy & Piqua Traction Company were put up for sale the second time at the courthouse in Sprinfield, Ohio. As a result, announcement was made by Judge Merle N. A. Walker, Indianapolis, and G. L. V. Emerson, Chicago, representing the bondholders, that the bondholders will proceed at once to carry out the original agreement with the court to take steps to rehabilitate the properties. The line which runs between Springfield and Troy, has not been in operation for several months, except for a shuttle car operated between Springfield and Maitland, a distance of 2 miles, for the benefit of employees of the Victor Rubber Company. With the announcement of the bondholders, however, it is expected that service will be resumed within the near future.

Judge Walker announced that definite action would be taken within the next thirty days. Judge Walker, who is a brother of Guy M. Walker, New York City, trustee for the bondholders, said that he had been called into the case recently and that after a thorough investigation he found citizens of Springfield and other communities on the line were doing their part in the attempt to save the road. These citizens raised a fund of $75,000 in return for which they were to receive bonds to that amount. However, after this fund had been raised, no action could be secured on the part of the bondholders and so the first sale of the road to the bondholders for $300,000 was set aside by the court and the property ordered to be again offered at public auction March 18.

The upset price for the property was fixed by Judge John E. Sater of federal district court at $135,000. The receiver was ordered by the court not to consider any bid under that figure and also to require a cash payment of $25,000; one half of the remainder in thirty days and the other half in sixty days.

Reorganization Being Planned

Plans for the reorganization of the Syracuse & Suburban Railroad, Syracuse, N. Y., recently purchased by a committee representing the bondholders is soon to be laid before the Public Service Commission for approval. The financial end of the reorganization provides for the issuance of $750,000 of income bonds. The new company will also issue $300,000 in common stock. The new corporation will be known as the Syracuse & Eastern. The outstanding bonded indebtedness of the old company was $550,000.

It is expected that a new manager will be appointed for the road as C. Loomis Allen, former vice-president and general manager. is now president of the L. R. Roberts Typewriter Company, Stamford, Conn.

Financial News Notes

Noteholders Depositing Their Securities.—The holders of 90 per cent of the three-year gold notes of the American Railways, Philadelphia, Pa., due on Feb. 1 last, have deposited their notes for extension of three years.

H. C. Beatty a Director.—Harold C. Beatty has been appointed a director of the Syracuse-Northern Railway, Syracuse, N. Y., succeeding Ernest I. Edgecomb, who resigned upon election to the bench of the Supreme Court.

Common Stock Dividend Passed.—The Porto Rico Railways, Ltd., San Juan, Porto Rico, which controls the Porto Rico Railway, Light & Power Company, has passed the dividend on the common stock, due at this time. The rate during 1921 was 1 per cent quarterly.

Loan Secured.—The Eighth Avenue Railroad, New York, N. Y., has secured a new mortgage loan of $800,000 from the Farmers Loan & Trust Company. The proceeds will be used for improving the block front on the west side of Eighth Avenue between Forty-Ninth and Fiftieth Streets and for other corporate purposes.

Interurban Sold to Representatives of Bondholders. — R. M. Stinson and Thomas Conway, Jr., of Philadelphia, representing eastern bondholders, have purchased the Aurora, Elgin & Chicago Railway at foreclosure sale in Wheaton, Ill. on a bid of $1,000,000 above their holdings, which consist of $4,735,000 refunding mortgage bonds.

Application for Lease Before Commission.—The application by the Easton Transit Company and the Lehigh Valley Transit Company, operating in Allentown, Easton and Bethlehem, for the approval of a lease of all the property and franchises of the former corporation by the latter, is being considered by the Public Service Commission. The lease is for ninety-nine years, and stipulates the lessee must carry out all the obligations of the lessor.

Bondholders Organize to Protect Valuation. — A committee has been formed to represent bondholders of the Columbus & Ninth Avenue Railroad, New York, N. Y., and it is urged that holders of the bonds deposit them with the Columbia Trust Company before April 1, on or about which date hearings of the Transit Commission regarding the valuation of this and other traction properties is to take place. The committee states that in its opinion the valuation prepared by the Transit Commission is too low.

Sale Approved.—The sale of the defunct Sandusky, Norwalk & Mansfield Electric Railway, Norwalk, Ohio, to the Wilkoff Company, First National Bank Building, Pittsburgh, Pa., has been approved by Judge J. M. Killets of Toledo. The approval is conditional on protests that may be filed within ten days. A certified check of $10,000 was deposited by the Wilkoff group, recently, with G. Ray Craig, Norwalk, master commissioner of the railway. The price of the property fixed by the federal court is $60,000.

North American Company Dividend Policy Announced.—In order to clear up any uncertainty respecting the dividend declared on Feb. 28, the North American Company, New York, N. Y., has issued the following statement: "The dividend was a quarterly dividend of 2½ per cent payable April 1, of which 1½ per cent is payable in cash and 1 per cent in preferred stock. The 1 per cent payable in preferred stock was not an extra dividend and the company expects to maintain dividends on its common stock at the rate of at least 2½ per cent quarterly in the future."

Supplementary Opinion in Columbus Case.—In a supplementary opinion by Judge Kinkead of the Court of Common Pleas of Franklin County, Ohio, on the final entry and judgment in the Columbus Railway, Power & Light Company suit against the Clarks, judgment for the whole amount of $1,079,726 is rendered against C. M. Clark and E. W. Clark & Company, jointly and severally. Secondary liability has not been found against other members of the board. The items included in the judgment were reviewed in the account of the decision of the court which appeared in the ELECTRIC RAILWAY JOURNAL of Jan. 28, page 168.

Sale of Lafayette Property Approved.—Judge A. B. Anderson in the federal court at Indianapolis has approved the sale of the Lafayette (Ind.) Service Company's property which was held at Lafayette as the result of foreclosure proceedings brought by the Real Estate Trust Company, Philadelphia, as trustee on behalf of bond holders. The court set March 31 as the date on which the transfer of the property should be made to the purchasers. R. W. Levering, of Lafayette, has been acting as receiver of the company. The details of the sale were recorded in the ELECTRIC RAILWAY JOURNAL of March 11, page 423.

$30,000,000 in Bonds of French Company.—Kuhn, Loeb & Company are offering $30,000,000 of a $40,000,000 issue of 6 per cent external sinking fund gold bonds of the Paris-Lyons-Mediterranean Railroad. They are offered at 83, to yield 7.35 per cent to the date of maturity, which is Aug. 15, 1958. The entire issue may not be redeemed before Feb. 15, 1932, and if called then the yield gradually increases to a maximum of 8.78 per cent. If any bonds are redeemed by the sinking fund at 100 on Aug. 15, 1929, the yield reaches a maximum of 9.22 per cent. The proceeds are to be used for purchasing rolling stock, for electrification of several lines and for other improvements.

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Traffic and Transportation

Connecticut Fares Again Problem

Commission Seeking to Determine What Shall Be Done Following Close of Five-Cent Trial Period

Hearings are being held by the Public Utilities Commission of Connecticut in various parts of the State to inquire into the fare situation on the lines of the Connecticut Company. It will be recalled that tests with a radial 5-cent fare are in progress in Bridgeport and Norwalk for trial periods under the commission's rulings. It is with the end in mind of determining what shall be done in the future that the commission met in Norwalk on March 21 and in Bridgeport on March 22.

At the hearing in Bridgeport Mayor Fred Atwater and members of the Mayor's transportation committee asked that the present radial 5-cent fare be continued, with the benefits of a reduction through the token system to be allowed for riders in communities on the outskirts of Bridgeport.

Judge Carl Foster appearing for the Manufacturers' Association, Chamber of Commerce, Business Men's Association and various organizations in Bridgeport, Fairfield, Stratfield and Stratford, asked for a unit 5-cent fare within the limits that were established for the old 10-cent fare, with a 2-cent transfer.

President Lucius S. Storrs of the Connecticut Company briefly stated that the company was not "earning enough to function in civic growth and civic necessity," and claimed that a comparison of revenues under the 5-cent fare with revenues last year meant nothing because jitney competition had been reduced in the meantime. He said that "until the time comes when the transportation corporation can be delegated for the sole medium of transportation, the community must suffer through higher fares,"

The financial statement of the company for the period of the test fare, read into the record of the hearing by Chairman Higgins follows:

GROSS OPERATING REVENUE	
November	$52,911
December	166,475
January	164,906
February	146,396
Total	$530,688
OPERATING EXPENSES	
November	$55,139
December	165,084
January	146,666
February	130,849
Operating expenses	$497,738
Taxes	20,464
Total	$518,203
Net operating income	$12,485

For the period from Dec. 1, 1920, to March 1, 1921, the gross passenger revenue of the company on the Bridgeport lines amounted to $427,930 as compared with $463,881 for the period from Dec. 1, 1921, to March 1, 1922. During the former period the flat 10-cent fare was in effect and the trolleys were in competition with unregulated jitneys.

The representatives of the public in attendance at the meeting in Norwalk all pleaded for a continuation of the 5-cent fare on the expiremental 1-mile shuttle line and its extension to all of the local lines.

Chairman Higgins prefaced the hearing with a reading of the financial statement of the company for the Norwalk division from Nov. 6, when the 5-cent fare was put into effect on the West Avenue line, until Feb. 28. This statement follows:

GROSS OPERATING REVENUE	
November	$17,931
December	24,952
January	25,061
February	23,140
Total	$91,084
OPERATING EXPENSES	
November	$17,217
December	20,667
January	19,287
February	17,499
Total	$76,670
OPERATING INCOME	
November*	$370
December	2,888
January	4,912
February	4,836
Total	$12,266

*Deficit.

President Storrs declared that figures were not available for the new lines on which it was sought to make a test of the 5-cent fare, but he declared that he doubted if it would be a success because most of the lines were in sections thinly populated and there would not be the possibility of increasing the revenue through very material increases in traffic.

Special Car Charges Increased

The Pennsylvania Public Service Commission has received a new schedule of passenger tariffs effective April 15, 1922, from the Scranton, Montrose and Binghamton Traction Company, operating between Scranton and Montrose. In the schedule filed the special car charges increased are as follows:

One-way extra car attached to regular increased from 80 cents to $1.00 per car mile. Minimum charge from $12 to $20 Round trip extra minimum $12 to $25.

One-way special car from 80 cents a car mile to $1.50 a car mile for all distances in excess of 10 miles. Minimum charge increased from $15 to $25. *Round trip* special car is increased to $1.00 car mile with minimum charge at $30.00.

Minimum charge for running cars beyond scheduled destination is increased from $5 to $10 and the rate is changed from $5.00 per hour to 80 cents per mile.

Washington Fare Troubles Again

Associations Demand a Twenty-Cent Rate for Three Tickets as Well as Forty-Cent Rate for Six

Although the Public Utilities Commission of the District of Columbia established a new rate of fare in the National Capital effective on March 1, there is continued agitation over the fare question. This is due to the demand of various citizens' associations that the public be allowed to purchase three tokens for 20 cents, contending that some persons are unable to purchase six for 40 cents, and have to pay the 8-cent cash fare. The Citizens' Association Federation petitioned the commission to establish this 20-cent rate, but it has been held in abeyance by the commission to see how the present fares operate on the company's revenue. The Washington Railway & Electric Company opposed the three for 20 plan on the ground that it would reduce its revenues this year by $100,000. It suggested in lieu of all present fares a straight fare of 7-cents cash.

Because of the disparity in revenues of the two companies operating in Washington, the Washington, Railway & Electric making less than the Capital Traction Company, Congressional committees on District affairs are considering a tax proposal to equalize the revenues of the companies by imposing a graduated tax on their revenues. The matter was the subject of a hearing Monday before the Senate District Committee, at the request of the Capital Traction Company whose revenues would be more largely affected. A bill for merging the companies has again been introduced, as noted elsewhere in this issue.

Prepare for One-Man Cars

While citizens of Joliet, Ill., were storming against the installation of one-man cars by the Chicago & Joliet Electric Railway, city officials practically agreed that it would be impossible, except by expensive litigation, to force the company to keep to two-men service. At the same time, employees signed an agreement accepting the new type of car and providing an increase in pay of 5 cents an hour for operators.

The following wage scale will be made effective according to the agreement:

	Cents an Hour
City lines	55
Lockport and Lyons	57
EXTRA MEN	
First three months	51
First nine months	53
One year	55

The agreement also states that the employees who operate one-man cars will be paid for 15 minutes time in which to get their cars ready.

Petitions have been circulated requesting the City Council to re-enact the two-man car ordinance.

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Service Withdrawn in Augusta

Failure of the City Council to Regulate Unfair Jitney Competition Prompts Local Railways to Withdraw All Cars from Service

Electric railway service was suspended in Augusta, Ga., on March 16. It was still suspended on March 24. More than likely the cars of the Augusta-Aiken Railway & Electric Corporation will remain in the carhouses for some time to come, for on the evening of March 21 the Council of Augusta, ignoring the demands of all the constructive forces in the city, decided by a vote of thirteen to six to stick to its action of March 6 in refusing to grant relief as requested by the railway from the unfair, unregulated jitney competition.

AFTER the meeting of the Council on March 21 the company had nothing to say. There really was no statement for it to make. The officers had previously outlined their position at considerable length, and as long as the Council remains obdurate and refuses to heed the plea of the company it must of necessity stick to the course upon which it has entered.

Negotiations Begun Last Fall

Negotiations looking toward a settlement of the matter started last fall. According to the Mayor, the Council will so regulate the jitney traffic as to prevent congestion on any street occupied by the railway and will agree not to permit any jitney to take or discharge passengers on any street occupied by the railway if the railway will reduce its fares to 7 cents and continue to transport school teachers and school children at 5 cents and maintain a fifteen-minute headway on all city lines.

The Mayor feels that the offer of relief proffered by the Council in its resolution of March 6 is as far as that body can go.

This does not satisfy the company. Its position is plain. It is not antagonistic to a jitney service or to jitneys. It has stated publicly that a jitney line properly regulated as a public utility on streets not already occupied by trolley lines and one or two blocks removed therefrom would confer upon the public a new and real transportation service. Then each line would serve the riding public without very material interference with the other within the zone of its own operation, and the public would have two efficient and properly regulated public carriers.

For more than three months the company, backed up by the leading citizens of Augusta and by every civic body in the city, has been appealing to the City Council to recede from what the railway submits is a suicidal policy, taken in heat, and now seen to be fatal to the public service of the electric railway company.

Company Adopts Conciliatory Attitude

In a final effort to induce Council to keep the jitneys off the streets occupied by the car lines and forbid them to take on or discharge passengers within two blocks of the company's lines, the company agreed, if Council would do this, to concede a 7-cent fare to the general public, a 5-cent fare to school children and teachers, and require a 10-cent fare to the casual rider only, who fails or refuses to buy tokens at 7 cents in multiples of five or more.

This proposition was agreed upon between the company and the sub-committee of the general jitney committee of Council, and was reduced to writing in the shape of a letter addressed by the general manager to the sub-committee.

The sub-committee presented this letter to the general committee with the recommendation that the proposed agreement contained therein be reported to Council for adoption. But the general committee declined to do so and instead adopted a report that Council require as a condition precedent to any regulation of the jitneys a 7-cent straight fare for the general public, including the casual rider, and a 5-cent fare for school children and teachers, the city to "keep the jitneys off the streets now occupied by the street railway lines, with permission to cross intersections at which points they are not to take on or discharge passengers."

The jitneys committee made its report to the City Council March 6, 1922, setting forth its recommendation, as above outlined.

Thereupon the City Council passed a resolution adopting the report of the general committee as its final action, discharged the committee, and ordered the company be given one week within which to accept the city's proposition. While under this proposal the jitneys would not be permitted to take on or discharge passengers on streets occupied by the railway, or at the precise point of intersection of streets cross the same, they would be permitted to take on and discharge passengers anywhere else on all cross streets, even though it be within a few feet of the intersecting streets. The contention of the railway was that this practically defeated the very purpose of any regulation. Anxious to reach an agreement with the Council, however, the company finally signified that if Council would pass the resolution at once, the company would try to operate with the jitneys removed only one block from its lines.

In the meantime, however, the Council as noted previously had passed a resolution adopting the report of the general committee as its final action, had discharged the committee and ordered that the company be given one week in which to accept the city's proposition. The reply of the company to this notification received on March 8 was to the effect that "the company could not under the terms proposed earn even its operating expenses, and, therefore, must decline the city's proposition." At the expiration of the time limit set by the Council for acceptance of the proposal of that body the railway withdrew service as its answer to the ultimatum of the Council.

These briefly are the happenings which have shaped the course of recent events. They are all bound up, however, with the situation that developed as a result of the war. At first the Railroad Commission allowed the company a 6-cent fare, and then to avoid disaster, it allowed a 7-cent fare; and although by the actual trial, it was demonstrated that the company was in sore straits the commission, doubtless hoping for some improvement, refused a higher rate than 7 cents.

Thereupon, the company, alleging that the rate allowed by the commission was so low as to be confiscatory, applied to the United States courts to enjoin the commission from enforcing the rate which it had fixed and to allow the company to put in a higher rate. After a hearing in this high tribunal, at which the fact was disclosed that the receipts under a 7-cent fare failed to yield even operating expenses, the court authorized the company to put in a fare not exceeding 10 cents per ride. The company, however, adopted an 8-cent token fare for the general public, a 5-cent fare for school children and teachers and a 10-cent fare for the casual rider only, who might not desire to buy tokens.

It was hoped by the company and doubtless by the courts, that this increase would produce a revenue sufficient to enable the company to continue service without falling below the actual cost of operations, disregarding for the present, all consideration of any return upon the investment.

The city at once adopted measures that called into existence a competitive jitney service, and so encouraged and fostered it that between a third and a half of the revenue normally and legitimately flowing into the railroad has been taken away from it.

The bulk of the riding that is being done by the public in Augusta is on the jitneys, although private automobiles are helping out by giving lifts now and then. In an effort to alleviate the situation as far as possible, the Council has attempted to direct by ordinance the distribution of the existing jitney service.

The constructive elements in the community are of course in sympathy with the railway. They deplore the unfavorable attention which the withdrawal of service has attracted to the city of Augusta.

The suspension of service is particularly unfortunate for the employees, inasmuch as it has been impossible for the company to absorb any of the railway help into other departments.

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Fare Increase Denied I. R. T.

New York Rapid Transit Line Had Asked Commission for Temporary Rate Pending Settlement of Permanent Fare

The Interborough Rapid Transit Company, New York, has been denied an increase in fare. This action was taken by the New York Transit Commission following the signing of the Simpson-Jesse bill by Governor Miller on March 23. There was nothing else left for the commission to do under the circumstances, even if it had been kindly disposed toward the appeal of the railway for relief, for the new bill, which amends the transit act of 1921, forbids any increase of fare to any company which refuses to come into the proposed unified system under the Transit Commission's reorganization plan.

Another amendment to the transit act signed by the Governor gives the Transit Commission the right to order the operation of cars over lines of other companies. This is an emergency bill calculated to correct the situation which might arise should the Interborough Rapid Transit Company and the Manhattan Elevated Railway come to the parting of the ways over the matter of amending the lease between them, now considered by the I. R. T. to be unduly burdensome.

The Interborough Rapid Transit Company, through its counsel, George L. Quackenbush, has appealed to the Governor for a hearing on the bills. To this appeal the Governor replied:

I am surprised to learn of your action in filing a petition for an increased fare at the very time when you were asking me to withhold approval of a bill to prevent increases of fare fixed by contract, franchise and the like, except as a part of or as provided by the plan of reorganization. I do not share your fears either that the hands of the commission will be improperly tied or that any cloud will be put on the securities to be issued. I take it for granted that before the final consummation of any plan and the actual exchange of securities thereunder it will be necessary to secure a final adjudication of the validity of the plan. The act undoubtedly does tie the hands of the commission to the extent of preventing increases of fare to companies refusing to come in under the plan. That is precisely what was intended.

The application was for an "immediate, reasonable, temporary increase in the existing rates, fares and charges, pending a final determination." It was made to the Transit Commission at its hearing on March 22 by Frank Hedley, president and general manager of the Interborough Rapid Transit Company. The application said:

The Interborough Rapid Transit Company alleges that the maximum fare of 5 cents, now chargeable by it has been for more than three years, and now is, insufficient to yield reasonable compensation for the service rendered, and has been and is unjust and unreasonable.

The Interborough's fare application pointed out that final adoption of the commission's plan for the unification of the transit lines in New York will consume considerable time, and therefore requested the commission to fix a rate that will yield a reasonable average return on the property actually used by the Interborough. In addition to this request the Interborough asked for the immediate temporary increase.

To support this contention the application set forth that the Interborough's property was valued by the Transit Commission's own bureau on Jan. 30, 1921, at $228,515,261. The Interborough claims that its property is worth $300,000,000. After showing its return for the years 1918-21, the application alleged that a reasonable average rate of return on its property would be at least 8 per cent a year. Its present return and for the past four fiscal years, has been insufficient to procure a return of 8 per cent, the application said.

When the application had been presented, Clarence J. Shearn, counsel for the commission, advised the commission to reject it on the ground that it had no relation or relevancy to the present proceedings. George McAneny, chairman of the commission, said the commission would take notice that the application had been presented and have it filed with the secretary.

It was further alleged in the application that to provide

Safe, adequate, and efficient service, and for the preservation of its present system as an entity, the public interest requires an immediate, reasonable, temporary increase in the existing 5-cent rate of fare, now chargeable by the Interborough Rapid Transit Company, pending the final determination of the rate, as herein prayed for.

Such a reasonable, temporary increase would enable the Interborough Rapid Transit Company to avoid a receivership; to pay its fixed charges when the same became due; to restore its cash and credit position, and thereby permit it to make arrangements for the extension or refunding of certain of its securities and obligations which fall due in the near future. Such a reasonable temporary increase would also permit additional service to the traveling public and enable the Interborough Rapid Transit Company to provide additional equipment in rolling stock for its lines as and when the same are needed.

Who Should Assume Jurisdiction?

Seattle's bus problems again came before the State Supreme Court at Olympia recently, when Chief Justice E. N. Parker issued an original writ of mandate requiring Judge Walter M. French to appear before the Supreme Court on March 31 to show cause why he, as judge of the Superior Court of Kings County, should not assume jurisdiction in the matter of the application of the Seattle & Rainier Valley Railway, Seattle, Wash., for an injunction to prevent the further operation of automobile busses by H. E. Knowles, in competition with the railway's operations inside the city limits of Seattle. Judge French recently refused to assume jurisdiction in the case brought by the railway, which charges that Knowles, operating a stage line between Seattle and Renton under a certificate of public convenience and necessity from the department of public works, is operating only a few trips each day through to Renton, but is running cars on a schedule closely paralleling the railroad's operation between the downtown terminal and the Seattle city limits. Judge French held that this was a matter for the department of public works to handle.

Says Buses Financially Irresponsible

Electric railway service is superior to bus service, in the opinion of F. H. Wilson, receiver for the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, and remains superior even though it charges a higher rate. The receiver stated that buses are free from financial obligations to the state, while railways must pay specified amounts in taxes. The maximum amount charged a bus owner by the state is $72, according to the horsepower of the engine of his car. He need take out no indemnity bond and is not financially responsible in case of a civil action for damages, said Mr. Wilson.

On the other hand, Mr. Wilson pointed out, the bus operator uses the terminals maintained by the traction companies as a starting point for his route, and therefore wins passengers from the railway. Mr. Wilson denied that freight hauling by truck was less expensive than such service by railway. He stated that in the long run the citizens paid so much for the upkeep of the highways that it made the actual cost of shipment exceed that by electric railway.

Saginaw Forces Track Removal

By unanimous vote the City Council of Saginaw, Mich., on March 21 adopted an ouster ordinance directing the bankrupt Saginaw-Bay City Railway and its receiver to remove all trackage, overhead construction and other property from the city streets within ninety days. If the ordinance is not complied with, under its terms the city attorney is instructed to proceed in the United States District Court to secure permission for the city to do the work.

As stated in the ELECTRIC RAILWAY JOURNAL, issue of March 11, this action is a result of a controversy over paving work. The city claims that the railway company has not co-operated with the city in paving work, but that the work has been delayed because of the poor financial condition of the company. The Saginaw-Bay City Railway operates an interurban service between Saginaw and Flint.

Agreement Reached.—Fares will be reduced in Pine Bluff, Ark., as a result of an agreement reached between a committee of the City Council and officials of the Pine Bluff Company. Cash fares will be 6 instead of 7 cents, while books of fifty-fare tickets will be sold for $2.50 instead of $3. An ordinance providing for the new schedule of rates was to be presented to the City Council on March 20, and it is thought that it will be enacted and made effective without delay. The date for the beginning of the lower fares has not yet been decided upon. It is possible that wages of motormen will also be reduced, as it is estimated that the new schedule will mean a $10,000 loss to the company.

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Fare Order Expected

Chicago Surface Lines Put in Their Case—Newspapers Predict New Rate

Another order in the fare case of the Chicago (Ill.) Surface Lines is expected to be entered in the near future by the Illinois Commerce Commission. Lawyers for the city closed their evidence on March 17, and the companies will have their turn on March 28. It has been hinted by some of the newspapers that an order will be entered early in April with a view to its effect in the primary elections of April 11.

Whether this order will be another attempt to fix a 5-cent fare, or a slighter reduction from the 8-cent fare, is uncertain.

Federal Judge Carpenter on March 17 announced that Master in Chancery Morrison would take evidence in the proceedings to determine whether the present injunction against the 5-cent fare order of the commission shall be made permanent. The city insisted that the courts fix a rate of fare, but Judge Carpenter said this responsibility lies with the commission and that he would only have authority to enjoin a confiscatory rate.

During the week ended March 18, Joseph V. Sullivan, assistant to the president of the Surface Lines, was called as a witness by the city. He produced tables showing wages for trainmen and rates of fare in a large number of cities. These showed that the Chicago company has the highest wage scale of any surface railway, fixed under a contract which is being continued from month to month while negotiations are progressing with the union. It was also shown that there were practically as many increases as there were decreases in rates of fare since last November, although the city had contended that all rates were going down.

E. H. Morgan, superintendent of schedules, was another company employee introduced as a witness for the city. He was examined at length on working conditions and their bearing on time tables. He showed that the most onerous of present conditions on the surface lines had been fixed by arbitrators and said he could not tell how the terms fixed in other cities would work out in Chicago.

Among the witnesses for the city was R. A. Cahn of the United States Bureau of Labor Statistics. Mr. Cahn stated that cost of living had decreased 19.7 per cent in Chicago since June, 1920. Representatives of the trainmen's union attended all sessions and it is expected they will ask to be heard before the case closes.

598 Cities Have Increased Fares

The average rate of fare charged by electric railways, based on rates in effect in 275 cities of more than 25,000 population, was 7.37 cents on March 1, 1922. In December, 1917, the average rate of fare was 5.09 cents; in December, 1918, 5.72 cents; in December, 1919, 6.25 cents; in June, 1920, 7.23 cents, and in November, 1921, 7.46 cents. These figures are based on statistics compiled by the information bureau of the American Electric Railway Association. A summary of compilation of cities in which fares have been changed brought down to March 1 follows:

SUMMARY OF COMPILATION OF CITIES IN WHICH FARES WERE CHANGED

Group		Number of Cities	Total Population	Average Population
*1	Ten-cent cash fare	140	8,602,869	61,449
2	Nine-cent cash fare	6	257,500	42,917
*3	Eight-cent cash fare	83	8,032,505	96,777
4	Eight-cent fare, one-cent transfer charge	26	1,741,124	66,966
5	Seven-cent zones	7	333,684	47,669
6	Six-cent city zone, 1-cent charge for rides outside	1	45,393	45,393
7	Six-cent city zone, Six-cent fare outside zones, 2-cent transfer charge	10	469,275	46,927
8	Seven-cent cash fare	169	8,996,529	52,233
9	Six-cent zones	1	41,763	41,763
10	Six-cent zones, average length, 2 miles	1	60,203	60,203
11	Six-cent cash fare	103	5,656,255	54,915
12	Two five-cent zones	2	195,900	97,950
13	Five-cent city zone, five cents outside	14	312,362	22,312
14	Five-cent fare, additional charge for transfers	7	7,212,754	1,030,393
15	Five-cent straight fare, reduced rates eliminated	21	777,135	37,007
16	Five-cent fare reduced from higher fare	7	184,157	26,308
	Total after deducting cities included in more than one group	598	42,919,408	71,772

* The city of Chicago is included in both of these classes, the fare on the elevated lines being 10 cents and the surface lines 8 cents.

Transportation News Notes

Skip Stops Abandoned in Toledo.—The skip-stop plan will be abolished on the lines of the Community Traction Company, Toledo, Ohio, Commissioner Cann told the street railroad board of control at its monthly meeting on March 15. Cars will then stop at every street intersection except in a few instances where intersections are very close together. Signs will be put up to indicate just where cars stop at such points.

Issues Booklet of Schedules. — The Fort Wayne (Ind.) Service Corporation has issued a handy booklet of schedules on all its lines. It is so arranged that the reader may estimate at what time cars are due at any given point. Points of general information which will aid both passenger and company are included in the guide, the transfer system is explained, and the method of loading and unloading of passengers clarified. Fort Wayne is a city of 86,000. The weekly pass is in use in Fort Wayne.

Indianapolis Program Curtailed.—All that is left of the Indianapolis (Ind.) Street Railway re-routing and speeding up program which the Board of Public Works undertook six weeks ago is the cross-town line in Thirty-fourth Street and Fairfield Avenue and the new route of the Riverside cars. The Board of Public Works lopped off another innovation recently when it ordered abandonment of twenty-minute cross-town service in Washington Street between Irvington and Mt. Jackson. The Indianapolis Street Railway submitted figures to show that in nine days there was an average of only thirty passengers a day on the line.

No Reduction in Fares.—At a recent hearing in Aberdeen, Wash., by the Public Service Commission, it was announced that no reduction in fares in either Aberdeen on the Grays Harbor Railway & Light Company, the local property, or Montesano would be ordered, or for intercity travel. The fare is 10 cents, or three tickets for a quarter for either city rides or intercity transportation. The hearing was called upon request of the Aberdeen City Council. E. V. Kuykendal, director of public works department, stated that there was indisputable evidence showing that there was a loss of $36,000 in 1921, and on this showing an order for lower rates, if contested in the courts, would be set aside.

Springfield Crosstown Line Disputed.—A controversy has arisen in Springfield, Mass., over the location of the trolley approaches to the new Connecticut River bridge soon to be opened for use. The Springfield Street Railway has petitioned for a loop around Court Square Extension as the most feasible means of handling traffic without congestion of the business streets, and this proposal has the support of many business men. It is opposed by those who assert that it interferes with the plan to create a beautiful civic center. Several other plans are proposed. The company stresses the necessity of some means of connecting its East Side and West Side lines for through traffic.

Sale of Passes Increases. — The weekly pass system which hase been inaugurated on the Fort Wayne city lines by the Indiana Service Corporation seems to have caught on well with the traveling public. During the first week 2,967 passes were sold and during the second week 3,546 passes were sold, making an increase of 579. The corporation has now made arrangements whereby the passes are on sale Saturdays, Sundays and Mondays by the operators of the cars. After Mondays the passes are on sale at local stores and at the light and power department of the company in the Utility Building. Some confusion has developed relative to transfers since the weekly pass was put into effect. It has, therefore, been announced by the company that transfers will not be issued to passholders and it is absolutely necessary that all passengers paying cash or tokens must request their transfers when they board the car. Otherwise transfers are not issued.

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Personal Mention

A. E. Potter Is Club President

President of United Electric Railways Heads New England Street Railway Club

Albert E. Potter, president and general manager of the United Electric Railways, Providence, R. I., was elected president of the New England Street Railway Club on March 23. Mr. Potter is steeped in railway history and in railway management. He lives, eats and sleeps railway doings. And now as president of the New England club he will crowd more duties into an already active life.

And there is this to say about Mr. Potter. He will find time, in some superhuman way, even if to all unbelievers there is none. Moreover, he will do all his work with the left hand, so to speak, easily, nonchalantly, and lead you to believe that he has an hour or so to loaf with you.

It all amounts to this, that Mr. Potter

A. E. POTTER

is alive every minute. Whereas others may mentally die, and need to slough off their old skins, Mr. Potter is perpetually animated. He can, therefore, do twice as much in half the time.

For thirty-odd years Mr. Potter has been connected with the railways of Rhode Island. For the most part he has been officiating as general manager or president. In 1914 he was elected president of the Rhode Island Company, after serving as general manager of the company from 1906. In 1921, when the Rhode Island Company was reorganized, after more than a year of receivership, into the United Electric Railways, Mr. Potter was made president and general manager.

Mr. Potter showed his capabilities during the period that the Rhode Island Company was in the Slough of Despond. For then the public was criticizing the company and the Mellon control. But Mr. Potter's attitude was universally admired, and throughout the trouble he kept the public with him. His father, who had been president of the traction lines for many years, had the same ability to work with the public. The names of Albert T. Potter and Albert E. Potter stand for right leadership to the people in territories which the lines serve.

Albert E. Potter has proved this fair-minded attitude over and over again in his association with the railway. He started his work in the track department of the Union Railroad, turned switches, directed cars in the congested areas, was everywhere at once to make the transportation system work efficiently. Then he was made superintendent of conductors and motormen in 1895, and established his record for squareness. In 1900 he became superintendent of transportation, the first one to hold the office just created. As some one expressed it not long ago, all the superintendent of transportation has to do is everything the general manager doesn't do, and in addition, hire and discharge all employees, supervise operation of the roads, handle emergencies and keep the cars to schedule time. In 1906 he took R. I. Todd's place as general manager, and had his own chance to look at the superintendent's job from a different angle. After that, it was but a step to the president's chair, increased responsibilities, greater service, and more and more honors. And thus he became president of the New England Street Railway Club.

E. J. Burdick Is Vice-President

General Manager of Detroit United Railway Elected to Board of Directors

Announcement of the appointment on March 11 of Ellsworth J. Burdick as vice-president and general manager of the Detroit (Mich.) United Railway will be received with great pleasure by his hosts of friends in the railway and engineering world. The advancement of Mr. Burdick again exemplifies the old saying that there is always room at the top for the hard and intelligent worker and doer.

Mr. Burdick received his early electrical training with the Brush Electric Manufacturing Company, Cleveland, Ohio, which he joined in 1889. Later he went to the Westinghouse company. In 1895 he went to Detroit to erect the electric machinery for the Everett-Moore syndicate, which was then entering the Detroit transportation field through what is commonly referred to in Detroit as the Pingree 3-cent lines.

Shortly after this came the consolidation of the railway systems in Detroit and Mr. Burdick was retained as one of the force in charge of the electrical and power distribution systems. In this work he came under the direct notice of such men as J. C. Hutchins, Albert H. Stanley and F. W. Brooks. These men were so impressed with Mr. Burdick's natural ability that he was used in special investigation work, particularly in the taking over of the many interurban lines that became a part of the extensive Detroit United System of nearly 1,000 miles of track.

In 1901 Mr. Burdick became superintendent of power and in the years that followed he continued the investigation of many of the problems arising in the company, so that his knowledge of his own particular field became supplemented by a fund of information of all the departments. In 1916 he was made assistant general manager, and gradually relieved Mr. Brooks, then president, of many arduous details, particularly during the later years when Mr. Brooks' health began to fail.

At the annual meeting of the stockholders of the company in February of this year, when a considerable revision was made in the directorate of the company, Mr. Burdick was the unanimous choice for general manager of the properties. This appointment has since been followed by his election to the board of directors and to the vice-presidency. He remains general manager as well. The recent honors conferred on Mr. Burdick are not only gratifying to his many railway and engineering friends throughout the country but are particularly pleasing to his fellow workers in the Detroit United Railway.

E. J. BURDICK

Mr. Burdick has taken active part in the work of the American and the Central Electric Railway Associations. He is past-president of the Detroit Engineering Society, a member of the American Society of Mechanical Engineers and is a registered mechanical and electrical engineer in Michigan.

While Mr. Burdick is a tremendously vigorous worker, he is also a firm believer in recreation, which he finds at his summer home on Briggs' Lake, a two hours drive out of Detroit. There behind his house is his garden, while in the waters in front the finny tribe abounds.

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B. R. T. Makes Appointments

John Weigel, Charles Johnson, Harry Dittmar Are Made Division Superintendents

The appointment of three division superintendents of the Brooklyn Rapid Transit Company, New York, N. Y., has been announced. John Weigel, assistant superintendent at DeKalb Avenue Depot, has been appointed division superintendent of Crosstown Division to take the place of J. J. Riley, who resigned on Nov. 30, 1921. Charles Johnson, assistant superintendent at Franklin Avenue Depot, has been raised to the rank of division superintendent of Franklin Avenue Division. Harry E. Dittmar, supervisor of the Power Saving Department, has been made division superintendent of DeKalb Avenue Division.

John Weigel, the new superintendent at Crosstown, is a man of wide and varied experience in street railroading. He started upon his career as a railroader in 1896, when he went to work as a motorman at Fifty-eighth Street Depot. By the end of 1897 he became an inspector and in the following year he was made general inspector for the whole Surface Transportation Department.

In 1899, Mr. Weigel was appointed assistant superintendent of Canarsie Depot and a year later he was made chief of the time-table department, a position he held for more than fifteen years. In 1916 he resigned to enter the employ of the United Gas & Electric Engineering Corporation, Manhattan. For this corporation he spent one year in traveling to inspect the various properties in which the corporation was interested. One of its properties was the International Railway, which operates in Buffalo, Niagara Falls and Lockport, and in 1917 Mr. Weigel was made general superintendent of this company with headquarters in Buffalo.

Mr. Weigel, after severing his connection with the United Corporation and its properties in 1920, spent six months doing special work for various railway companies, among them the Lancaster Railway, the Elmira Railway and the Boston Elevated Railroad.

From September, 1920, to his present appointment, Mr. Weigel has been assistant superintendent in charge at DeKalb Avenue Depot.

Charles Johnson, who was appointed division superintendent of Franklin Avenue Division on Jan. 15, has been in the employ of the company for nearly twenty-nine years and more than twenty-seven years of this time he has spent in one depot, Bergen Street, in various capacities. He entered service at Bergen Street Depot as a conductor in March, 1893. He was successively motorman, register taker, inspector and chief inspector of the Central Division. He also held the posts of night depot master and day depot master and just before his new position, he had that of assistant superintendent of Franklin Avenue Depot.

Harry E. Dittmar, division superintendent of DeKalb Avenue Division, has been with the company for more than sixteen years. His first position was that of motorman at Maspeth Depot, in 1905. Four years later he became a register inspector and in 1912 a special inspector and was assigned to the Time-table Department.

Mr. Dittmar was made supervisor of headways in 1920, and later that year he was made assistant superintendent in charge at Maspeth Depot. On Jan. 1, 1921, he was appointed supervisor of the power saving department, in which capacity he was serving when his recent appointment as division superintendent at DeKalb Avenue Division took effect.

H. E. DITTMAR

JOHN WEIGEL

CHARLES JOHNSON

Col. H. H. Dean has been appointed district counsel of the Georgia Railway & Power Company, Atlanta, Ga. He has been with the company for several years, and will now have charge of cases in the northeastern Judicial Circuit.

Marion B. Bracken, assistant to the chief of the claim department of the United Railways, St. Louis, Mo., has been with this department of the company for twenty-five years. Members of the company gave a banquet in his honor recently to celebrate his excellent service.

L. F. Wynne, general claim agent of the Georgia Railway & Power Company, Atlanta, Ga., was recently elected vice-president of the Southeastern Association of Claim Agents. The association has as members claim agents of steam railroads, electric railways and power companies.

L. T. Peck, for many years president of the Honolulu Rapid Transit & Land Company, Honolulu, H. I., has retired from that position. A. L. Castle, formerly secretary of the company, has been elected president to succeed Mr. Peck. Mr. Peck continues with the company as chairman of the board.

E. G. Connette, president of the United Gas & Electric Corporation, was recently elected a director of the White Oil Corporation. W. B. Emmert, a vice-president of the United Gas & Electric Engineering Corporation, of which Mr. Connette is also president, was elected a director of the White Oil Company at the same time. George Bullock, who is connected with the United Gas & Electric Company, was made a director also.

J. C. Walter is now master mechanic of the Danville Street Railway & Light Company, Danville, Ill. He has been with the Illinois Traction System, Peoria, which owns the Danville company, for eleven years, beginning as freight car repairman. He became successively chief freight car inspector and general foreman of the passenger car department.

Obituary

Edward H. Ives, assistant general superintendent of the Detroit (Mich.) United Railway, died on March 19 as a result of injuries received when an interurban train of the Detroit United Company struck the automobile which he was driving.

E. H. Sellers, for many years chairman of the tramways committee of Huddersfield, England, died recently. His position on the board of aldermen as chairman of the tramways committee placed him practically as the operating head of the Huddersfield Corporation Tramways. During the war his duties were extremely arduous.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Census Bureau's First Report on Lumber Prices

The first report on mill prices of lumber was issued the middle of February by the Bureau of Census of the Department of Commerce. It gives an average of the prices of actual sales of lumber at the mills. The reports were obtained by the Bureau of the Census directly from the mills. Each item price published is a simple average of the prices reported on that item.

The 1919 average, the 1920 average and October, November and December, 1921, figures are given for ten representative items of Southern pine, Northern pine and red cypress, respectively; for nine items of Douglas fir and three of hemlock.

Hardwood prices as given are from Northern mills only, the majority of which are located in Wisconsin and Michigan.

AVERAGE MILL PRICES PER THOUSAND FEET

	Southern Pine		Douglas Fir	
	No. 1 Common 2 in. x 4 in. x 16 ft. SISIE	B and Better Flat Grain Flooring 1 in. x 4 in.	No. 1 Common 2 in. x 4 in. x 12 ft.—14 ft. SISIE	No. 2 V. G. Flooring 1 in. x 4 in.
1919 average	$38.51	$49.82	$22.48	$48.27
1920 average	48.41	73.56	26.73	62.64
1921 October	25.55	43.93	.....	.....
November	29.50	47.80	11.72	49.84
December	29.91	49.01	13.36	50.58

	Northern Pine		Red Cypress	Hemlock
	No. 1 Common 2 in.x4 in.x12ft.—16 ft. SISIE	No. 1 Common Flooring Flat Grain	No. 1 Common Flooring Flat Grain	No. 2 Common
1919 average	$43.33	$59.75	$49.50	$32.24
1920 average	44.33	73.33	65.83	42.94
1921 October	24.00	65.00	.....	20.34
November	28.83	65.63	43.50	22.65
December	.....	.....	43.38	.....

P. R. T. Buys 2,181 More Meters

The Philadelphia (Pa.) Rapid Transit Company has contracted with the Economy Electric Devices Company for what is probably the largest single order for power-saving devices ever placed. This comprises 2,181 Sangamo Economy watt-hour meters having the power-saving and car-inspection dials. It will provide a complete equipment for all the surface cars and principal utility cars owned by the company.

The study of power-saving devices by this company began as far back as the fall of 1917. This led up to a forty-five-car competitive test in the spring of 1919. The savings which were effected on this occasion evidently satisfied the company as to the merit of the watt-hour meter, for an order for 310 meters was placed in February, 1920. These meters made a complete equipment for the cars of the Callowhill division. The installation of the meters began early in May and was completed in August, these being the first meters to be placed in use having the car-inspection dials of the present design. An article on this installation appeared in the ELECTRIC RAILWAY JOURNAL for Feb. 19, 1921.

From the experience on this one division over a period of eighteen months' operation, the company was convinced by October, 1921, of the value of the meters and was ready to extend their use over the entire system. But to make sure that there were no new developments which could better the showing made by the meters, another competitive test was conducted on two representative routes with different groups of cars on each route. The devices were masked and normal figures of power consumption were first obtained. Then the power-saving test was started early in December and lasted until Christmas. The test satisfied the company as to the efficiency of the Economy meter in inducing savings under the severe operating conditions imposed by Christmas traffic and winter weather, as the order for the complete equipment of the entire system followed.

Proposed Merger of Machine Tool Manufacturers

A rumor has been rife for several weeks of the merger of several leading machine tool manufacturing companies. It is now possible to announce that the plans for the merger have finally been completed, and while the name of the new corporation has not definitely been decided upon an official announcement will probably be made shortly. The new company will be not only one of the largest machine tool organizations, but one of the largest mergers of machinery manufacturing concerns that has ever been formed.

The companies included in the merger are the Lodge & Shipley Machine Tool Company, the Carlton Machine Tool Company, Newton Machine Tool Works, Inc., Betts Machine Company, the Colburn Machine Tool Company, Hilles & Jones Company, Modern Tool Company, and Dale Machinery Company.

Bulletin on Coal Supply Issued

The Coal Bureau of the Natural Resources Department of the Chamber of Commerce of the United States recently issued a bulletin giving an analysis of the coal situation, the purpose of which is to give business men information regarding possible fuel supplies in the event of a strike of miners on April 1. The bulletin concludes with a summary of statements from 648 typical retail dealers showing the days' supply of coal usually carried by them on April 1 and also in the hands of various classes of consumers.

Pacific Electric Purchases New Equipment

President Paul Shoup of the Pacific Electric Railway, Los Angeles, Cal., has advised the California Railroad Commission that he had ordered fifty new cars required by the commission at the time of the readjusted fares. The cars ordered are of all-steel construction and will have center entrances. Each will have a seating capacity of sixty-five passengers.

The cars will be used exclusively on the Hollywood line in accordance with the commission's order. They will supplant cars of the old type. The equipment has been ordered from the St. Louis Car Company and the Westinghouse Manufacturing Company and will cost $800,000. The contracts call for delivery within four months and the cars will be put in service as soon as they are received and equipped for operation.

With the cost of new equipment just purchased, cost of the new subway construction and acquisition of additional rights-of-way for this improvement, the Pacific Electric Railway will during the year 1922 have made a capital expenditure of approximately $3,000,000 in additions and betterments to its service.

Metal, Coal and Material Prices

Metals—New York	March 21, 1922
Copper, electrolytic, cents per lb.	12.875
Copper wire base, cents per lb.	14.125
Lead, cents per lb.	4.725
Zinc, cents per lb.	5.037
Tin Straits, cents per lb.	29.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.575
Somerset mine run, Boston, net tons	1.875
Pittsburgh, mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.90
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	1.94
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	89.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	85.00

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Rolling Stock

Savannah (Ga.) Electric & Power Company has ordered thirty one-man cars, planning to reduce its operating expenses.

Southern Pacific Company, Portland, Ore., has just received twelve new electric cars which cost approximately $400,000. These are being assembled at the Beaverton shops and will be used for service on the Southern Pacific electric lines in Oregon.

Interstate Public Service Company, Indianapolis, Ind., has ordered from the Cincinnati Car Company the five lightweight, one-man, interurban cars referred to in the ELECTRIC RAILWAY JOURNAL for March 11. These will be used to give suburban service between New Albany and Jeffersonville, Ind., and Louisville, Ky.

Track and Roadway

Brockton & Plymouth Street Railway, Plymouth, Mass., within the next few weeks expects to rebuild two miles of track.

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., will rebuild three to five miles of track using new ties and rails.

Meridian Light & Railway Company, Meridian, Miss., is extending its East End Thirteenth Street line from Sixteenth Avenue north to connect with the Ninth Avenue line.

Savannah (Ga.) Electric & Power Company is planning to spend $375,000 in improvements during 1922. Last year the company spent about $120,000 in extensions and improvements.

Eastern Wisconsin Electric Company, Sheboygan, Wis., has been granted permission by the city to extend its track on the south side of the city. About a mile of line will be installed.

Calgary, Alta. — The street railway department in charge of the local municipal railway has applied to the City Commissioners for authority to call for tenders for thirty-five tons of steel rails to be used on Centre Street.

Tri-City Railway, Davenport, Iowa, will soon start in on its Fifteenth Street paving project and will put in new rails. The improvement will cost more than $100,000. At the same time the city will start work on its part of the paving program.

Chicago & Joliet Electric Railway, Joliet, Ill., expects to rebuild 5,700 ft. of double track, paved with brick, on its interurban line through the city of Lockport within the next ninety days. No material has as yet been purchased for this job.

Pacific Electric Railway, Los Angeles, Cal., expects soon to authorize the double tracking of its line on Broadway between Olive and Bonito Avenues. The tracks will cross those of the Salt Lake Railroad. The company will begin soon to negotiate for a franchise covering this improvement.

Cape Fear Railways, Inc., Fayetteville, N. C., expects to start work on the extension to Camp Bragg soon, in order that construction may be completed by June 1. Cross ties and rails have already been purchased and construction has been started at the Camp Bragg end.

Trenton & Mercer County Traction Corporation, Trenton, N. J., proposes to lay a spur track from its power house on Lincoln Avenue and place cables underground. This will affect thirteen land owners who own the strip, 40 ft. x 20 ft., which is desired by the company. Justice Trenchard in the New Jersey Supreme Court has appointed three commissioners to appraise this strip of land, located on Seward Avenue.

Arkansas Valley Interurban Railway, Wichita, Kan., is making track connections at Hutchinson with the steam roads, at an expenditure of about $25,000 and involving about ¾ mile of track. Track connections are also being made at Sedgwick at an expense of several thousand dollars. A new steel concrete bridge is to be built soon, at a cost of about $5,000, which will make practically every bridge on the line steel concrete.

Power Houses, Shops and Buildings

Ohio Electric Railway, Lima, Ohio, will have to construct substations at Yoder, New Hampshire and Huntsville owing to a change in the cycle of current.

Philadelphia, Pa.—The Director of City Transit has announced that sealed proposals for "cable connections for Power Feed and Negative Return, Contract 644" and for constructing an "Addition to the Car Inspection Shop in the Bridge Street Yard, Contract 648" for the Frankford Elevated Railway will be received at the Director's office until Thursday, March 30.

Arkansas Valley Interurban Railway, Wichita, Kan., is constructing a new brick concrete station at Halstead, which with some track connections will cost about $8,000. Contract has been let for this improvement. The company is also proposing to build an addition to its shops during this summer, also putting in some six miles of additional feeder wire from one of its substations.

Los Angeles (Cal.) Railway has placed orders for new electrical equipment to be used in two new substations involving an expenditure of approximately $250,000. The substations will be located in the southwest section and northwest area respectively. The new stations will operate automatically like the Vernon and Garvanza stations, which have been referred to previously. The machinery will be furnished by the General Electric Company.

Trade Notes

McClellan & Junkersfeld, Inc., New York, N. Y., have been engaged as engineers and constructors for the new power plant which the Union Electric Light & Power Company is building on the Illinois side of the Mississippi River, south of the city limits of East St. Louis.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has appointed C. E. Skinner, manager research department, as assistant director engineering in that company. His duties as assistant director will cover research, standards and other work along these lines. He will be located in the main engineering offices at East Pittsburgh.

E. C. Stockdale, general sales manager of Page & Hill Co., with offices in Chicago, recently resigned. It is understood that the sales of the company will be directed from the home office in Minneapolis in the future. W. D. Schneider has been appointed manager of the Chicago office of the company with sales jurisdiction over Illinois, Indiana and Ohio, and the southern half of Wisconsin.

Diamond Power Specialty Corp., Detroit, Mich., has taken over the business and plant of the Diamond Power Specialty Company, which formerly conducted the Diamond Soot Blower business. Norman L. Snow, formerly of the Terry Steam Turbine Company, has been elected president and treasurer of the new company. Mr. Snow is a graduate of Yale Scientific School and Massachusetts Institute of Technology, and has been in the power plant field for the past eighteen years.

Daniel E. Costigan, late captain and inspector of police in New York, who recently retired from the Police Department, has established a private detective agency in the Mills Building, 15 Broad Street, New York. Captain Costigan has been recognized as a man of exceptional ability by such police commissioners as the late Theodore Roosevelt, General Bingham and General E. V. Greene, and his cognomen in New York has been "Honest Dan." He is prepared to undertake public utility business.

New Advertising Literature

The Martindale Electric Company, Cleveland, Ohio, has issued a new four page circular on Commutator Grinding and Slotting, which fully describes its Imperial Commutator Stones and other devices for undercutting mica.

Century Wood Preserving Company, Pittsburgh, Pa., has just issued a bulletin on storing and seasoning railway ties. This gives information on air and steam seasoning and the factors influencing the type of seasoning used. Information is also given in connection with the handling of ties in storage.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MACMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, April 1, 1922 — *Number* 13

A Large-Scale Application of Machines in Track Construction

FEW electric railways have the opportunity for wholesale reconstruction that has been presented to the Toronto Transportation Commission during the past eight months. Also, and in some ways fortunately, few are obliged to do so much work with such a short period available for preparing and executing plans. The circumstances will recall to the old timers the situation in the '90s, when the streets of all of the important cities in the country were torn up incident to electrification of the erstwhile horse and cable railways.

The performance in Toronto, of course, differs from those of the early days in the large substitution of machines for men. Then labor was cheap, while machinery was scarce and dear. Now most of the energy-consuming operations are, on progressive railway systems, being performed by means of apparatus driven by electric, steam or gasoline motive power.

The work performed during the latter half of 1921 in Toronto was so great in extent that it has taken several months to evaluate it and check the data. The results of the study of the accomplishment, made by members of the ELECTRIC RAILWAY JOURNAL staff, are given *in extenso* this week. Their study has emphasized the importance of the position now occupied by track standards, especially those of the American Electric Railway Association. This should furnish encouragement to the faithful engineers who for years have lavished time and energy on the work. To the availability of these standards, combined with the possibility of applying them with the aid of machinery, must be assigned a fair share of credit for the success of the Toronto rehabilitation program.

Wanted: Some Old-Fashioned Selling in the Railway Field

TWO reasons prompt this comment. One is that the salesmen of this paper bring in the report too frequently that a manufacturer is saturated with the idea that the electric railway field is dead, that it is a waste of effort and money to cultivate it further, and that if any orders were placed the money to pay for the supplies would be lacking. The other reason is that within the last thirty days three prominent executives in well-separated parts of the Middle West, without any leading questions to bring out the statement, have declared that the salesmen who are calling on them these days seem to have forgotten they are out to sell. As one of these executives put it, "You make one harsh remark to them about their product and they are all done; they immediately get away from the business of their call or make preparations to get out as gracefully as possible."

These two things go together and bear joint treatment. How can a salesman be expected to go out and do a real job of selling when the support of his boss is undermined with pessimism? The salesman's reports are expected to be just what he turns in—expense accounts—and, conversely, the salesman is not concerned at having to turn in reports of no sales, for he knows these are expected and so he doesn't get down to real old-fashioned selling.

The only thing wrong is that these "Gloomy Guses" are asleep; their pessimistic attitude of mind has not permitted them to see the changing condition of the industry. For not in five years have there been greater signs of activity in the electric railway field, nor a better average credit standing. The industry is gaining substantially in financial soundness and the news pages of this journal are full of reports indicating better margins between gross earnings and operating expenses, dividends resumed or good prospects of them, and large programs of betterment. One has only to read to be convinced, and the supply members of the industry are urged to peruse the pages of the ELECTRIC RAILWAY JOURNAL since the first of this year. The signs of the times are truthfully reflected there and manufacturers and salesmen will do well to read the business paper of their industry as they ought to if they would be alert to the rapidly changing circumstances and ready to capitalize them.

Chicago Is Good Location for the 1922 Convention

CHICAGO has been definitely selected as the location for the convention of the American Electric Railway Association this fall. Much sentiment throughout the country, particularly in the West and Southwest, was inclined toward a central location this year, and concurrence with these wishes and the central location itself should result in a very large attendance. For Chicago now has admirable and adequate facilities for this convention with the extensive exhibits and various simultaneous meetings and many social events, and also has ample hotel accommodations. Both exhibits and meetings will be held on the wonderful Municipal Pier, which extends nearly a mile out into Lake Michigan. It has the advantage, in a way, of being located somewhat away from the loop district, which will tend to keep the whole convention attendance together all day and isolated from distractions. Yet it is within walking distance of Chicago's newest and finest hotel, the Drake; and street cars, motor buses and Chicago's famous Yellow Taxis make the pier only a few minutes removed from the loop hotels.

October weather in Chicago is almost invariably delightful, and the weather man has agreed to fix up a concoction that will insure fair weather for the first week of October this year. Aside from the convention proper, Chicago holds forth other important business attractions. It is the home of the world's largest street railway system, which offers a host of things of particular interest for study. There is an extensive ele-

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vated railroad system. There is the North Shore Line running between Milwaukee and the Chicago loop, over which no interurban operating men who attend the convention should fail to ride if they would see a most impressive object lesson of what an electric railroad can be. Then there is the opportunity to study the newer phase of the business—motor bus operation, as carried on by the Chicago Motor Bus Company, the Depot Motor Bus Lines, Inc., and other smaller bus companies in suburban and interurban service.

So with the most accessible place in the country as the meeting point, with a most attractive meeting place and exhibits assured, this ought to produce the largest attendance ever recorded at an A.E.R.A. convention. It is anticipated, also, that exhibitors will be very favorably impressed with the unusual transportation facilities and general ease of handling machinery and material and equipment to and from their spaces on the Pier. The task now set is to insure a good program and then advertise it well so that the convention may be a great success in point of accomplishment and breadth of influence.

How to Get Rid of the Jitney

THE jitney has often been called a product of hard times. It is therefore not surprising that during the present season of unemployment jitneys have increased in a number of places. In most cases they are purely piratical in that they confine their services to the profitable hours and short hauls in a city, leaving the longer hauls and less profitable hours of service to the railway. It is also true that in many, if not most, cases the jitneys are unsanitary and disregard most of those requirements, such as responsibility for damages, which have been accepted for centuries as obligatory on common carriers. Nevertheless they get considerable business, even at a fare which is sometimes slightly more than that charged on the parallel trolley lines. The trouble is not one to which the railways only are liable. Legitimate bus routes are subject to this form of attack.

A consideration of what the jitneys supply which is absent from the trolley service will help in determining what remedies are available. The case of the bus line will be considered later.

One advantage of the jitney is undoubtedly frequency of service. A would-be passenger in a hurry is apt to take the first conveyance which comes along, whether it is a jitney or a car. The second advantage is speed, possible because of the smaller number of stops. Then the jitney will undoubtedly get some special business where it does not operate over the exact route of the trolley line.

There are four principal ways by which the jitney can be combated. No one is always sufficient but it must be combined with one or more of the other methods.

The first of these is restrictive legislation. The unfairness of allowing a tax-free vehicle to take the best part of the business and requiring the tax-burdened carrier to haul the long-distance passengers, as well as the neglect by the ordinary jitney of maintaining schedules, paying damages and carrying out other requirements associated with common carriers, may be shown. Some companies have gone so far as to give an object lesson of the necessity of making the choice between the two modes of travel by shutting down the trolley service, as in Augusta now.

The second method is to improve the trolley service, particularly in the way of higher speed and more frequent service. Much more can be done in this way than is often realized, especially by companies which have not introduced one-man car operation with high-powered motors so that they can accelerate quickly. Here also there is opportunity for the transportation engineer to show his ability to speed up car service by changes in routing, introduction of island platforms, improvement in traffic control, checking up schedules, etc. For meeting jitney competition the skip stop is probably not so desirable as the other means mentioned for speeding up the cars. With one-man cars the smaller number of stops required brings about largely the same results as the skip stop, yet offers the same advantages of convenience to the passengers as the jitney.

A third method for combating jitneys, which has been employed to advantage in certain places, is the weekly pass. A large corporation furnishing transportation service in all parts of the city is obviously in a far better position to offer a worth-while pass than a single jitney operator or even a group of them. In consequence, the trolley line gets all the business not only of the passholders but also of those who may accompany the passholder on his trips.

The fourth means by which companies have attacked the jitney situation is by the operation of a bus service themselves. This can be done to advantage in some circumstances, but is hardly advisable where there is no restrictive legislation against competition, because it would substitute a responsible bus service for an irresponsible one, and the company would probably lose money on both services. When, however, the authorities recognize the necessity for a co-ordinated service, the offer of the railway company to operate a bus on a route not covered by a trolley line may keep out a competing bus service.

Where jitneys raid the earnings of responsible bus lines, obviously the three remedies first mentioned are equally applicable.

Small Motor Cars for Use in Work on Track and Line

THE men who are responsible for the track and line maintenance on electric railways have to some extent and for some time appreciated the value of using motor cars and trucks for emergency repair work. The use of small automobiles or motor-cycle cars for other maintenance work is also increasing. The motor cycle with side car has apparently solved the track-greasing problem in Tampa, Fla.; and a sanding or salting car has proved to be a real labor saver for the New York State Railways at Utica, N. Y. The Brooklyn Rapid Transit Company uses a light truck effectively in connection with a portable welding outfit. The chief advantage in the use of these cars lies in their ability to hurry from point to point, wherever their service is needed, by the shortest route and without regard to car operation. Also the use of a self-propelled car conduces to better work because, where men travel from point to point on passenger cars, their work is sometimes done hurriedly in order to permit them to catch the next car.

The saving made in labor resulting from the use of the small cars is easily sufficient to pay the cost of operating and maintaining them.

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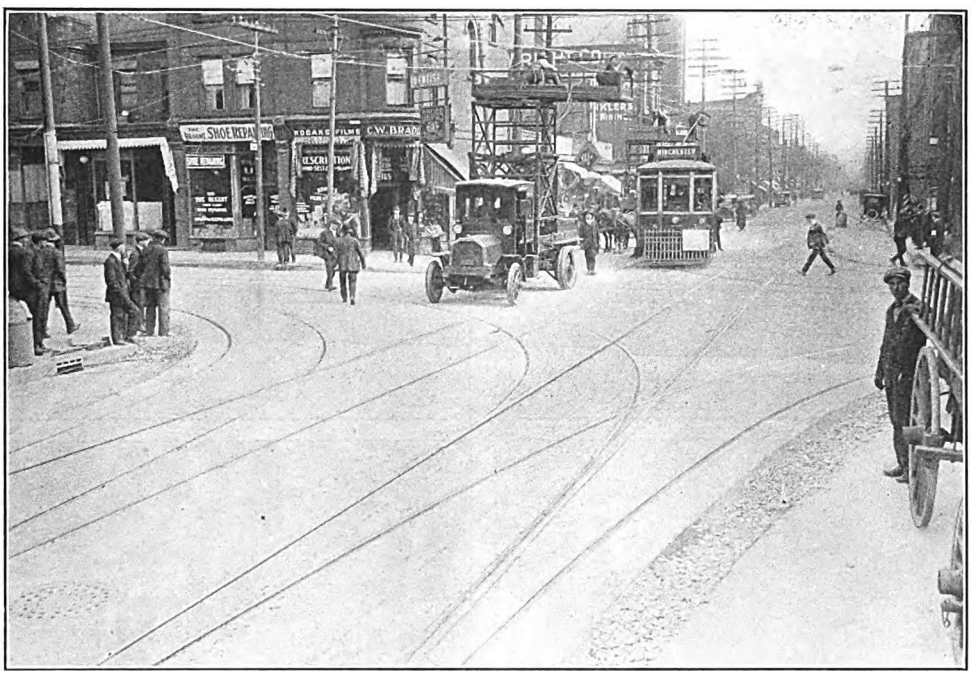

TYPICAL FINISHED TRACK CONSTRUCTION IN TORONTO—INTERSECTION AT QUEEN AND CHURCH STREETS

Expediting Track Construction in Toronto

Although the Transportation Commission Had a Late Start on Its Big Rehabilitation Program, Rapid Progress Was Made on the Work Until Winter Set In, Due to the Advance Standardizing of Materials and Procedure and the Extensive Use of Machinery

ON SEPT. 1, 1921, the Toronto Transportation Commission* took over the property of the Toronto Railway and also the Civic Railway lines, previously operated by the city government. The single-track mileage of the Toronto Railway was approximately 143 and that of the Civic Railway 22, a total of about 165 miles. With the exception of about 15 miles of single track, which will ultimately become the property of the city, the commission now operates all of the electric railway lines of the city.

The accompanying map shows the track layout of the city system when it was taken over. The total mileage already mentioned includes 75 miles of double track and 14½ miles of single track, with a rather elaborate system of special trackwork for looping and turning back cars in the downtown district. The commission inherited a track rehabilitation job which was of great magnitude for two reasons: First, on account of the unsettled conditions of the past two years incident to negotiations between the city and the Toronto Railway, the track had been allowed to run down; and second, the standard devil strip width of the Toronto Railway was only 3 ft. 10 in., which was too narrow for operation of cars of the modern type which the commission planned to use. On the Civic Railway the devil strip width, in conformity with a recent civic by-law, was 5 ft. 4 in. and this was adopted as standard throughout. This will give a clearance between new cars of not less than 12 in. In this connection it may be noted that the Toronto Railway, in order to operate a few wide double-truck cars, had to offset the bodies on the king pins to overcome danger of side-swiping of passing cars.

Four months before the commission took over the railway lines, it appointed A. T. Spencer, formerly on the engineering staff of the Montreal Tramways, as engineer of way. Mr. Spencer immediately set about the building up of an engineering organization, as shown in the diagram on page 555, and developed a system of standard specifications and procedure. A special section to handle excavation and concrete work was organized under the direction of A. E. Gibson, a prominent Toronto engineer who specializes on concrete work. As far as possible the standards of the American Electric Railway Association were adopted. The effectiveness of this organization is shown by the fact that it succeeded in laying 12 miles of track extensions and additions, including carhouse yards, and rebuild 13

PAVING GANG GROUTING GRANITE BLOCK PAVING

*The Transportation Commission consists of three members. P. W. Ellis is chairman, the other members being George Wright and F. R. Miller. The general manager is H. H. Couzens and the assistant manager D. W. Harvey. The headquarters of the commission are at 229 Yonge Street.

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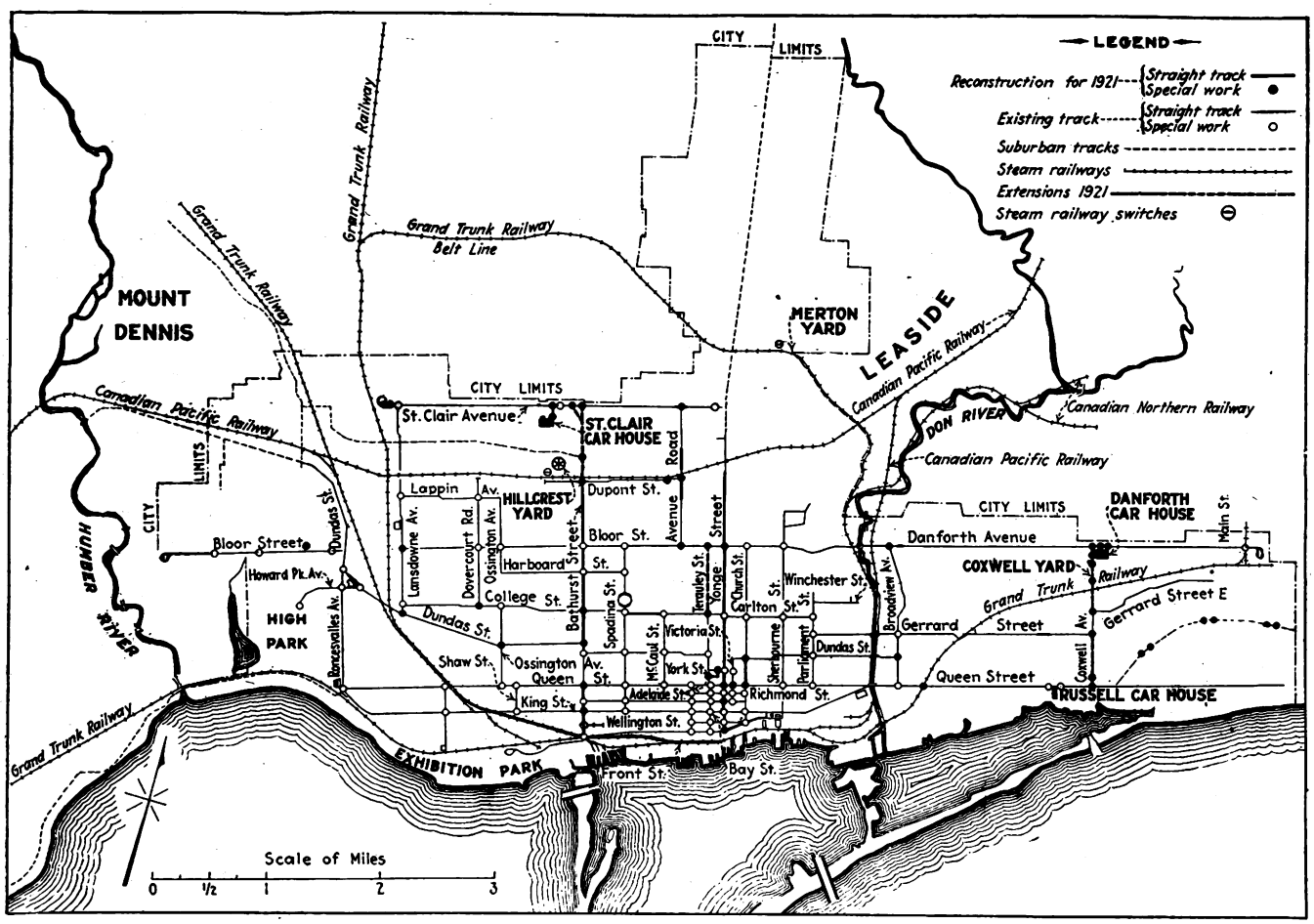

OUTLINE MAP OF TORONTO, ONT., SHOWING RAILWAY LINES NOW UNDER CONTROL OF TORONTO TRANSPORTATION COMMISSION

miles of track, much of it under traffic, including more than 100 pieces of special trackwork, during the last four months of 1921. The nature of the special trackwork construction is indicated in an accompanying table.

Within a few days after the commission took control of the railway lines, actual construction was begun. The force was gradually increased until on Oct. 20 it reached its peak. On that day there were twenty-three jobs under way, employing 2,754 men in addition to the regular operating force, 112 teams and 141 motor trucks. This personnel does not include the necessary field and office engineering construction forces.

WHAT THE REHABILITATION PROGRAM INVOLVES

As will have been inferred from the figures already given, the task in front of the way department on Sept. 1 was a staggering one. Each of the numerous jobs would, under ordinary conditions, have been large enough to be of special interest to track engineers. Taken as a whole, the job is almost bewildering. Here are just a few of more than thirty large jobs substantially completed in the first ten weeks of work: New double-track line on Coxwell Avenue from Queen Street to junction with Toronto Civic Railway, 2,900 ft. Intersection at Coxwell Avenue and Danforth Avenue, of solid manganese steel, being a double-track three-part wye. New double-track line on Bathurst Street from Dupont Street to connection with Toronto Civic Railway, equivalent to 5,564 ft. of single track. Rehabilitation of northbound track on Church Street from Queen Street to Dundas Street, 1,250 ft. of new single track. Rehabilitation of double track on Yonge Street from Front Street north to Carlton Street, 4,396 ft. Rehabilitation of 1,800 ft. of track on College Street between Spadina Street and McCaul Street, with new rails and widening of devil strip.

TYPICAL PIECES OF SPECIAL TRACKWORK IN TORONTO 1921 PROGRAM*

(See map for location of these pieces)

Location	Details of Special Trackwork	Shipping Weight in Pounds
Danforth and Coxwell	Double-track three-part wye	85,700
Queen and Coxwell	Double-track three-part wye	87,860
Gerrard and Coxwell	Double-track right-hand branchoff	38,090
Broadview and Danforth	Repair pieces	36,040
St. Clair and Vaughan	Single-track wye from double track	46,700
Danforth and Hillington	Single-track facing wye	35,850
St. Clair and Wychwood	Double-track three-part wye	83,740
Church and Queen	½ grand union	136,920
Queen and Victoria	½ grand union	158,560
Bloor and Yonge	½ grand union	166,370
Dundas and Ossington	Double-track crossing	47,060
Gerrard and Coxwell	Additional curve	23,950
Terrauley and Albert	Left hand single-track branchoff from double track	18,320
Louisa and James	Right hand single-track branchoff from single track	15,770
Queen and Yonge	¼ grand union	170,380
Dundas and Broadview	Double-track three-part wye	88,060
Reverse curves Dundas and St. Patrick		23,720

* All solid manganese switches, mates, frogs and crossings.

GETTING READY FOR SEPT. 1

Preparation for the activities of the fall involved: (a) Preparing specifications for track, track supplies, rails, special trackwork, etc. (b) Laying out a schedule of procedure. (c) Providing personnel and tools for carrying out the program. (d) Arranging for material storage yards and transportation to prevent delay.

Soil conditions in Toronto rendered two types of track construction necessary, one for use on a firm soil foundation and the other for locations where a sub-base was necessary. A. E. R. A. grooved girder rail weighing 122-lb. per yard was selected as standard for

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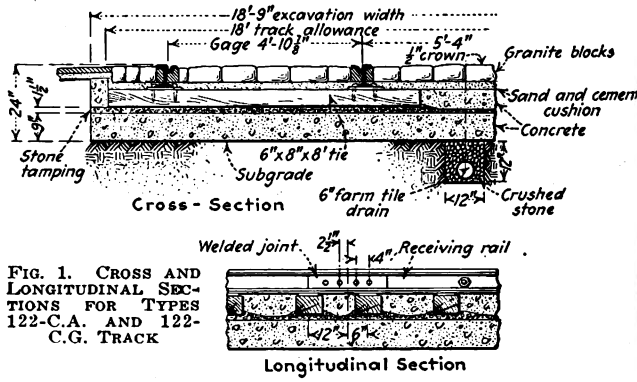

FIG. 1. CROSS AND LONGITUDINAL SECTIONS FOR TYPES 122-C.A. AND 122-C.G. TRACK

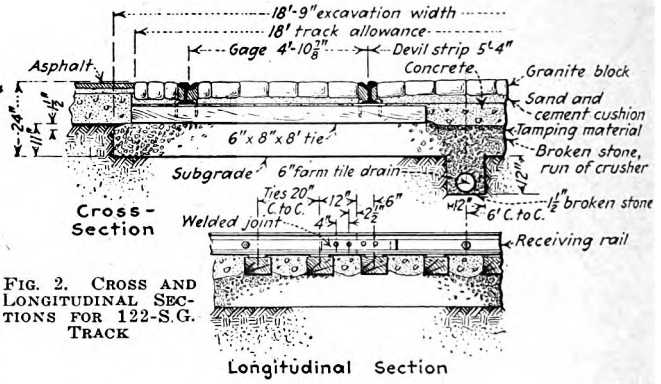

FIG. 2. CROSS AND LONGITUDINAL SECTIONS FOR 122-S.G. TRACK

Toronto Transportation Commission Track Standards

Specifications for Track Type 122-C.A. and 122-C.G.*

Rail — Commission standard 122-lb. grooved girder rail, 7 in. high, as met by United States Steel Products Company Sect. 122-491, or Bethlehem Steel Company Sect. 122-407-A.

Ties—6 in. thick by 8 in. wide by 8 ft. long, and made of soft wood for use with standard tie plates, or No. 1 white oak for use without tie plates. (See Fig. 3 for standard tie plate.)

Spikes—Standard, 5½ in. by $\frac{9}{16}$ in. (See Fig. 4 for standard spike.)

Tie Rods—5 ft. 3 in. long by ⅞ by 2½ in. flat, with 1-in. round terminal.

Joint Plates—of standard type. (Typical standard shown in Fig. 5.) Welded top and base. Plates set in tight with four bolts. After welding two bolts may be removed.

Bolts—1 in. in diameter and of such length as to take full nut and not to exceed ½ in. outside nut.

Excavation—Wearing surface to be removed and total excavation made to a depth of 24 in. below finished grade of top of rail. Width of excavation to be sufficient to lay a slab of concrete 8 ft. 6 in. wide for each track.

Drainage—Except in cases requiring special attention under-drainage shall consist of 6 in. farm or bell-mouthed tile drain laid in the center between tracks in a trench 12 in. wide by 12 in. deep, filled to subgrade with clean 1½-in. stone.

Foundation—Of concrete slab or slabs 9 in. thick. Proportion of concrete to be 1 of cement to 2½ of clean sharp sand and 5 of crushed trap rock.

Cushion—To consist of best obtainable material, preferably ⅜-in. crushed limestone mixed with limestone dust.

Paving Base—To be of concrete of the proportion: 1 of cement to 3 of sand and 6 of crushed limestone or gravel.

*These symbols indicate weight of rail (122-lb. grooved girder), type of foundation (concrete), and types of wearing surface (asphalt and granite block, respectively).

GENERAL ITEMS

Gage of track to be 4 ft. 10⅞ in., and double track construction to be laid to 10 ft. 2⅞ in. centers.

Ties to be spaced 2 ft. center to center except at joints, where tie under receiving rail shall be placed so that edge is 2 in. from the joint. Ties to be placed at right angles to rail.

Rails to be laid with opposite joints, with no variation of more than 2 in., and wherever possible all four rails of a double-track to be laid with opposite joints.

Rails to be tight-butted at joints and before joint plates are applied joint plates under head and base of rail are to be thoroughly brushed with wire brush to free contact surfaces from rust or scale. Head of rail or any piece of special trackwork not to be damaged in butting back rails. Cuts for closures to be sawn through head and web and closure joints to be tight. Uneven railheads at joints to be brought to uniform surface by grinding, care being taken not to grind more than is necessary to secure true running surface.

Joint bolts to be tightened with wrench not more than 2½ ft. long. Spikes to be driven straight and last few blows to be tapped lightly.

Tamping to surface to be done by hand or pneumatic tampers, tamping material being dampened. Line and surface to be within ⅛ in. of established line and grade. Under no circumstances shall track be concreted until line and grade are established, and in varying temperatures care shall be taken to keep track in perfect line before concreting.

Standard track drains to be installed at suitable and approved spaces.

Where 122-C.G. construction is specified, paving base shall be brought to line of top of base of rail and thoroughly tamped around and under rail, and smooth surface shall be secured. Where 122-C.A. construction is specified, paving base shall be brought to within 3¼ in. of top of rail. Concrete to be thoroughly tamped under and around rail and a rough surface secured for asphalt surface. Where 122-C.G. construction is specified, paving cushion of cement and sand shall be used and granite block grouted with cement grout. Before blocks are laid, stiff cement grout shall be plastered against web of rail, against which blocks are to lie.

Top of finished wearing surface to be at least ⅛ in. below top of rail.

Specification for Track Type 122-S.G. (Stone foundation, granite block paving).

Rails, ties, tie plates, spikes, tie rods, joints, and bolts as in preceding specification.

Excavation—Wearing surface to be removed and total excavation made to depth of 24 in. below finished grade of top of rail. Width of excavation to be 8 ft. 6 in. for a single track and 18 ft. 9 in. for double track.

Drainage—As in preceding specification.

Foundation—To consist of layer of run-of-crusher to 2 in. stone spread 9½ in. thick on subgrade, rolled to 15 in. below grade of top of rail, thus allowing about 1 in. for tamping to surface.

Tamping Materials—As cushion in preceding specification.

Paving Base and **General**—As in preceding specification, except that where 122-S.G. construction is specified, paving base shall be brought to line of top of base of rail and thoroughly tamped around and under rail, and a smooth surface secured. Paving cushion of cement and sand shall be used and granite block grouted with cement grout. Before blocks are laid a stiff cement grout shall be plastered against web of rail against which blocks are to lie. Top of finished wearing surface shall be at least ⅛ in. below top of rail.

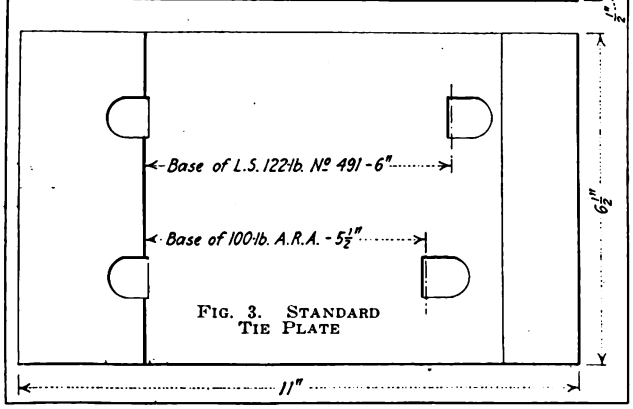

FIG. 3. STANDARD TIE PLATE

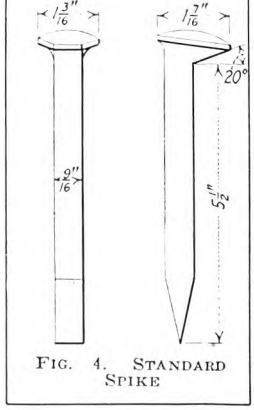

FIG. 4. STANDARD SPIKE

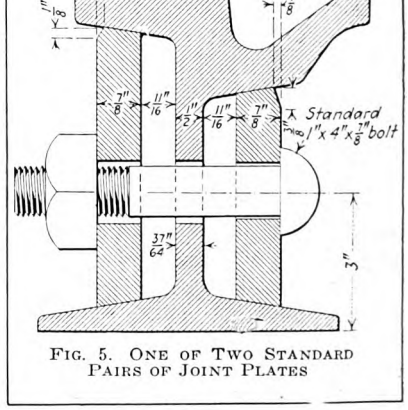

FIG. 5. ONE OF TWO STANDARD PAIRS OF JOINT PLATES

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the track in streets, while 108-lb. grooved girder and 70-lb. A. S. C. E. T-rail sections were adopted for the carhouses and storage yards.

Three standard cross-sections were provided to cover the different conditions of foundation and paving. These cross-sections are reproduced, together with a digest of the specifications on page 554. They will be seen to follow A. E. R. A. standards in general.

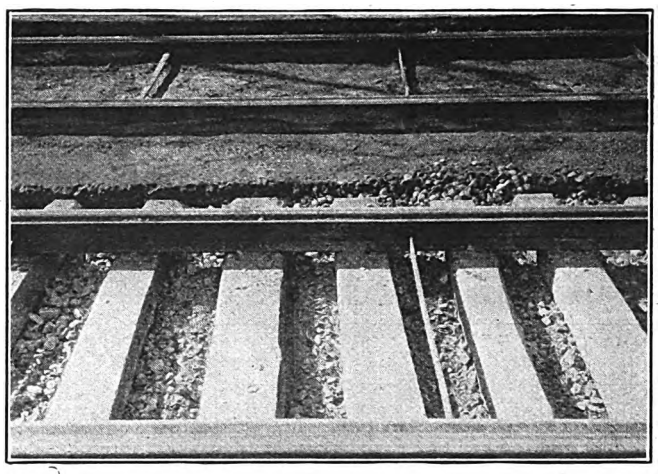
For the concrete foundation, types 122-C.A. and 122-C.G. track, an aggregate of trap rock was specified so as to give a tough and durable concrete. It is expected that this foundation will be permanent. The concrete which is placed between the ties has a softer aggregate. It is separated from the base slab by a cushion of dust and fine stone.

Specifications for special trackwork, rails, etc., have not been reproduced. All of these were fully standardized, however.

Three types of special trackwork were provided: Type A, solid manganese switches, mates and crosses, with class No. 1 rail.* Type B, solid manganese switches and mates with frogs and crossings of steel castings, having manganese inserts at the points receiving greatest wear, with class No. 1 rail. Type C, solid manganese switches with mates, frogs and crossings of rolled rail arms bound together with cast-iron or cast-steel bodies, having manganese inserts placed at the points receiving greatest wear, with class No. 1 rail. Provision is made in a complicated layout where type B or type C construction is called for, and it is found that the length of arms on any individual piece is insufficient to permit the proper use of manganese inserts with plate clearance of at least 9 in. from the end of the arm, for the construction of the whole or part of the piece of solid manganese steel.

Under the specifications for cast-steel construction with manganese inserts and iron or steel-bound construction with manganese inserts, it is interesting to note that provision is made for construction in conformity with the latest recommended specifications of the A. E. R. A. for each class of construction, except that the general conditions as given in the commission's specifications shall apply as far as possible under the conditions governing the individual layout.

*Rail has this chemical composition: Carbon, 0.60 to 0.75 per cent; manganese, 0.60 to 0.90 per cent; silicon, not more than 0.20 per cent; phosphorus, not more than 0.04 per cent.



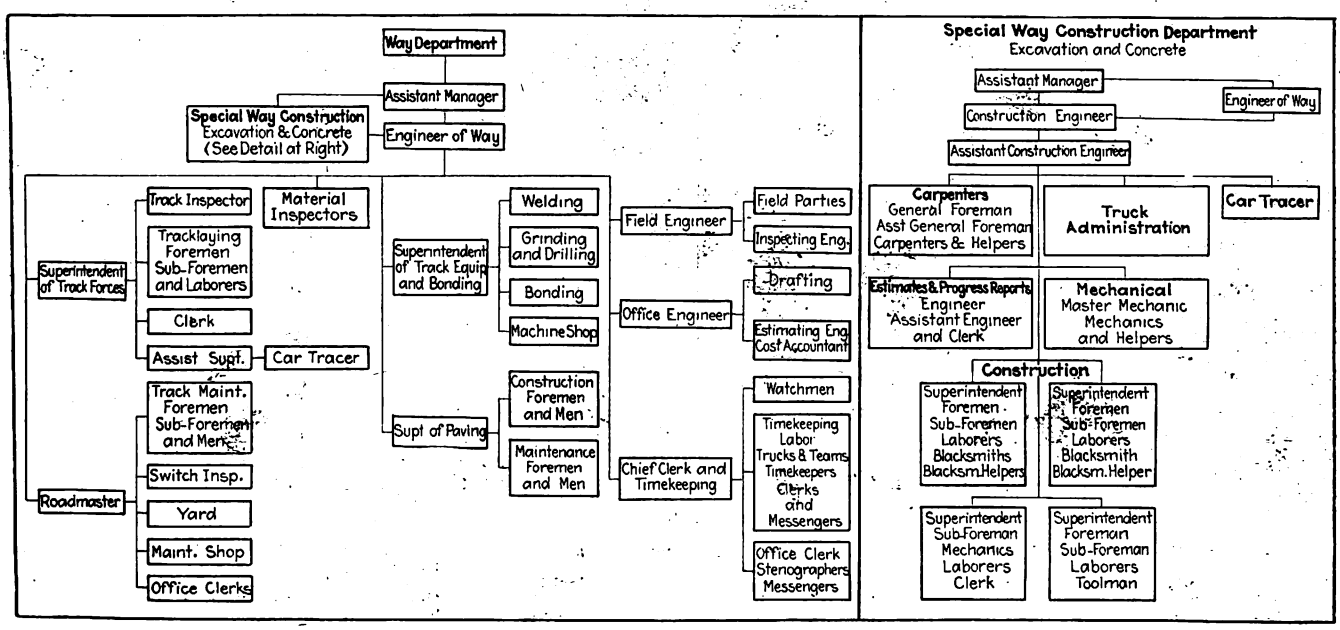
"CLOSE-UP" OF DOUBLE-TRACK CONSTRUCTION WITH CRUSHED STONE FOUNDATION. ABOVE, CONCRETE PAVING BASE IN PLACE; BELOW, TIES TAMPED READY FOR POURING OF PAVING BASE

As to ties, the commission's specifications permit the use of white oak, cedar, jack pine, tamarack, hemlock and long-leaf 90-per-cent-heart Southern yellow pine. Pole ties are acceptable excepting those made from oak or from Southern long-leaf yellow pine. For special trackwork ties, the only woods acceptable are white oak, rock elm, chestnut, hemlock and long-leaf 90-per-cent-heart Southern yellow pine.

SCHEDULING WAS AN IMPORTANT ELEMENT IN THIS WORK

With so many jobs to be done simultaneously, and such large forces to be handled, unusual care had to be given by Mr. Spencer and his associates to the scheduling of the numerous operations.

As far as the general trackwork was concerned, it could be considered best in connection with the several operations involved as follows: (a) Wearing surface removed. (b) Concrete broken. (c) Grading done. (d) Slab poured (or crushed stone foundation placed and rolled). (e) Rails laid. (f) Track lined and surfaced. (g) Joints completed. (h) Base poured. (i) Wearing surface laid.



ORGANIZATION OF WAY DEPARTMENT, TORONTO TRANSPORTATION COMMISSION

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By means of a progress chart form, such as that reproduced on page 558, it was possible to estimate about how fast the work could be done. As the work was actually done, it was represented, day by day, on the progress chart by means of shaded rectangles like those reproduced.

While the special trackwork jobs were more difficult to estimate, every effort was made to schedule this work so that the maximum number could be completed before heavy frost set in.

How the Trackwork Was Organized

Mention has already been made of the general personnel of the special way department organization. Now, as to the way in which the actual construction was carried out. A number of track gangs were provided, each with its special duty. These gangs and their functions were as follows: Gang A does all excavating and concrete work, and all delivery of material except rails. Gang B does track laying, tamping and surfacing, and when necessary blocks up the track for traffic. Gang C does all paving and arranges track drains and connections with the city sewers. Gang D delivers tangent rails and makes changes and repairs in special trackwork. Gang E delivers blocking as needed, having for this service a Ford 1-ton delivery wagon.

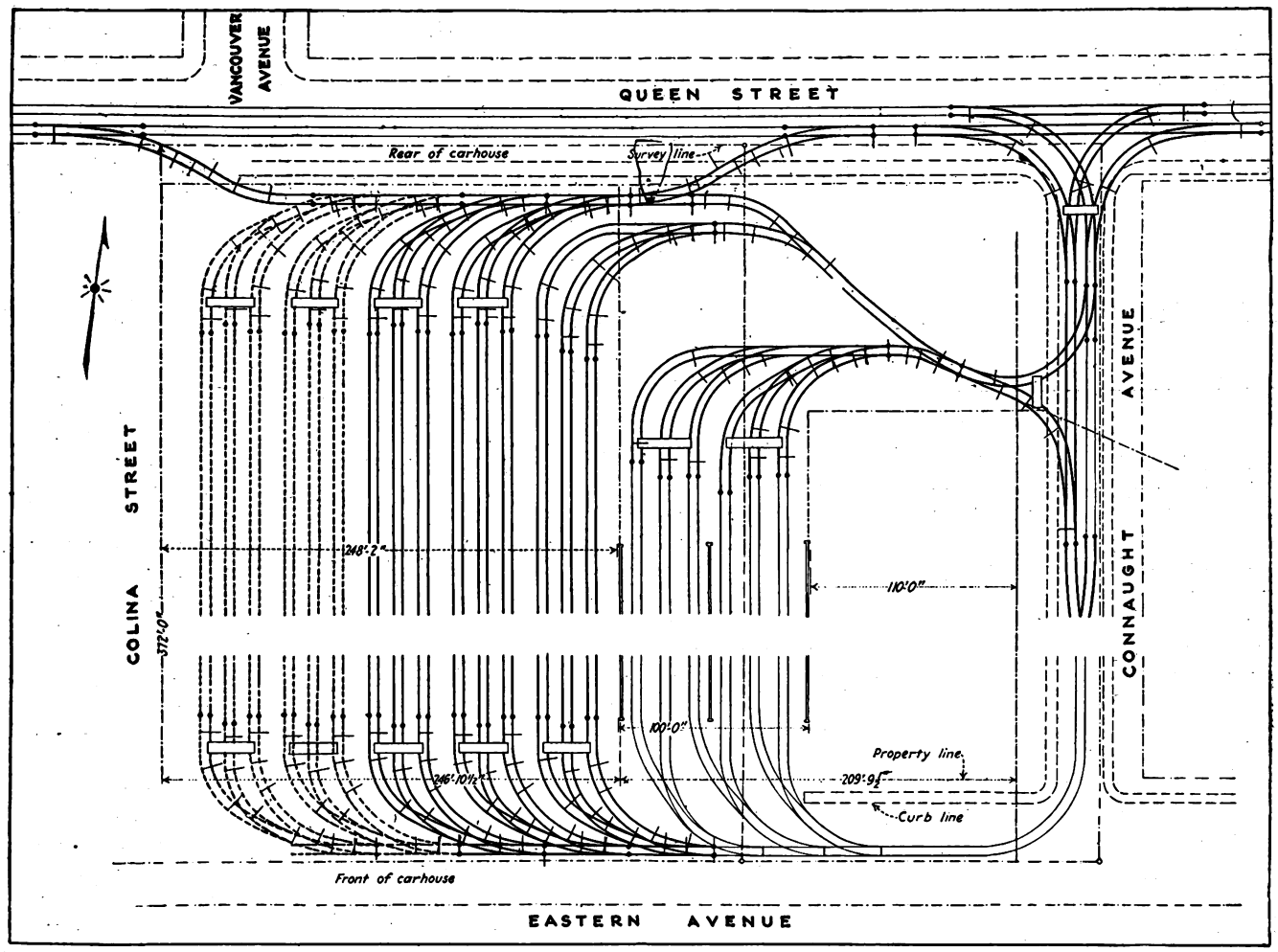
The field engineering work is divided as follows: One engineer is responsible for lines and grades; a second supervises bonding, welding and grinding; a third attends to material requisitions, time keeping and watchman service; a fourth is responsible for the sufficiency of supplies of materials and for their delivery as required by the track forces.

Mechanical Devices Provided to Save Labor

The way department could not have performed the difficult task assigned to it without liberal provision of mechanical devices for performing every possible operation. These machines can best be considered in connection with the functions they were called upon to perform. The series of functions may be followed from the materials yards to the finished track.

In the materials yards, of which there were several, locomotive cranes with 50-ft. booms and clamshell buckets were provided to shunt and unload steam railroad cars loaded with stone, gravel and sand. Brownhoist derricks were also provided for handling rails and special trackwork, both in the yards and on the work. Liberal numbers were also provided of Barber-Greene loading machines for lifting sand, crushed stone, stone dust, etc., from the piles and delivering them into a measuring hopper or chute for loading into trucks.

For transporting materials from the yards to the job, work cars and various forms of truck are employed. The latter are in most cases hired from local trucking concerns.



General Track Layout at the Russell Carhouse

Concrete Material Mixed at Yards

In order to simplify the work at the concrete mixers, concrete materials are proportioned at the yards by means of the loading machines. The materials are

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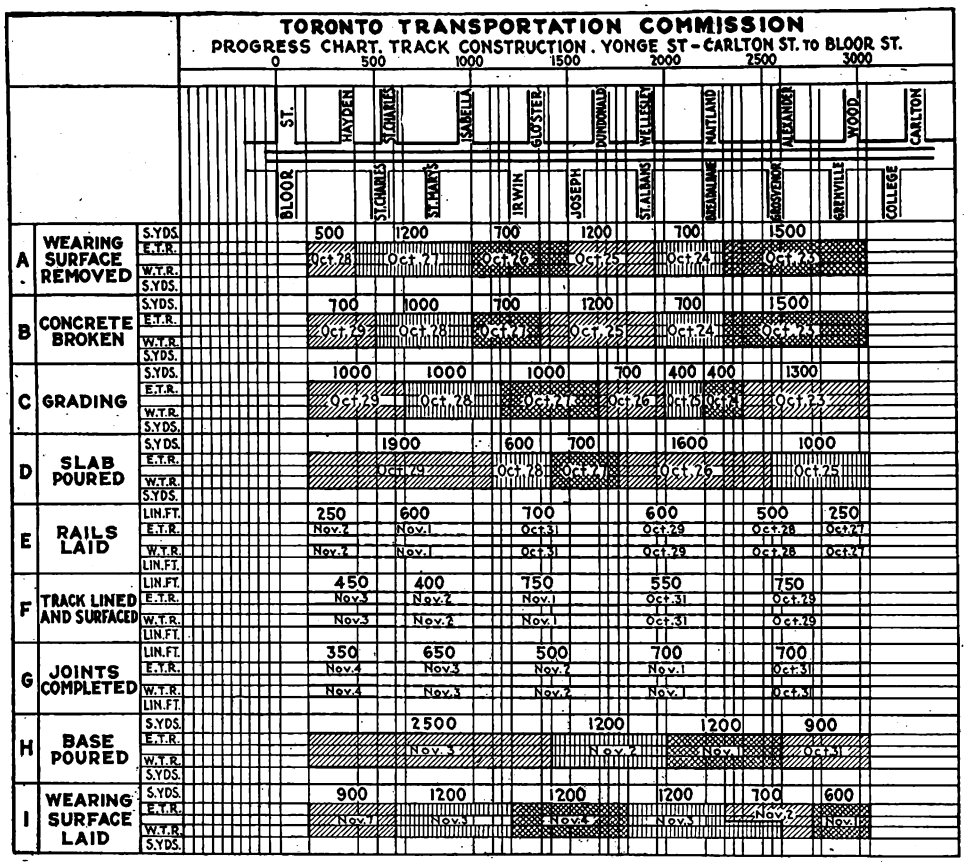
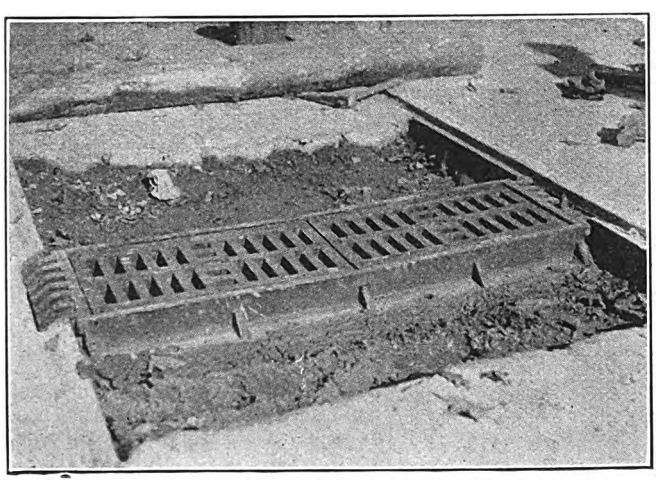


TYPICAL TRACK RECONSTRUCTION PROGRESS CHART

handled in batch boxes of 33 cu.ft. capacity, two of which form a load for one motor truck. The batch boxes are bottom opening, so that the materials can be dropped directly into the concrete mixer hopper by means of a boom on the mixer. The bags of cement are laid on the batch boxes at the yards, and are emptied into the boxes while the batch-box trucks are in transit between the yards and the work. On the street, the first task is to loosen and remove the paving. Three methods are used for breaking track and pavement foundations: (1) By means of a drop-hammer in leads on the boom of a steam shovel; (2) by means of a steam hammer mounted in leads on the boom of a steam shovel, and (3) by pneumatic tools.

After the material encasing the track has been loosened, the track is jacked up and the rails, when "scrap," are cut off by means of an acetylene torch so that the track can be removed in sections by crane and truck to nearby yards for storage and salvaging. In many cases openings were made in the paving, jacks were introduced and the whole track structure was jacked up off the ties. After the paving blocks had been removed, the shovel was able to handle all excavation without the use of the breaker.



TRACK DRAIN IN POSITION READY FOR PAVING

The next step in construction is the excavation of the roadbed, which is done by means of $\frac{3}{4}$-yd. steam shovels. Three of these are employed, two of which are mounted on wheels, and the other on caterpillar treads.

After the shovels have completed their work on the trench, the latter is trimmed to line and grade by hand if a concrete base is to be used, and is ready for the concrete sub-base. The concrete is mixed and poured by means of Foote mixers in 21-cu.ft. batches. These mixers are mounted on caterpillar treads and are steam driven. As previously explained, the materials are transported dry, in batch boxes, from the yards. The cushion is then spread on the sub-base, the ties are laid, the rails strung and spiked, etc.

The 122-S-G-type track does not require careful trimming of the trench and the crushed rock is spread and compacted to a depth of 9 in. in two rollings.

The joints are made by first tightening up the plates with four bolts. They are then seam-welded top and bottom by the use of the metallic or carbon arc. These plates are chamfered to provide suitable grooves for the welding materials. After the joints are welded, two of the bolts are removed. The joints not welded are electrically bonded by means of No. 0000 bonds with metal terminals.

The work in Toronto was considerably complicated by the fact that so much of it had to be done under traffic. Of course, as the commission had control of most of the trackage in the city, it was possible to divert much of the traffic to adjacent lines when a stretch of street was needed for track rehabilitation. Temporary track was laid in some cases. To secure sufficient time for the hardening of the concrete base, in some cases the following expedient was adopted:

After the trench had been finished, the rails were strung with temporary joints on alternate ties, the latter being blocked up to approximate position. On the top of each pile of blocking a wedge was inserted under the tie, partly to permit adjustment and partly to provide for convenient knocking out of the top blocking when desired. The concrete base was then poured, and traffic over the track was permitted while the base was setting. The alternate ties were then tamped up on the cushion and the blocking was knocked loose, leaving the track resting on the ties. The cushion material was then distributed, the remaining ties placed in position and under-tamped; the paving base poured, etc.

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Safety Committee Reduces Accidents

With the Assistance of Safety Organization Little Rock Reduces Accident Charges in 1921 to Nearly Half of 1 per Cent of the Gross

THE efficacy of safety work when in charge of a committee devoting its time to that question is strikingly shown on the property of the Little Rock Railway & Electric Company. This system is a combined electric railway and lighting property, but this does not account for the low figure quoted above as that is the figure for the railway department. Exactly, the railway department figure was 0.56 per cent. This figure represents amounts paid out for claims and does not include the expenses of the claims department, which are about 1.1 per cent of gross receipts. For both departments the figure was slightly higher than this, owing to two accidents in the power station and one on the lighting distribution system. If it had not been for these accidents the damages account would have been less than one-half of 1 per cent of the gross.

The chairman of the safety committee is Elmer Schoggen, assistant attorney in charge of claims, and the committee is made up of one employee from the distribution department, one from the power station, one motorman, one conductor and one representative from the shops. Mr. Schoggen is a practical transportation man, having spent three years on the platform himself. This committee meets every two weeks to consider suggestions, visit the various departments where accidents might occur, and discuss methods of preventing accidents. The total claims force consists of Mr. Schoggen, Mr. Rowland, the claim agent, himself a former conductor; the company's physician and one motorman who is available for special claims inspection work. Some of the recommendations made by the committee during 1921 follow:

A better method of carrying pikes on car-construction trucks.

Covering holes in the boiler room floor.

A rule forbidding a passenger from standing in the corner of the car platform near the controller.

Improving the condition of the wash rooms.

A rule forbidding the throwing of clothing on machinery and other places in the shops.

Improving the operation of sanders on the cars.

Providing guards on machinery in the shops.

Placing new rubber mats in front of the switchboards and using the old ones in front of the cut-off saw and jointer in the car shops.

A rule providing that the conductor can cancel his two-bell signal to start by another bell if he has to open the rear door again.

A protest to the health officer to stop passengers spitting in or on cars.

Stopping boys from hanging onto the backs of cars. The method followed in this case was to notify their parents of the dangerous practice.

The installation on each car of a box for waste for the motorman to keep windows clean in rainy weather.

The installation of lights at the end of car lines.

Instructions to linemen to make special efforts not to hold up cars because the cars delayed may incur accidents while speeding up to make up time.

The figures secured in 1921 are the lowest attained by the company and are attributed entirely to the work of the committee. Three or four years ago it was the custom of the company to set up an accident reserve of 3 per cent of the gross. That this has been a progressive improvement is shown by these figures: In 1919 claims paid averaged $8.54 per 1,000 car-miles; in 1920, $4.58 per 1,000 car-miles; in 1921, about half the latter figure.

Benefits from this attention to safety come not only directly but indirectly. Among the latter advantages is undoubtedly the knowledge by both employees and public generally that the company is making every effort to make its service as safe as possible. The result is that suits are less frequent than they were and can usually be settled out of court, if the company is liable. In fact, there has not been a judgment in court against the company in a damage suit for two and one-half years. The last was a judgment of $100 in a $5,000 suit.

In fact, one of the strong features of the Little Rock safety work is the policy of settling so far as possible any, or any likely liability. This has been the policy for so long and the record in the past is such that all jurors in that section of the country go into the jury box with the idea that there is not much wrong on the company's part or the case would not be in court.

Then, too, the co-operation of the company's physician in the claims work is very important. If any one is hurt, even though there is no apparent liability whatever, the company's policy is to send the physician, who takes an immediate statement. The personality of the physician has proved to be such that even though the injured person is hostile, he is usually made a friend.

In judging results of claims work, it is usually important to have a few statistics. In this regard, the average speed of the cars in Little Rock in 1919 was 8.36 car-miles per hour; in 1920, 8.46, and in 1921 about the same as in 1920. The car-miles operated are slightly in excess of 2,500,000; the passengers carried, something over 22,000,000. The population of Little Rock proper is about 65,000. In 1920, 1,723 accidents of all kinds were reported.

Japanese Railways Report

ALTHOUGH the mileage of government-owned electrically-equipped track and the number of electric locomotives and tramway cars owned and operated by the Japanese government are not large, the latest report of the Railway Administration shows that the government is awake to the possibilities of electrical operation.

Out of 2,933 locomotives owned on March 31, 1919, twelve were electric. There were 190 electric tramway cars, an increase for the year of thirty-eight. Improvement work for the preceding year included the completion of the overhead tracks for the electrified line in Yokohama.

Electric service on the Tokyo suburban lines was improved by reduction of headway of trains from fifteen to twelve minutes on the Yamati line and the Tokyo-Yokohama electric section. Time-table improvements were also made on the Nakano-Kichijoji section of the Central line just electrified, part of the electric service being now furnished as far as Kichijoji. The Tokyo-Manseibashi electric section was opened to traffic and electric trains were operated from Nakano to Uyeno through the Tokyo station. Some trains were operated from Tokyo to Nakana, and from Tokyo to Kichijoji.

The fifteen power stations operated by the government produced 35,775,000 kw.-hr. of energy during the year and the output of the twenty-five substations was 31,495,000 kw.-hr. The average cost of the former was 0.0333 yen (1.67 cents at par of exchange) per kilowatt-hour and of the latter 0.0183 yen (0.9 cent) additional.

The government's electric cars made 7,892,000 miles at an energy expenditure of 2.41 kw.-hr. per car-mile

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(cost 3.7 cents); while the electric locomotives made 153,200 miles and consumed 19.63 kw.-hr. per mile, hauling an average of about seven cars.

The government conducts a Central Institute for training railwaymen, with courses in railway business, technology, electricity and English. A total of 942 men have graduated since the opening of the institute in 1909, divided thus: 526, 219, 63 and 134 respectively in the sections listed. There are also five district institutes in which the instruction is largely of a practical nature. In one year there were more than 2,500 graduates from these.

The report from which the above information is taken also contains facts regarding the privately-owned (including municipal) tramways. The number of passengers carried was 983,068,275 and 2,435,847 tons of freight was moved. The earnings were 49,136,431 yen (about $24,500,000 at par of exchange). The total mileage given above was made up of 720 miles of electric; 273 of steam; 33 of gas; 195 of horse, and 49 of man-power (rikisha) railway. The numbers and lengths of lines in these average divisions were: Electric, 69—10.4 miles; steam, 29—9.4 miles; gas, 4—8 miles; horse, 34—5.7 miles; rikisha, 9—5.5 miles.

Letters to the Editors

Improving the Electric Railway Personnel

GEORGIA RAILWAY & POWER COMPANY
ATLANTA, GA., March 21, 1922.

To the Editors:

I feel very deeply on the subject of the selection of employees, as outlined in an editorial in your March 4 issue. There is, to my mind, no question connected with the industry which should command more attention from railway operators. Below are given, as briefly as possible, our ideas and aims in this connection.

First, we are of the opinion that the designations "conductor" and "motorman" are misnomers in so far as the public is concerned. Conductors and motormen are nothing more nor less than salesmen—sellers of service. They sell the only thing we have to sell, namely, street car rides. Upon the manner in which they sell these rides—the smooth operation of the car, the courteous and careful handling of passengers and the agreeable willingness to serve—upon these things depend the satisfaction we will render our customers. Upon them rests in large measure the good will we are going to receive from these same customers, constituting the public who cannot now, and never could, "be damned." We don't believe that the American public is so much concerned about one or two cents additional care fare as about quick, safe, courteous and comfortable car rides. And these "service salesmen" are the men who furnish such rides, or else they fall down on the job and furnish an unsatisfactory service. Therefore, since so much depends on the personnel of our trainmen, we believe that the highest type of men available for the wages paid should be employed for the positions of salesmen. To this end we have entirely reorganized our employment and instruction department and are working toward a higher goal in the matter of personnel.

Assuming that the applicant is of sufficiently reasonable intelligence for the position of salesman (and by process of strict examination and elimination we ascertain this before considering his application), we think it equally important that he be physically fit. This man, if employed, is going to do business with the rich and the poor, with smart people, foolish people, ignorant people and all sorts of cranks. He must deal with the good natured and ill natured. He meets them all daily, and has perhaps a wider assortment of customers than any other salesman in the world. In addition to this, the operation of his car through the busy, crowded thoroughfares of a city requires physical as well as mental alertness; the proper brain and muscle co-ordination to cause him to act, and act quickly in case of emergency. How many customers have been offended by some grouchy conductor, whose ill nature could be probably traced to poor eyesight and resulting headaches, or possibly to defective teeth? How many accidents have been caused by the defective eyesight of the motorman and his inability properly to judge distances, or possibly by a slightly defective hearing (which he has kept secret) and which caused him to miss his signal bells? And who knows but what that same customer who was offended by the grouchy conductor may sit on the jury in the damage suit resulting from the accident caused by the physically defective motorman? Many a conductor naturally of even temper and good judgment has developed a surly, crabbed disposition because he was physically ill and didn't know it. Many a motorman with a previous clear accident record has spoiled it by reason of his own physical ailment of which he was unaware.

We by no means put the physical above the mental qualifications of applicants, but under our system of selection, which insures a satisfactory mental fitness, we are giving particular attention to physical requirements. We are now finishing our first annual physical examination of every trainman in the service, an examination which extended to the division superintendents. The company pays the nominal fee charged by the doctor, and feels amply repaid from the results already obtained. The examination (the same as that used for applicants) is very rigid, including heart and lung tests, blood pressure examination and urinalysis. We have found some of our older employees suffering from high blood pressure and in immediate danger of paralysis. Such men have been laid off and required to take treatment in the way of diet, etc., and they are being paid sick benefits by our relief association, an organization organized and supported by employees themselves. Others have been found with bad teeth, responsible for and liable to cause serious physical ailments. To meet this, we have established a dentist at our transportation headquarters, and by reason of the large volume of work he is enabled to make comparatively low prices on cases handled among our men. The charges are deducted in reasonable monthly installments from the employees' wages. No single thing we have done recently has met with more favor among our trainmen than the introduction of "industrial dentistry" for their benefit, and for the benefit of their families.

As time passes there will no doubt be found men who are physically unable to perform the duties of either motorman or conductor. If such men have had sufficient length of service, and we are unable to place them elsewhere, we will retire them under our plan of annuities or pensions. Where they have not, we will use every possible means to get them into such physical condition that they can carry on their duties, or will endeavor by persuasion to have them enter some other field of work,

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depending on the merits in each case. In other words, we expect to build up the physical standard among our trainmen and weed out the misfits, bearing in mind, of course, that this last must be done with justice and discrimination. And in employing new men, it is our aim to select only such types as are physically, mentally and morally fit to represent us before the public as service salesmen.

In connection with the actual training of men, we are endeavoring to remove every trace of the taskmaster and substitute the feeling of helpful leadership. We believe we can make the man feel that the company is, after all, his best friend. We want him to know that we are just as anxious about his making a clean record as he is himself. By our follow-up methods we find men who have been with us for some little time, occasionally a long time, who have grown stale or indifferent in their work. Unless their offenses are viciously flagrant, we are bringing them back to school and trying by patient methods to "work the kinks out" and recharge them with a desire to be up and on their toes in an effort to render service—not just ordinary service, but good service—just as we should do if there were a dozen competing street railways here.

The idea, the spirit and the aim we have in mind seem to be rapidly permeating our entire body of men, and by the tactics which I have described we are getting splendid results.

In conclusion, I can only add that a motorman or a conductor is not an ordinary individual, in the sense so many have come to regard him. He is a salesman, who deals with everybody and who requires infinite tact, patience and judgment, if he is to protect his company and maintain its standards of service. And to the end that he may make a success of his work, he must have the natural requirements to begin with, he must have the right principles of duty instilled into him when he is new and in an impressionable state, and thereafter he must be encouraged when he gets a raw deal from his public (because he is going to get this anyway, at some time or other) and when things break badly for him he should have the satisfaction of knowing that his company is with him and for him. With this spirit of unity and co-operation and the proper training and guidance nothing but good results can be obtained.

F. L. BUTLER,
General Operating Manager.

Combating Jitneys by a Small Railway

DANBURY & BETHEL STREET RAILWAY
DANBURY, CONN., March 28, 1922.

To the Editors:

It may be of interest to your readers to know the effect of the elimination of jitney competition on a small street railway in the hands of a receiver. The Danbury & Bethel Street Railway is operating 13 miles of electric railway in the towns of Danbury and Bethel and 4 miles of motor bus lines. The company has been in the hands of a receiver since Nov. 1, 1917. The territory which is served by this railway has a population of about 27,000.

Jitney competition began in the spring of 1918 and continued until about May 1, 1921. The Connecticut Legislature of 1921, carrying out the recommendation of Governor Lake in his inaugural message, passed an act declaring jitneys "common carriers," placing them under the jurisdiction of the Public Utilities Commission and requiring a certificate of "convenience and necessity" before a jitney could be allowed to operate, operation being over fixed routes under regular schedules approved by the commission. This act took effect on July 15, 1921, but several months before it went into effect the jitneys competing with our company ceased to operate, due largely to a routing of the jitneys under a local ordinance passed after announcement was made that street railway service would be suspended unless the jitneys were curbed. Since the law has gone into effect no application has been made by any jitney seeking to compete with our company for a certificate of "convenience and necessity." The same session of the Legislature authorized the street railways of the state to operate motor vehicles. We have had no jitney competition since May 1, 1921, and since July 1, 1921, we have been operating two lines of motor buses as feeders to our electric railway lines.

The following monthly comparative statement of gross passenger receipts for 1920 and 1921 and two months of 1922 shows just what the elimination of jitney competition has meant in dollars and cents to our little company:

	1920	1921	1922
January	$11,644.02	$ 9,871.02	$14,154.05
February	9,740.27	9,000.74	12,675.71
March	8,767.72	11,284.99	
April	9,731.62	10,830.83	
May	10,052.43	11,830.83	
June	10,711.82	13,484.27	
July	13,597.01	16,543.15	
August	13,478.62	16,407.39	
September	10,895.52	14,473.68	
October	12,413.97	18,077.33	
November	8,546.52	12,567.36	
December	10,117.50	14,367.15	
	$129,697.28	$157,971.29	

During the first six months of 1920 we had a 7-cent fare within the limits of Danbury or Bethel, and a 10-cent fare for a through ride. Since July, 1920, we have had a flat 10-cent fare on all lines with an 8-cent ticket rate (metal tokens now being sold twenty-five for $2). Notwithstanding the increase of fare, the first four months of 1921 showed an increase over the same months of 1920 of only $1,103.69, or an average monthly gain of $275.92. The last eight months of 1921 (after the elimination of jitney competition) show a gain of $27,937.77 over the same months for 1920, notwithstanding that during six of these months the same rate of fare prevailed. This corresponds to an average monthly gain of $3,492.22. January and February, 1922, show a gain over January and February, 1921, when we had jitney competition, but with the same rate of fare, of $7,958, a monthly average of nearly $4,000.

In 1920 we had an operating deficit of $18,962.19, while in 1921 we had an operating revenue of $17,632.39. This difference was due, of course, not alone to the absence of jitney competition but also to a decrease in operating expenses.

We are now using safety cars of the Birney type exclusively, and trying to give the maximum of service as the best preventive for any jitney in the future securing a certificate of "convenience and necessity." With the elimination of unfair jitney competition, the use of safety cars and with supplementary motor bus service on a limited scale, I believe there is a future for the street railway in our smaller cities.

J. MOSS IVES,
Receiver.

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Some Features of Safety Car Design*

Author Says Good Word for Rebuilt Car—Approves Design Described by Mr. Adams—Favors Double-Truck Safety Type as to Riding Qualities and Maintenance

BY HENRY CORDELL
Master Mechanic Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

SEVERAL operators have designed and built cars which, in their opinion are the ideal. Some of us have remodeled old cars and feel that they are the last word in safety car construction, from a rebuilding standpoint. The Chicago, North Shore & Milwaukee Railroad has rebuilt some of its two-man cars and contemplates rebuilding additional cars that are suitable for one-man operation. I am of the opinion that too little thought is given to rebuilding of the cars one has, when they are adaptable to one-man operation. I believe we should ignore the amount of extra weight if the bodies are in fair condition and the electrical equipment consists of later types of controllers and motors.

There is one thing certain in my mind—that a car built under the old idea, where a little too much material was used rather than just enough theoretically to stand the service, has proved to be worthy. The average old car can be rebuilt for $1,500 or $2,000—a saving of from $4,000 to $5,000 as compared to the cost of a new safety car. Why not get the use out of it by spending a few dollars? If the old car is sold, the receipts would not go far toward the purchase of a new car.

With modern motors the power consumption is not such a great drawback, considering passengers handled on a larger car. We find on a safety car weighing around 17,000 lb. a current consumption of under 1.3 kw.-hr. per car-mile as against 2.3 kw.-hr. for a car weighing 34,000 lb. However, we can carry on this car forty seated passengers as against thirty-two on the safety car and stand a corresponding larger number, giving a better ride due to double-truck construction.

Maintenance on a safety car is of an unknown quantity as yet with a good many companies. Of course, the cost is very low the first year or so, but will it remain at this low figure of say 2 cents per car-mile after a few years? We have all heard the expression that we can afford to retire a safety car after five or six years and buy a new one. Few companies will do this, and then the mechanical departments will have some grief explaining why the maintenance costs are running up.

In order to obtain the lightest type of one-man car we went to single-truck construction. I personally feel we should have been better off if we had retained the double trucks. First of all, the riding qualities of a double-truck car are not obtained. Second, a great deal of flange wear occurs—more than is proportional as compared to a double-truck car. For example, the wheels under a double-truck car weighing 52,000 lb. used in city service will give a mileage of 298,000, whereas the wheels under a 17,000-lb. single-truck safety car give only 80,000 to 85,000 miles. The flanges wear rapidly because nearly all track layouts built during the last twenty years have been constructed to suit double-truck cars with a wheelbase of from 4 ft. 6 in. to 6 ft. 6 in. We can't expect a car with an 8 ft. or 9 ft. wheelbase to take the same curves and special work, at a rate of speed even higher than that of a double-truck car, without showing the effects.

I note a movement afoot for increasing the weight of safety car parts that experience has taught us were too weak. We have overlooked the fact that we have heavy overloads at times, amounting to as much as two-thirds of the light weight of a safety car weighing sixteen or seventeen thousand pounds. We know this condition cannot but produce stresses which break the backbone, so to speak, of the car and cause unnecessary repairs.

The car built by the Chicago Surface Lines described in Mr. Adams' paper† is in line with my idea of a one-man car. It will be noticed that there is only a difference of 112 lb. per seated passenger in dead weight between the single-truck car and the double-truck car mentioned in the paper. This is a good figure when you consider the difference of 7 ft. 11½ in. in length and 6 in. in width, not taking into consideration the additional weight of the extra truck and motors.

The aluminum stanchions and railings make a very good installation and are easy to keep clean, require no paint, and even with a higher initial cost I am inclined to believe it would be cheaper in the long run.

I would be very glad to know final results of the aluminum pipe installation on the air-brake equipment. I have some doubt of it lasting in operation, having a tensile strength of only about one-half that of wrought-iron pipe. I believe that breaking will occur due to the vibration.

The handling of passengers in a safe, quick and economical way depends on door width, height of step, method of fare collection and the operator.

Quick handling of passengers can be accomplished safely with double doors with an opening of 23½ in. each, divided by a stanchion and railing through the center of the platform, dividing boarding and alighting passengers. With selective control from the operator's valve, arranged so that either door or both doors, if so desired, can be opened, both flexibility and safety are provided.

There is no reason why one-man car operation with full safety control should not be used on interurban properties, particularly on branch lines where the traffic is not very heavy. The size of the car to which safety control may be applied is entirely immaterial, and it would be just as safe to operate with one man a car weighing 75,000 or 100,000 lb. as one weighing 16,000 lb.

*Abstract of discussion of paper by H. H. Adams at meeting of Illinois Electric Railways Association, Chicago, March 15-16, 1922.

†See issue of this paper for March 25, page 520.

Midwinter Convocation of Engineers in Chicago

On March 21 and 22, under the joint auspices of the Western Society of Engineers and the Chicago sections of eight national engineering societies, a general convocation of engineers was held to inform the engineers of the community about the engineering problems of Chicago now pressing for solution and the part they should take in carrying them through. In the first three sessions held on March 21 and the morning of March 22, gas and electric utilities problems were the principal questions under discussion. In the afternoon session E. J. Noonan, chief engineer of the Chicago Terminal Commission, spoke on the "Railroad Transportation in Chicago," discussing in particular the location and construction of the new terminals which are planned to improve the railroad terminal situation in Chicago. Bion J. Arnold, following on the same general topic, recommended that the steam railroads co-operate to the extent of providing three through routes through the city on much the same system that is followed by the surface and elevated lines in routing cars through the loop and not merely to it as was formerly the case. A paper by Harry L. Brown, Western editor ELECTRIC RAILWAY JOURNAL and BUS TRANSPORTATION, on "The Possibilities of Developing Chicago's Transportation Facilities," was read in his absence by W. W. DeBerard. This paper is printed in abstract elsewhere in this issue.

Institute of Transport to Celebrate Historical Events

The Institute of Transport of London expects to arrange suitable celebrations of the centenary of the opening of the Stockton & Darlington Railway in 1825 and of the locomotive trials at Rainhill in 1829. It was at these latter trials that the famous engine "Rocket," built by George Stephenson, established the supremacy of steam engines over the then known method of steam transport, namely, stationary steam engines.

It is expected that these celebrations will be held in connection with the annual congresses of the Institute in the years in question.

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Wisconsin Men Hold Liberal Views on Their Competitive Problems

Joint Convention of Electrical and Gas Associations Held in Milwaukee—The Two Associations Combined Into the Wisconsin Utilities Association—Railway Men Discuss Bus Competition and Selling Transportation and Make Inspection Trip Through Milwaukee Company Shops

JOINT sessions of the Wisconsin Gas Association and the Wisconsin Electrical Association in connection with their annual meeting in Milwaukee extended over the three days of March 22, 23 and 24. The principal business disposed of by the convention was ratification of the action of the two executive committees in uniting the electric light, railway and gas utilities of the state into one association named the Wisconsin Utilities Association. The electric railway and electric light associations combined several years ago. Of the new organization J. P. Pulliam was elected first president, he having served as president of both the gas and electrical associations during the past year. Other officers elected were: Ewald Haas, Milwaukee, vice-president; G. C. Neff, Madison, treasurer, and J. N. Cadby, Madison, executive secretary. C. R. Phenicie, Green Bay, was elected chairman of the electrical section; Bruno Rahn, Milwaukee, chairman of the gas section, and B. W. Arnold, Oshkosh, chairman of the railway section, with Dudley Montgomery, Madison, as assistant.

In his president's address, Mr. Pulliam said that more than $50,000,000 will be spent in Wisconsin by the various utility companies during the course of this year in new construction work, extensions and improvements. A careful study given the business situation by the various utility companies has given rise to a conservative belief that from now on a gradual upturn of all industry may be expected. Since utility companies blazed the way for industrial growth, the utilities are leading the way with their expansion programs. That shows in terms of money that they have confidence in the general industrial and business outlook. Those cities in which they have been permitted to earn their just revenues will benefit from this program sooner than those wherein the rates have been held so low as to make postponement of improvements imperative because of inability to finance new work.

The public and the newspapers are beginning to investigate and discuss the situation of the utilities and their problems more thoroughly, and this, together with the liberal response to security offerings, gives our business a brighter outlook. Mr. Pulliam said that the recent sleet and snow storms which so seriously interfered with utility services and caused great damage of property generally may have their compensation in bringing forcibly to the attention of the public and the regulatory bodies the importance of the industry and the need of permitting utilities to earn sufficient return to be able to accumulate reserve funds to meet such emergencies. The public in those cities where utility services were interrupted are loud in their praise of the heroic work done by the utilities to restore service. Many of them have written letters to the different companies telling managers they never realized before how dependent they were upon the utilities for their daily necessities, comfort and conveniences.

Railway Men Discuss Bus Competition

W. G. Brooks, Westinghouse Electric & Manufacturing Company, served as chairman of the informal meeting of electric railway men on the afternoon of March 22, at which particular interest in the problems connected with motor bus competition was manifested. Charles E. Warwick, Green Bay, Wis., told of the passing of an ordinance in that city requiring a license fee of $100 per year and limiting operation of buses to streets other than those occupied by car lines. The legality of this ordinance, however, had been challenged by one of the bus operators and he had succeeded in securing an injunction which prevented the city from enforcing the ordinance. The city now is planning to put the matter up to a referendum vote unless the injunction is dissolved.

Mr. Warwick said he thought the people in his community were in favor of the street railway company because it had not made the bus competition a personal matter or openly attacked it, and hence there had been no disposition aroused to help the under dog. He said he considered that high class street car service was the best way to deal with jitney competition.

F. W. Walker, general manager Milwaukee Northern Railway, expressed the thought that motor bus competition should be considered in a broad-minded way. He pointed out that the electric interurban lines had entered the transportation field after the steam roads and had justified their position by developing a new kind of service. The buses are now doing the same thing and they have a right to operate, for they represent an advance in the art of transportation. The electric railways, however, came into existence by assuming all of the obligations and regulations to which the steam roads were subject, but this is not true of the buses. Under present operating conditions they are subsidized just as much as the steam railways were when the government gave them land grants. They practically escape all except personal taxes and have the use of the highways free. Furthermore, they are not being assessed at anywhere near their real value as personal property. For example, a truck valued at $5,000 was subject to a tax of only $153, total.

These matters are being brought to the attention of tax authorities. Buses and trucks should be charged so much per mile, based on capacity. Mr. Walker gave it as his opinion that the charge for buses should be ½ cent per mile up to a capacity of ten passengers, ¾ cent per mile for a capacity of ten to twenty passengers and 1 cent per mile for a capacity of over twenty passengers. They should be required to file their schedule and report the number of trips and pay the corresponding road charge at the end of each month. Mr. Walker pointed out that while the amounts he had suggested might not be right, the principle of a charge for the use of the road on a capacity basis was. With such an arrangement in force, a bus would be carrying its just part of the public burden, and on this basis he maintained that if a motor bus operator can make a profit he should be allowed to continue in operation wherever there is a demand for bus service without regard to competition.

Speaking of the effect of truck competition on the business handled by the Milwaukee Northern Railway, Mr. Walker said that on short-haul business, up to 25 miles, the freight business of the company had stopped increasing, but the long-haul business is continuing to grow. He considered that the way to meet this competition was through frequent service. He is sending the freight forward on an hourly basis and said that this is bringing business to the company.

Mr. Walker laid great emphasis upon the view that it is wrong to consider that buses should not be permitted to operate in territory already served by an electric railway. Such a theory is not sound. If the buses can operate in territory already served and pay their proper part of the public burden, then if the electric line cannot continue in business in the face of this competition it is obsolete and ought to go out of business.

B. W. Arnold, Oshkosh, expressed the view that there is little to fear from jitney competition in city service, as it has been pretty well established that the jitneys cannot live. The competitive interurban bus, however, is a different proposition and the amount of money it earns is dependent upon how much business the electric line permits the bus to take away from it. He told of an experience with one bus line which was in competition with the electric interurban line operated by the Eastern Wisconsin Electric Company.

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These buses had been operated out of the terminal cities just ahead of the interurban. They would pick up passengers at the interurban terminal and cut in ahead of the cars and delay them while the buses picked up passengers at points along the route. This practice led to a number of rather bad accidents and some encounters between trainmen and bus operators. This all culminated finally in an ordinance in Oshkosh which required that bus operators should have a permit. The City Council thereafter issued permits to non-competitive bus lines, but not to competitive lines. Mr. Arnold then succeeded in inducing the competitive bus operators to give service into territory otherwise unserved, offering full cooperation of the interurban line in that kind of operation. This plan was carried out and railway and bus are now working together rather than in competion.

R. M. Howard, LaCrosse, Wis., expressed the belief that the old law of the survival of the fittest is going to obtain. All the railways can ask is that the bus be maintained on an equal basis of responsibility and obligation to the public and then let the best man win. The buses must expect to pay some kind of a tax to cover the destruction of the roads over which they operate.

Mr. Munger, Milwaukee Electric Railway & Light Company, told how this company has placed buses in operation over the 18 miles of concrete road between Milwaukee and Waukesha paralleling the interurban line and in competition with independent buses. The fare charged on the company's buses is the same as that charged by the independents, which is lower than the railway rate. The railway's buses are operated on the same schedule as the independent buses and are now carrying about an equal number of passengers. In other words, if the company had not started the operation of buses, the independent bus lines presumably would now be carrying double the number of passengers which they actually are hauling.

Mr. Munger spoke about one bus line which the Milwaukee company has been operating for about four years, connecting Lake Geneva with the end of one of its interurban lines and giving a service not otherwise provided. This bus line has done very well and now the company is considering the installation of bus service beyond the ends of other interurban lines, first to bring further business to the interurban lines and second to keep independent operators out. One thought that has been in the minds of the railway company in going into the bus business is the probability that the authorities would more quickly attack the railway company to force a proper payment for the use of the road, and any restrictions that resulted would, of course, apply to competitors as well. The combination of independent buses and company buses both in competition with the interurban line to Waukesha has of course seriously affected the revenue of the railway.

N. C. Rasmussen, Wausau, Wis., said that the street railway system in Merrill, Wis., had been discontinued and three light buses substituted for the railway service. This change to buses was made as an alternative to rebuilding the railway system. Mr. Rasmussen concurred in the view of the Milwaukee company that the quickest way to bring the proper regulation of the buses is for the electric railways to get into the bus business.

B. W. Arnold expressed disagreement, saying that he thought the Milwaukee company was probably the only one in the state that could afford to fight buses with buses. He considered that the proper way to go about this was to give support to a bill before the Legislature which would bring about an equitable distribution of taxes over buses and other means of transportation. He contended, however, that the railway companies should get into the bus business to provide a feeder service for the railway lines now operating, but he thought that for the railway to get into competition with itself was just inviting the sheriff.

Selling Transportation

After a brief discussion of the field of the trolley bus, the discussion turned to the subject of ways and means to merchandise transportation. All who took part in this discussion emphasized the importance of good service. Mr. Burch, Waukegan (Ill.) city lines, illustrated the point by saying that in 1918, when large double-truck cars were operated on a twenty-five-minute interval, 2,000,000 passengers were carried. During 1921, as a result of an eight-minute headway during non-rush hours and a four-minute headway during rush hours, with service given with one-man safety cars, the number of passengers carried was 4,500,000. This increase was the more convincing because it had been made in spite of the closing down of the Great Lakes Naval Training Station, which had been a heavy contributor to traffic on the lines in 1918 and 1919. Jitney competition also disappeared with the improvement in service.

Dean Treat, Standard Oil Company, having for many years been a railway operator, spoke of the value of having an outsider criticise the service given by the company. He said that the man on the ground is so close to his problems that he does not realize the faults as readily as one from the outside. He spoke also of the great desirability of having superintendents and inspectors get out and ride the cars during the peak periods.

Ross W. Harris, Madison, Wis., spoke of the great improvement in public relations which comes from a public understanding of the service provided and emphasized the importance of this understanding as a merchandising asset. To illustrate the point, he reviewed the arrangement between company and city in Memphis, Tenn., and told how excellently the plan in effect there, which embodies a city representative and a company representative and himself as neutral, for working out all problems in connection with the local street railway service.

Mr. Warwick, Green Bay, Wis., said that the way to merchandise transportation is first for the company to sell the business to itself and then sell it to the employees, who act as the salesmen to serve the public. Keep the merchandise for sale constantly exposed to the convenience of the public so that the people can partake of it as often as they will and be pleased. This means a smooth roadbed, clean, comfortable cars and trainmen who are courteous and appear to be real, civilized fellows. Trainmen should be taught to study their patrons just as a clerk in a store studies his customers. The one-man car operator has many duties to perform, so that he needs to be highly trained not only as an efficient operator but also how to treat people who want to buy a little of the service. One of the principal duties of the superintendent of transportation now is to revamp the minds of the trainmen who have gone through this long period of inflation and get them to know that the people of America must now be treated with consideration and given full value for the money received. The Green Bay company is using a series of car cards placed on each bulkhead and changed twice a month on which the caption "Street Car Movies" appears and a short advertisement. The text of these advertisements is designed to have a good appeal to patrons and at the same time to get trainmen to conform to the same ideas.

Rates Should Include Demand Charge and Haulage Charge

F. W. Walker, in speaking of merchandising transportation, said that in addition to good service, the basis of charge should be so arranged as to take into account a demand charge and a haulage charge. He said it would be considered ridiculous to charge twice as much to haul freight 10 miles as to haul it 5 miles. The same sort of rates ought to apply to passenger haulage, for the long-haul passenger should not be required to stand the loss on the short-haul passenger. The long-haul passenger should be carried for less per mile. In working out these ideas and in trying to provide rates to meet the competition offered by the Chicago & Northwestern Railway, motor buses and private automobiles, the company has in effect the following rates: A 1,000-mile book at 2 cents a mile, a twenty-five-ride ticket at 2¼ cents per mile, a single ride ticket at 2¾ cents per mile, cash fare of 3 cents per mile, a monthly forty to sixty-two ride ticket with a rate graduated from 2 cents per mile for short haul to 1.65 cents per mile for the longest haul. In addition to these rates, the company also has a special clergymen's rate, special rates for conventions and round trip party rates. It makes a particular point of

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having the tickets of all denominations on sale at convenient locations. In addition to the railway offices, they are sold at stores and at various points in all cities along the route, in order to make it as convenient as possible for patrons to buy transportation, the theory being that the easier it is to buy transportation the more they will buy. A 100-mile book carrying the same rate as the single-ride ticket is also provided for the convenience of farmers who board cars at crossroads and cannot buy a ticket.

Similarly, the company has made its merchandise freight rates to favor the good customers. The farmer who ships milk every day gets a better rate than the intermittent shipper. A shipment in excess of 5,000 lb. to any one consignee carries a rate lower than that for smaller shipments. There is a special commodity rate for standard packages. There is a rate for merchandise having large bulk and small weight. Rates are also provided to include collection and delivery at any point, or for haulage only. There is a seasonal rate whereby the winter cost of handling shipments is put on the winter business. The summer rate applies during the nine months from March 15 to Dec. 15. Thus the farmer who ships his milk by interurban all the year around gets a 15-cent rate for nine months and a 45-cent rate for three months, averaging a cost for the year considerably under 30 cents. On the other hand, the farmer who ships by truck all summer and falls back on the interurban in the winter pays the high rate of 45 cents, or a figure corresponding to the cost of handling his business.

Mr. Walker said that one of the things that has been very effective in bringing business to the Milwaukee Northern Railway is the prompt settlement of claims. All claims are approached by the claim agent as though the shipper would not have put in the claim if he did not have one. The company assumes that the employees are at fault and are trying to cover up. If investigation finally develops the fact that the shipper is at fault, then a conference with him is arranged and all of the cards are laid on the table and then he is informed that the company wants to pay him if he feels that he is entitled to something. Mr. Walker says that nine out of ten claims thus refused by the company are withdrawn. But if the company is in any way to blame, the claim is promptly paid and never refused. This policy has induced very good feeling toward the company and has been a strong influence in holding customers who were solicited by other transportation lines. It has the result that if a customer is thinking of quitting the interurban line, he at least gets in touch with the interurban line first, and Mr. Walker says that if it is possible to make some special arrangement to hold his patronage, this is done.

No profit on the pick-up and delivery service provided by the railway at all points is charged the shipper, except for a very small margin to cover any possible error in the estimate of costs. In making up the rate on express matter, a demand charge is included in the figure for the first 100 lb. The rate on the first 100 lb. is then higher than the rate of the American Railway Express Company, and for a small package weighing 10 to 20 lb. it is 50 per cent higher. But by making up the charge on this basis, it is not necessary to penalize the long-haul shipper to make up for the losses on the short haul. Mr. Walker says that the earnings of the Milwaukee Northern Railway, resulting from the merchandising effects of these passenger and freight rates, have shown a very rapid growth. Less than 12 per cent of the total passengers on this road pay cash fare, while more than 88 per cent are using some form of ticket.

On the morning of March 23 the electric railway men were taken to the Cold Springs Shops of the Milwaukee Electric Railway & Light Company in one of the new twenty-five-passenger White buses and, after inspecting the shops, were brought back to their hotel in one of the one-man, two-man, double-truck safety cars, of which the company has a number in operation. Points of particular interest in the shops were the system of spray-painting cars, which has reduced the cost of painting by nearly 50 per cent. A new system of reclaiming oil that has recently been put into effect was said to be returning good oil at a cost of about 10 cents a gallon. The oil is reclaimed to within the limit of 10 per cent of the original specification and the average actually accomplished is within about 4 per cent.

Interest was also shown in a wheel lathe, which by a change in the pinion had been speeded up so that eighteen pairs of wheels are turned a day, requiring one machinist and part of the time of one helper. The same helper also assists on the wheel press adjacent. At a very well attended and much enjoyed banquet on the evening of March 23, P. A. Grau, Milwaukee, acted as toistmaster; the Rev. M. S. Rice, Detroit, Mich., was the principal speaker.

Among the papers presented before one of the joint sessions were two on the controlling elements in rate making and valuation of utilities for taxation purposes respectively. One is abstracted below; the other will be covered in a later issue.

Value of Service as an Element in Rate Making*

The Application of the Service-at-Cost Theory Is Decreased in Proportion to the Essentiality of Public Utility Service and Must Be Abandoned If It Unduly Restricts the Use of Service

BY LEWIS E. GETTLE
Member of Wisconsin Railroad Commission

THE limitations of the cost-of-service doctrine may be discussed generally as limitations imposed by the value of the service. In a sense the question of the value of the service is the old doctrine of charging what the traffic will bear. Rate and price fixing will always break down when it reaches a point where it restricts the use of the product.

The strict application of the cost-of-service theory, which has been attempted in many cases, seems to me to result in part from a failure to analyze the conditions which have led to the present development of the public utility business, and to some extent from a misinterpretation of the essential nature of that business. The most fundamental form of public utility is the public highway. Nowadays it is very rarely that we find a public highway supported on a toll basis. This public utility is supported by general taxation with no attempt to distribute the cost in proportion to its use. An effort in this direction was defeated in Wisconsin at the last session of the Legislature when the bill for assessing automobiles for highway purposes failed of passage. The vote of the Legislature may be considered an expression of the general public attitude toward the distribution of the cost of highway maintenance, and this attitude does not countenance a distribution of that expense on a cost basis. If our highways had been developed on a toll road basis it is altogether probable that we would have had a rate scheme more or less closely approximating the cost of the service. To some extent we have evidence of this in the rates on toll bridges in Wisconsin at the present time, although it must be admitted that the schedules are very imperfect. Another stage in the development of the municipal public utility is also represented by the public sewer system.

The closer the public utility service comes to being an absolute essential, not merely a convenience, the greater must be the departure from the cost-of-service theory of meeting its expenses. The modern waterworks system, also, illustrates this principle. The proportion of water rate schedules have been fixed quite largely by custom, which is merely another way of saying that they have recognized what experience has shown the different classes of service to be worth in proportion to each other. The same conditions which have resulted in the support of highways and sewer systems out of general public funds apply to a considerable extent to waterworks systems. I think it may be safely stated that when the application of cost-basis rates restricts the use of the service below the level necessary for the maintenance of public health, the cost-basis rate must be abandoned. Probably we would be safe in going much farther than this by saying that when a cost-

*Abstract of paper presented before joint meeting of Wisconsin Gas Association and Wisconsin Electrical Association, Milwaukee, Wis., March 23, 1922.

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basis rate seriously interferes with that degree of development in the use of conveniences which we associate with modern civilization, the cost basis must be modified and adjusted and the value of the service must be recognized as an element in rate fixing. The past two years have given us some illustrations in Wisconsin of the limitations imposed by the value of the service upon rates for gas.

It is highly important that the public utility company distinguish between the dissatisfaction which grows out of misunderstanding or agitation and that which grows out of the limited value of the service. The first cause of dissatisfaction can almost always be corrected where it is intelligently handled. The necessities of the past few years have led to rate increases in Wisconsin for individual companies involving a great many thousand customers almost without a single complaint of the results, because the commercial relations of the companies were such that misunderstandings were cleared up and prejudices removed.

Analysis of the rate situation so that where any dissatisfaction exists the utility may determine in what degree it is due to the limited value of the service is a first essential to proper commercial relations and to the proper development of a rate schedule. Despite all that has been said in favor of the cost-of-service basis, the utility which fails to recognize that in developing its system for the service of a municipality it has assumed the obligation of serving the residents of that city in the broadest possible way.

Costs are of great importance and their complete analysis is almost fundamental to the construction of a rate schedule, but a schedule which recognized only costs would ordinarily be unworkable and unsatisfactory. A rate schedule must be based upon judgment, experience and common sense as well as upon costs. I want to stress the limitations upon the use of costs, in the belief that a realization of those limitations makes the intelligent and workable use of the costs more likely of attainment.

Business Economics Holds Europe in Pawn*

A Review of Conditions in the Principal European Countries Based on a Three Months' Trip Recently Completed—The Relation of the United States in the Economic Rehabilitation of These Countries Is Outlined

By Brigadier-General Guy E. Tripp
Chairman of the Board of Directors Westinghouse Electric & Manufacturing Company, New York, N. Y.

THE political leaders of Europe, the military and naval caste and the diplomats have had their day at juggling with the balance of power and now it is settling day, and furthermore, settlement with plodding economics cannot be made in their debased currency.

Of course, I have but little doubt that wars will be, in the future as they have been in the past, the European method of settling international differences; in fact, all indications point in that direction. The enmity between France and Germany is more deep-seated now than it has ever been and it casts an ominous shadow on the future, and the menacing situations all over southeastern Europe do not forecast a long period of peace.

However, one would think that all Europe is too sick to fight again soon.

It would seem necessary for her to inaugurate a reign of sound economics before she can get well, and we American business men are particularly interested in observing how she is progressing in this direction because her disease is contagious.

I have recently visited Germany and find a curious condition of affairs. To a casual observer the country is enjoying great prosperity. Factories are running to their capacity. Railroads and street railways are being improved. Building trades are brisk and there is no unemployment. Workmen are more efficient than before the war and the output per man-hour is greater than the pre-war average.

I visited several of the largest manufactories in Berlin and observed that they had plenty of raw materials, including copper. The wages paid were about one-sixth the rate paid in the United States. Their export business constitutes but a small portion of their business, home consumption being responsible for their activity, and demand was so great that many manufacturers were extending their works.

The impression which I received was that Germany is improving and building itself up as a national industrial machine which will be a formidable competitor in the world's markets when it is in the position to enter these markets.

But the reverse of that picture is the almost hopeless condition of her State finances.

The mark is worth less than ½ cent in our money; in other words, German paper money is almost worthless. The people themselves don't like to take it. Let me give you an illustration. I was unable to secure rooms in any hotel in Berlin because the city was crowded with visitors on account of a race meeting and automobile show, and I went to a boarding house. When I left, the landlady asked me to pay her in American money, saying that, if I had none with me, she would prefer to wait and have me send it to her after I returned to New York. She said she was saving all the American money she could get. Here is perhaps a case of a debased currency too sick to get well; people may soon refuse it altogether and thus hard money—gold or siver—be gradually introduced into circulation. This would, of course, involve repudiation of the national debt and industrial ruin.

In the meantime Germany is apparently enjoying prosperity; and wages, while low in comparison with ours, are constantly on the increase; but people with fixed salaries are suffering badly from the depreciation of the currency. Of course, the situation is enormously complicated by the indemnity demands which are admittedly more than she can pay. Notwithstanding she is wealthy as national wealth is usually measured—that is to say, in farm lands and buildings, well-built cities, railroads, factories, etc.—it is wealth which is not available to pay foreign debts, except by the methods of the Middle Ages when the victor put the conquered population to the sword—men, women and children—and seized the country for their own.

The Germans do not admit that they were conquered in the first place; and, in the second place, if they were conquered, they still have their wealth, which under existing conditions is wealth only where it stands—that is to say, in their own hands. She cannot pay the indemnity as it now stands, therefore there has been no progress toward a solution of her fiscal problems. Germany, in short, is all dressed up and nowhere to go.

France is not an industrial nation in the sense that the word is used to describe Germany, England and the United States, and its economic problem is more nearly a state problem than in case of England or Germany; that is to say, if her government finances could be put in sound condition, her troubles would be largely over because she can support her population without a large export trade.

France is a great fertile plain with the finest peasant population in the world, but they don't like to pay taxes. Perhaps they think they paid enough taxes to support the brilliant people of the Court of Louis to last for two or three centuries. Be that as it may, they don't like to pay taxes, and the French statesman is reluctant to assess them.

The French also like their taxes in homeopathic doses, which accounts for the municipal tax frontiers.

Every large city has its custom office at city limits and imposes a small tax upon goods being brought into the city. For example, if you take a drive out of Paris, you must measure the gasoline in your tank and pay a duty if you come back with more gas than you went out with. The French hate taxes so badly that their system of assessment and collection is a very sketchy one.

Then, of course, France expects a

*Abstract of address presented at the annual dinner of the New England Street Railway Club, Boston, Mass., March 23, 1922.

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large indemnity from Germany and I can assure you that she intends to get all that Germany can pay; and I don't blame her for that. Until she is satisfied that the maximum is forthcoming she will continue to maintain a large army, consequently her expenditures still largely exceed her income.

France has not made any substantial progress toward balancing her budget, but her currency is not so hopelessly debased as that of Germany. If she could increase her taxes, or rather actually collect them, and reduce her expenditures in order that income should at least equal the outgo, then it might be possible to peg the franc at a stable value and stop its fluctuation, which is so deadly to business. That is to say, if she had a gold reserve which would permit of the redemption of the paper franc at 10 cents, for example, let specie payments be resumed at that figure. It would be a bitter pill to swallow and might require a scaling of her internal debt; or, in other words, partial repudiation; but it would result in a stable currency.

Italy has, in addition to her debased currency and her deficit, the problem of over-population in a country of which a very substantial portion is mountainous and cannot be cultivated, although even you New England farmers would be surprised to see what an Italian can do with a rocky mountainside.

A large emigration from Italy to South America may be one of the answers to over-population.

I have no figures, but my impression was that the clergy, military and naval officers, soldiers, police and holders of offices in government bureaus constituted quite a large proportion of the population. The financial burden of supporting these non-producers must be tremendous. Italy's currency fluctuates in value to the detriment of business, and she might also adopt the plan of stabilizing it by establishing a gold redemption value of the lira at less than its old parity, but the operation would be a more painful one than in the case of France because her currency is more debased.

It is characteristic of England that she should be the first to make real progress in setting her house in order. Her problems were and are very formidable, but every little while you see her really settling something and then turning her attention to something else. Her action regarding Egypt is the latest step. I was in Egypt in February of this year and found there a concerted cry of Egypt for the Egyptians.

One can understand the racial instinct to be free from domination of another race; but, when you see the great things the English have accomplished in that country and the relief that they have given to the native who was almost literally taxed to death under the rule of the Khedives, you wonder that they would dare to reinstate the old régime. I couldn't discover that England had interfered with their social customs.

Great Britain met the situation through an arrangement under which the Egyptians form their own government and run their own political affairs, with a provision for British protection of her investments and the establishment of a kind of Monroe Doctrine. In spite of her Irish problem, her Egyptian problem, her Indian problem and her very perplexing home industrial problem, the exchange rate on the pound sterling is steadily rising and there is every reason to believe that it will soon be established on the pre-war parity of $4.86. She is taxing incomes heavily, perhaps more heavily than any other nation in the world, and will probably balance her budget next year. It is truly a wonderful showing, and she is entitled to the respect and confidence of the world.

When the Versailles conference carved a lot of new little states out of Germany and Austria on the idealistic theory of self-determination of peoples, it at the same time set up an equal number of new trade barriers and the flow of commerce became more clogged at the very time when an easier flow than ever was demanded.

All these new countries established custom offices on their frontiers and in addition to all this the old countries inaugurated Chauvinistic policies and raised new tariff barriers to encourage home industries. If trade could be freed from these artificial restrictions to a large extent, it would greatly help the situation.

The European situation would be interesting to us if we were merely onlookers, but we are more than spectators. We are vitally interested both as a creditor and as a commercial nation. At this moment there is no public sentiment here which would support the cancellation or reduction of the foreign debts which are owed to us, and I think public sentiment is right. It might be a wise policy for us to waive interest payments, but it seems to me that until Europe has worked out some definite plan for stopping her financial toboggan it would be idle for us to attempt to stop it by interposing a surrender of our claims only to have its benefits swept away by further deficits. If the time should come when a compromise of the amounts due us would clearly help a solvent and economical but overburdened people, then I should not expect the United States to insist on its pound of flesh. However, it is easy to generalize. The application of any remedy whatever is very difficult, and much must be left to the inexorable workings of economic laws; in fact, about all that can be done is to remove the obstacles in order that these laws may work freely.

In my opinion, the United States has nothing to be ashamed of; we went into the war with no thought of material gain. We did our best and did a great deal, and we came out of it with clean hands. We paid our own way and lent our wealth liberally, and we cannot now be justly criticised for waiting until Europe has shown its ability and intention to live within its income before we compromise our loans. I do not for a moment say that she is not doing all that she feels she can safely do to accomplish this end. But I do say that her large standing armies and navies and expensive government bureaus, even if they are necessary, are not the character of expenses which this country feels called upon to finance.

The Public You Serve Is Your Judge*

The Mass of the American Public Is Essentially Fair and Generous—Its Judgment as to Satisfactorily Adequate Service Cannot Long Be Wrong

By E. Mark Sullivan
Corporation Counsel, Boston, Mass.

YOU have your difficulties, and they are with the great public which you serve. The motto, not only of you railway men but of every man dealing with the public, is "Service," and no service, however adequate, essentially adequate, can be satisfactorily adequate if the public fails to appreciate it.

You men have for years permitted yourselves to be regarded as persons engaged in the chief enterprise of robbing the public through the instrumentality of the cars and railways which you operate. You have failed adequately to take the public into your confidence. I have an abiding confidence in the great mass of the common people. They have never been ultimately, nor for long time, wrong.

When the great Washington came here to New England to take control of the Continental troops the most he sought or hoped for was conciliation with the mother country on terms of honorable peace and conciliation. But public opinion ruled otherwise. When that vast territory we know as Louisiana was offered us for little or nothing by France the great Jefferson was opposed to accepting it, and only yielded because he listened to the voice of the great mass of the common people. Lincoln himself came to Washington as the newly elected President, hoping only that slavery might be restricted as to its territorial extent, and finally became the Great Emancipator only because he had a perfect sense

*Abstract of address at the New England Street Railway Club, Boston, Mass., March 23, 1922.

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of the persistent demand of the common people of the country. Even that other man who in time became his successor —Woodrow Wilson—became great because he in the end listened to the voice of the common people.

Boston Elevated Success Due to Good Public Relations

The American people are fair. They are by every instinct generous. I wish to pay my tribute tonight to Hon. James F. Jackson and his associates for the efforts which they are making to give to this great city a decent and adequate transportation system. And they are enjoying at the hands of the people of Boston today a sympathy and an intelligent tolerance that I believe few railway managers ever enjoyed in recent years. And the reason of it all is that no man goes to their office inquiring regarding the economics of that railway system without receiving prompt and generous explanation to every question of inquiry that is put to them.

The public are generous. They want to understand your problems. Why should they be retained within the inner offices of some dark chamber, as some dark mystery? The minute the railway employees say, "We want greater wages," the generous heart of the people says, "Give it to them," even though the fact still remains that the great mass of the people are themselves employed at wages which are perhaps extremely inadequate for a decent living, and the wage which you are paying these very men who seek for more is far in excess of what they are getting. That is born not of an economic understanding of your difficulties, but of a generous impulse of the heart. Come to them, you railway men of New England, come to them frankly; speak to them often; bring to your council boards men who are fairly representative of them, not of the railway employees, but of the great body of the public itself that you seek to serve. Speak to them frankly, not in those confusing tables of statistics that hardly anybody can read who has not helped to construct them within your counting rooms, but speak to them in simple terms, and you will find that they will give to your messages of frankness a generous response which will be encouraging to you, that will make your offices things of honor to yourselves and others instead of things of infamy as they are too often viewed by the great mass of the common people.

You are too often damned in case the public you serve are unreasonable, but it is because they do not understand. We ask for so much from our municipalities, and next to that from our public service corporations, not thinking that after all there is a countervailing proposition that must follow, until finally we find the whole economic system oppressive. After all, all these things come out of the loins of the common people. They are not quick to understand it. Indeed, most of these economic problems are so involved that oftentimes even you don't see clearly the proposition that lies immediately before you. Then how can they? But, be generous with the great mass of the common people. They have always been right in the history of this country. They have an instinct for right. They have a native impulse for generosity. They would deal generously with you. I feel that after all there is applicable to your situation with relation to the public what was said and is often said by the French people: "To know all is to understand all."

Possibilities of Developing Chicago's Transportation Facilities*

Chicago Needs Some Subway Facilities Now and a Comprehensive System Ultimately — Tremendous Immediate Betterments Possible in Existing Surface and Elevated Lines Prevented by Condemnatory Municipal Sentiment—Buses Rapidly Becoming a Factor

By Harry L. Brown
Western Editor Electric Railway Journal and Bus Transportation

THE whole aspect of the transportation system in Chicago could be changed almost over night if the present destructive, insincere, condemnatory sentiment toward the traction companies as fostered by the municipal authorities were to be replaced with a spirit of co-operation and fair dealing. The inadequacies of the present facilities may be almost wholly attributed to the inability of the companies to finance improvements, and this inability is altogether a result of the belligerent attitude just mentioned. The real marvel is that so much service is given and that so much progress has been made by the present companies with the limited facilities at their command and under the conditions prevailing.

The efforts of the city hall have been concentrated on an endeavor to get a 5-cent fare, despite the fact that the courts have repeatedly held this to be impossible. As to the subway project, sufficient money has already been paid into the city's traction fund by the street car riders to pay the entire cost of a stretch of subway extending from Chicago Avenue to Sixteenth Street. This, if placed at the disposal of the present elevated railways, subject to proper rental charges, would make possible an improvement in service of most important consequence to every section of the city now served by the "L" lines.

One of the greatest handicaps to any increase and speeding up of elevated service is the fact that the usable capacity of thirteen tracks is limited to the capacity of but two tracks through the loop. The subway suggested is the initial step proposed by the Traction and Subway Commission in its very able plan for a comprehensive subway, elevated and surface lines system. This initial piece of subway would open the way for a tremendous improvement in "L" service, provided again that the fundamental credit of the companies were restored through proper attitude on the part of the municipal authorities and the people generally, so that the additional equipment needed could be financed.

*Abstract of paper presented at Mid-winter Convocation of Engineers, Chicago, March 22, 1922.

If this initial step in the subway plan were completed, it would so relieve the situation that the further subway construction could follow along in a normal program as needed without burdening the city beyond its financing capacity or beyond an amount that could be carried by the resultant earnings. There has been much discussion as to the best location for the north and south bore of the initial subway through the central business district. The Traction and Subway Commission recommended that it be placed under State Street. With the recent very wonderful development of the Upper Michigan Avenue district, there has been much agitation for putting the initial bore under Michigan Avenue. My own opinion is that it might better be put under Wells Street in order that it may be nearer to the future east and west center of the loop district.

The first stretch of subway north and south through the loop district connected up with the elevated system would make it possible to relieve the elevated loop of all of the north and south trains, thus making the entire capacity of the loop available for the west side elevated trains. This would increase the capacity of the whole elevated system substantially, and afford an improvement in service that would be very notable.

The next logical step in subway development would be a pair of east and west subways for the use of service cars. This would gradually relieve the vehicular congestion in the loop district and make it possible to cut probably fifteen minutes from the running time of the west side surface cars.

Chicago is in need of some subway facilities now, and a comprehensive subway system ultimately. But there are tremendous possibilities of improving present traction facilities if, without any subway construction at all, the present companies were in a position to finance betterments. There are a number of improvements of very far-reaching effect in the minds of the local traction officials which would be carried into execution if they could be backed up with the assurance that the further investment in the properties would not

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be jeopardized in the manner in which the present investment has been. At the same time the service now being rendered and the general property of the companies is excelled in few if any other cities. Our local companies are equipped with the brains and the will to give Chicago the greatest transportation service known to the art, if given a fair opportunity.

In a general consideration of the transportation facilities of Chicago, there is a new kind of transportation that has reached such a point of development that it merits very serious consideration. I refer to the use of motor buses. Chicago already has the Chicago Motor Bus Company operating on the north side, which is now carrying nearly ten million passengers per year and operating sixty buses 1,750,000 miles a year. This is only a beginning, for the operations of the company are limited to the north side, though plans are formulated for extending the service to the boulevards of the south side and possibly the west side. The Depot Motor Bus Lines, Inc., is operating a special service for commuters and shoppers between the Union and Northwestern stations and the State Street shopping district. This company carried approximately 600,000 passengers during the year 1921 with an equipment of eleven buses. Several bus lines are operating from terminals of the elevated lines out into the neighboring territory beyond. The Edgewater Beach Hotel is operating a regularly scheduled bus service for the use primarily of its own guests.

There are a number of other routes in the city over which buses could be operated to provide a service that would be much appreciated. There is also the possibility in the comparatively near future of the establishment of what may be called rapid transit motor bus service. This would consist, for example, of a de luxe non-stop, high-speed bus service between the loop and such thickly populated centers as the Wilson Avenue district, the Sixty-third Street district, or some of the west side centers. A necessarily high rate of fare would be charged and it would attract, in the main, people accustomed to driving their own automobiles and hence willing to pay for a service comparable in speed and comfort with that of their own car, though cheaper, and relieving them of the down-town parking nuisance. Such a service could not be said to compete particularly with existing railway lines for it would create largely its own traffic.

Similarly, the bus lines already in operation may not be considered to be really in competition with the rail systems of transportation. Strictly speaking, they may haul some people who would otherwise use the street cars or elevated lines, but in large proportion their patronage comes from a newly created traffic which did not exist in this section before the bus service was inaugurated.

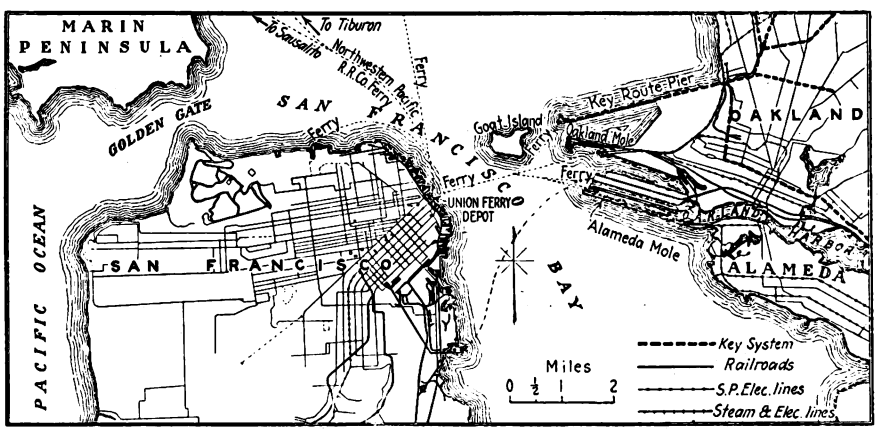
As long as all such bus lines are operated so as to be supplementary or complementary to previously existing transportation lines, they should likewise be given every encouragement. The development is economically sound, as it increases the means of communication, but any substantial duplication of service is dangerous not only to the older transportation agency but to the new one as well. Chicago has had one example of the effect of duplication of service in the Oak Park "L" and the lesson should not be lost.

This leads up to the great desirability, from the standpoint of the people, of having all of the transportation facilities of any one community under the control of one transportation organization. That is the practice in many European cities. Unified operation of all the elevated, surface and subway rail systems and surface bus lines assures the use of each in the field for which it is particularly suited and results in the most complete service at the lowest cost. It brings about a co-ordination of facilities and an efficiency in their use which cannot be gained through independent operations. Hence without attempting to go into detail, an enlightened settlement of Chicago's transportation problem would dictate that an early consideration of all transportation facilities should be effected. This, of course, means the working out of a contract between the city and the transportation companies which will insure good service at the lowest cost to the people of Chicago and the opportunity to the company to earn a return on the investment which will continuously attract to the business the large sums of money needed to extend its facilities in keeping pace with the growth of the city.

Key Route Discussed by W. R. Alberger

At Meeting of Pacific Traffic Association Vice-President of San Francisco-Oakland Terminal Railways Tells of the Goat Island Terminal Project and Gives Operating Data of Railway System

W. R. ALBERGER, vice-president and general manager San Francisco-Oakland Terminal Railways, read a paper entitled "The Goat Island Terminal Project" at the meeting of the Pacific Traffic Association held in San Francisco on March 7, 1922. This title does not indicate the scope of the entire paper, because after telling all that he could about the project of his company to extend its lines to Goat Island in San Francisco Bay, Mr. Alberger gave his hearers a great deal of general information regarding electric railway operation and the operation of the "Key System" in particular.



SAN FRANCISCO AND SURROUNDINGS, DRAWN TO SHOW RELATION TO GOAT ISLAND TO EXISTING TRANSPORTATION FACILITIES

First as to the Goat Island proposition, he traced the history of the island and said that it has long been looked upon by railroad engineers as a proper terminal point for transcontinental railroads. As late as September, 1920, Admiral Joseph F. Jayne, commandant of the Twelfth Naval District, outlined a plan for a terminus at Goat Island by the extension of a trestle or pile bridge from the Key System Mole to the eastern side of Goat Island; thence through a tunnel or by a track skirting the island around to the northwestern side, at which point it was proposed to build a ferry terminus.

In 1900 when the Key System was first projected, its promoters had in mind the development of Goat Island as a terminal, but the earthquake and fire of 1906 threw such an unexpected burden of traffic upon the Key System and its affiliated street car lines that the plan of making the island a terminus was abandoned. On Feb. 9, 1922, however, the San Francisco-Oakland Terminal Railways filed with the Secretaries of War, the Navy and Commerce an application for permission to do certain things toward creating a terminal. It also requested the government to establish bulkhead and pierhead lines. If a favorable decision is received the company will proceed along the following lines:

1. Extend the present solid fill as far as the government will permit.

2. Build from the end of that fill to the vicinity of the northeast corner of Goat Island a trestle or bridge, or

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trestle and bridge, and upon the extensive shoal lying north of the island create a terminal by surrounding a portion of the shoal to be used with a loose rock wall and then, by dredging the sand from the bottom of the bay to the inclosed space within the rock wall, create the terminal site.

The procedure outlined is similar to the method adopted in the construction of the solid fill a few years ago. The large ferry terminal would then be established near the northwest corner of the island. The plan is to create a union terminal that can be used by the company's lines or any other lines, electric or steam, and also by automobiles.

Operating Facts Regarding the Terminal Railways

Leaving the subject of Goat Island, Mr. Alberger took up the more general one of street railway problems, illustrating them from the experience of his company. For example, in the matter of taxes those of the company increased in 1921 over 1920 nearly $50,000 or almost 15 per cent. He pointed out also that a street car company is obligated to furnish ample transportation facilities on its different lines, a sufficient number of cars at proper headway to accommodate the traffic. His company operates every car upon a definite time schedule. A careful check of car operation during twenty-four hours indicated that 92 per cent of all the cars pass a given central point exactly on time.

In 1921 the company carried 111,759,675 passengers with only one fatality, and that not caused by the negligence of the company or its employees. During the year the cars made 16,887,649 revenue-miles, which is equivalent to one car making 2,612 round trips by the shortest route between Oakland and New York, or an average of more than seven such round trips daily. The company had a total of 3,554 accidents, an increase of ninety-three over the previous year. Of these, 2,480 were beyond the control of the company or its employees, and of the 2,480 accidents 2,224 were occasioned by automobiles running into the cars. The accidents over which the employees had control decreased 174 during the year.

Again, electric cars require more inspection and cost more for upkeep than the steam railway cars. They each make hundreds of stops per day, many requiring emergency brake applications and reversals of electric power. On this property in 1921 the cars averaged 181 miles per day. They were inspected a total of 256,798 times and thoroughly cleaned 186,385 times. More than 600,000 windows were cleaned.

Operation of Key System Expensive

The operation of the Key Division of the property, including ferry boats and connecting trains, is very expensive. On this system the rates of fare, he explained, are the lowest, both single trip and commutation, for the kind of service furnished, in the entire world. The average rate per mile, one way fare, for the longest haul of 13 miles, is 1.38 cents. For the average haul it is 2 cents per mile. The average rate per mile for monthly commutation tickets, costing $4.80 for the longest haul, is 0.6 cent, and for the average haul 0.87 cent. The trans-bay rates, both one way and commutation, are not, and never have been, remunerative.

The commissary department of the Key Division during 1921 earned nearly $122,000 net from the operation of its restaurant, news stand and bootshining stand. This was 23 per cent of the entire net income of the division. In other words, notwithstanding the facts that in 1921 nearly 16,000,000 people were carried, that the boats made 39,388 trips, or 113,024 boat-miles, and that 314,560 trains made 3,188,129 car-miles to and from seven different east bay localities, nearly one-quarter of the entire net income of the division came from selling food, gum and periodicals and from shining shoes. The remaining three-quarters came from transporting millions of people according to their desires with the large amount of transportation facilities which were furnished as described.

Convention of Southwestern Association

THE latest bulletin of the joint convention committee gives information, supplementary to the note appearing in the issue of this paper for March 4, regarding the first joint convention of the Southwestern Electrical & Gas Association and the Southwestern Geographic Division, N.E.L.A. This will be held at the St. Anthony Hotel, San Antonio, Tex., May 3 to 6 inclusive. Those planning to attend are urged to make hotel reservations promptly through the convention committee, S. J. Ballinger, San Antonio Public Service Company, chairman. The committee has arranged for special rates at the St. Anthony, Menger and Gunter Hotels and can obtain rates also at Travelers, Lanier, Crockett, Hutchins and other first-class hotels.

The convention will open on Wednesday morning, May 3, at 9.30 o'clock, with a general session in the ballroom of the St. Anthony Hotel, and general sessions will be held each morning during the convention in the same room. The afternoons will be devoted to departmental sessions.

American Association News

Membership Placard Sent Out

THE committee on company and associate membership has distributed, throughout the association, copies of an attractive membership card in colors for display in offices. The committee suggests that the card be framed and hung in the offices of member company executives and especially in those of purchasing agents, where it is hoped that it will be a reminder of the advantages of the membership. A reproduction of the card in one color was given in the issue of the ELECTRIC RAILWAY JOURNAL for March 4, page 353.

Rousing Dinner Meeting of the Connecticut Company Section

RAILWAY men from all parts of Connecticut flocked to New Haven on March 21 to attend the first dinner meeting of the Connecticut Company section for the current year. The Connecticut Company orchestra made its first appearance at the dinner, which was served at the Hotel Garde and attended by 176 members and guests.

S. W. Baldwin, of the legal department, presided in the absence of President Chapman. W. J. Flickinger, assistant to the president, opened the program with a report of the Midyear Meeting of the American Association. J. K. Punderford, vice-president and general manager, supplemented the story of the Indianapolis meeting, and explained the local fare situation in the towns of Norwalk and Bridgeport.

The plan was to call for reports from the division managers, but there was time for reports from only two, W. J. Kingdon, Stamford division, who told of his experience with motor bus operation, and J. B. Potter, Bridgeport division, who told of the situation in his territory. The members present were pleased with this plan of having reports from the divisions.

The next speaker was H. H. Norris, ELECTRIC RAILWAY JOURNAL, who spoke of the permanency of the electric railway industry, and pointed out the place of the motor bus in relation to electric railway service. President L. S. Storrs, the principal speaker of the evening, then gave a frank and interesting talk regarding buses and their relation to regular trolley service. He also traced the history of the jitney from the time of its inception on the Pacific Coast. Mr. Storrs quoted statistics of operation of the Connecticut Company and encouraged his associates by his statement that conditions on the property are improving.

Big Growth for Camden Section

AT THE last meeting of the Public Service Railway company section, Camden Division, the election of 106 new members was announced. The meeting was of a social nature, with boxing bouts, clog dancing, singing and orchestral music. There was also an exhibition of feats of strength by the "strong man" of the section.

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Recent Happenings in Great Britain

South Eastern Railway Electrification—Statement of What May Be Expected Along These Lines in Future

(From Our Regular Correspondent)

ANNOUNCEMENT was made by the chairman, Cosmo Bonsor, to the joint meeting of the South Eastern and the London, Chatham & Dover Railway Companies, regarding the long-projected scheme for the conversion to electric traction of the suburban lines of two associated companies. He referred to the destruction of the companies' short-distance metropolitan traffic by tramway and omnibus competition, and said that the revenue obtained outside the metropolitan area was threatened by the extension of road competition.

Ambitious Electrification Project Postponed

Before the war the directors were preparing plans for the electrification of the companies' system within a radius of 20 miles of London. The war postponed the scheme, and at the end of the war government control had so diminished railway credit that it was impossible to raise the capital. The Trade Facilities Act was passed last autumn, and the directors immediately took the opportunity that it gave of asking for a government guarantee as to principal and interest of new capital. They were able to show the government that with seven London central passenger stations they had a splendid position for distributing passengers and would be able to increase development in Surrey and Kent. The proposals met with favorable consideration, and the explanation that it was impossible to ask the shareholders in present circumstances to consent to a direct obligation by the issue of capital was also accepted by the government committee on the subject. It would be necessary to form a construction company. Its capital would be small, and it would not trade for profit. It would have borrowing powers sufficient to cover the cost of construction. The money borrowed would carry the government guarantee both as to principal and interest, and would be obtained on the most favorable terms.

Long-Term Leasing Arrangement Proposed

The works would be the property of the construction company and when complete would be let to the two associated railways on lease for twenty-five years at a rent sufficient to repay the capital and interest at the expiration of the lease, when the works would become the property of the two companies. The opportunity was unique, the arrangement good, and the figures as to results were estimated to be extraordinary. Taking a very moderate increase in the number of passengers, along with an ascertained decrease in working expenses, the directors estimated that in the second year of working not only would the rent be earned but there would be a good margin of profit which would increase as years went on.

On Mr. Bonsor's announcement it may be remarked that the arrangement which he outlined is a peculiar one so far at any rate as British railways are concerned. I believe that at present the South Eastern and Chatham Companies do not possess Parliamentary powers to use electric traction, and that the plan outlined by Mr. Bonsor will enable the work to be put in hand without the delay of getting Parliamentary powers. The Ministry of Transport has power to issue orders to facilitate railway development, and evidently these are sufficient to meet the present case. The Ministry, I understand, made an order some time ago. The difficulty of raising capital will be overcome by the government guarantee. Probably it is on account of these special arrangements that the difficulty encountered by the London, Brighton & South Coast Railway in raising loan capital (as explained below) has not emerged.

Electrification to Continue as Circumstances Permit

The chairman of the London-Brighton & South Coast Railway, C. Macrae, made it quite clear at the annual meeting of the company that while the electrification of the London suburban lines would be continued as circumstances permit, the conversion of the main line to Brighton is still a matter for the future. He said that the extension of the electrical system to the railway from Balham Junction to West Croydon, which passed through a congested area, was nearing completion, and it was hoped that this section would be open for electric traction by Sept. 1 next. This section, however, formed only a small part of the whole scheme which had been prepared by the company's consulting electrical engineer, Sir Philip Dawson. The full scheme had been submitted to the Ministry of Transport, and it included the electrification of the whole of the suburban area as well as the equipment of the main lines to Brighton and Lewes, with which in course of time it was hoped to proceed. The outlay of capital would be very considerable, and as the present time was not opportune for raising money the directors had determined that until the times improved extension of electrification should be confined to those sections of the suburban system where the needs were greatest. The grouping and amalgamation of companies, as provided by the Railways Act, 1921, was having a paralyzing effect on schemes of electrification. The London & Brighton Company was to be amalgamated with the South Eastern & Chatham and the London & South Western Companies. Each of these companies had a different system of electrification, so that there was a bar on the London & Brighton Company going ahead with its own program. The Ministry of Transport had, however, appointed a committee to report on the steps advisable for the companies concerned to take on the electrification schemes they had in contemplation. In regard to capital for developments, the directors had thought that there might be a possibility of obtaining powers from Parliament to raise money by borrowing without being put under the obligation that the exercise of borrowing powers should be contingent on a previous issue of three times the amount of share capital. Application was made for a Parliamentary bill for the purpose, but objections were raised by debenture and preference stockholders and others. In the meantime the appointment of the Ministry of Transport committee above referred to was made, and as the main reason for the promotion of the bill was to obtain capital for electrification work, the advisability of waiting for the report of the committee became obvious. The directors had accordingly deemed it wise to withdraw their bill from Parliament.

R. H. Wilkinson, general manager of Bradford Corporation Tramways, in the course of an inquiry regarding an application by his municipality for further borrowing powers, made the remarkable statement that owing to the increased cost of tramway track construction 75 per cent of the town Council's lines would eventually have to be abandoned unless some form of transport cheaper than the tramcar was adopted.

Surface Lines Spurred to Advertise

The London County Council, spurred on no doubt by the intense competition of motor buses, continues to advertise its tramway undertaking vigorously. A recent poster informs the public that the total cost of the system has been £14,500,000, and that the capital repaid out of revenue to date amounts to £6,000,000. The sum paid last year for interest on and redemption of capital was £600,000. It is proudly added that when the balance of capital indebtedness has been paid off Londoners will own the finest tramway in the world, and debt charges will be nil.

The first year's working of all-night tramcar services in Glasgow has resulted in a loss of £1,098.

At the British Industries Fair, held in London early in March, an exhibition of some of the artistic designs for London underground railway posters received much attention from foreign buyers who visited the Fair.

In the House of Commons on March 13 it was officially announced that the Treasury had agreed to guarantee a loan to be raised by the London underground railway companies for the extension and improvement of its tube railway system. This means that the long-contemplated developments are likely to be put in hand soon.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Paving Requirement Modified

Commission Unwilling to Pass Added Burden of New Paving on to Car Riders

In spite of a contract calling for repairing of Yale Avenue, Swarthmore, Pa., the Philadelphia (Pa.) Rapid Transit Company has been freed from all obligations except those included in repairing its own tracks and paving between them and for 18 in. on either side. This decision, handed down by the Public Service Commission on Aug. 16, 1921, and just published, is based on the principle that the ordinance provisions were unjust and unreasonable, would result in increased expenses to the company that would devolve upon the public and that anything which stands in the way of securing reasonable and adequate service or imposes upon the public an unnecessary burden of increased rates opposes the public policy of the State.

The borough of Swarthmore, in submitting the case to the Public Service Commission, protested that the municipal ordinances should be the factor used by the Public Service Commission in determining the duties of the railroad company. The company admitted the jurisdiction of the commission, as did the city, but contended that its duties must be determined by the commission upon the facts disclosed by the evidence by applying the commission's principle of what is a just and reasonable standard.

The report of the commission reviews the history of the case and shows that the Philadelphia, Morton & Swarthmore Street Railway and the borough of Swarthmore made a contract in September, 1900, whereby the traction company was given permission to operate on the streets of the borough, and in return agreed to reconstruct the paving on Yale Avenue from curb to curb. Under the type of paving adopted originally and with the wear and tear to which the roadway was then subjected the cost to the railway of meeting its paving obligation was about $490 a year for the entire area involved. Since then, however, the situation had changed and the type of paving originally installed had become entirely inadequate. When the time came to pave with new and more expensive material it was sought to shift the added burden to the railway.

The commission pointed out that the railway offered evidence, which was not contradicted, to show that its total annual revenues from the Borough of Swarthmore in 1919 were $10,080 and its yearly operating expenses in conducting that service $9,070. It is obvious, therefore, according to the commission that if the complainant's contention was sustained and the ordinance provisions made enforceable, either in the courts or before the commission, one of three eventualities would occur:

(a) The company would be so shorn of revenues that the public, including the Borough of Swarthmore, would ultimately be deprived of all street car service.

(b) The rate of fare imposed upon the Swarthmore patrons would be increased so high as to be practically prohibitive.

(c) The financial burden of maintaining the Swarthmore service would have to be passed on to and be borne by other car riders of the Philadelphia Rapid Transit Company in Philadelphia and elsewhere, who are not immediately concerned in the Swarthmore service.

In consequence of the condition of affairs thus recited the commission ruled as follows:

> Any or all of these contingencies are violative of the basis upon which proper public utility regulation rests. The utilities no longer function as private enterprises. They have public duties to perform. They are required to render adequate service at reasonable rates, and the rates must produce the revenue to maintain that service. To require the car riders to pay what would appear to be exorbitant rates, or to accept the alternative of being obliged to forego the benefits of all service because the operating company's revenues are required to be diverted in order to meet such ordinance obligations, is as unwise a public policy as it is bound to be destructive of the service which the public require and which such carriers are expected to render.

In short, the commission, after reviewing briefly the intent of the legislation creating that body, said that "it would be a waste of argument to attempt to establish the obvious, namely, that the commission is called upon to exercise the police power of the State when rates are involved, but cannot do so where service, facilities and practices, affecting intimately the same public, are involved."

Wage Agreement Reported

Railway employees of the Dominion Power & Transmission Company, Hamilton, Ont., are reported to have reached an agreement on wages as a result of the efforts of a board of conciliation which was appointed under Federal labor laws to arbitrate the dispute. The proceedings of the conciliation board were interrupted while the parties were brought together. The definite results were not announced, but it was stated that a basis of agreement had been arrived at and that when the contract is drafted it will receive the ratification of the board of conciliation without further litigation.

New York Hearings Postponed

Frank Hedley, president of the Interborough Rapid Transit Company, New York, N. Y., said on March 24 at the hearing of the Transit Commission that he would advance his program for the purchase of 350 cars now contemplated during the next five years if the Interborough could get from the Manhattan Railway, which owns the elevated railway system, a reduction in the present rent for the elevated lines.

Mr. Hedley said that if the city would provide the necessary storage yards and shop facilities, and if there were no difficulties about power, it would be possible to begin to put the cars into service in about seven months after a start was made. The purchase of additional cars would permit the Interborough to extend its period of maximum operation so as to spread the rush-hour traffic over a longer time.

Ex-Justice Clarence J. Shearn, special counsel of the commission, said Mr. Hedley would be questioned concerning the possibility of improving the service in non-rush hours at a subsequent hearing.

Upon the representation of James L. Quackenbush, general counsel of the Interborough, that the crucial period in the negotiations of that company with the Manhattan Railway for a reduction of rent would occur during the week ended April 1, the commission adjourned its inquiry into Interborough service until the afternoon of March 30 and agreed to postpone the Interborough valuation hearing, scheduled for March 29, for a week. Mr. Quackenbush said that Dwight W. Morrow of J. P. Morgan & Company, representative of the 5 per cent bondholders, was expected to return on March 27.

Engineering Congress Should Be Internationally Promoted

A very pronounced feeling exists in engineering circles in Washington, D. C., that the proposed Engineering Congress to be held in connection with the Philadelphia Sesquicentennial should be promoted in a national and international way, and that this can best be done by the Federated American Engineering Societies. Local promotion of the congress would be handicapped, it is believed, by the assumption that Philadelphia engineers naturally would be inclined, by the incidental benefits to their city, to represent such a gathering as certain to be a momentous occasion. If the arrangements were handled by the national machinery which the organizations in many branches of engineering have set up it is believed a distinctly different impression will be created.

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Another Subway Plan for Chicago

Committee of Local Engineers Prepares Plan for Local Transportation Committee, Giving Locations and General Designs for Initial System in the Central Business District

A COMMITTEE of five Chicago engineers comprising Bion J. Arnold, chairman of the Board of Supervising Engineers, Chicago Traction; R. F. Kelker, Jr., city supervisor of transportation; Harold Almert, representing the American Society of Engineers; Charles E. Fox, Illinois Society of Architects, and Joseph H. Prior, Western Society of Engineers, appointed by the local transportation committee, Chicago City Council, made its report to the transportation committee on March 27, presenting locations and general designs for an initial subway system.

This committee of engineers has served without pay as the result of a resolution passed by the transportation committee of the City Council on Feb. 21, 1922, requesting recommendations for its guidance.

The engineer committee recommended the immediate construction of two east and west and one north and south low-level subways for the use of surface cars, and one high-level north and south subway for rapid transit purposes. The surface car subways are planned for Washington Street and Jackson Boulevard, extending from Grant Park on the east to Clinton Street on the west; and under Clark Street, extending from Thirteenth Street on the south to Grand Avenue on the north. The subway for rapid transit purposes would be located under State Street and extend from a junction of the South Side Elevated Railroad at Eighteenth Street to Division Street on the north, thence west in Division Street to a junction with the Northwestern Elevated Railroad near Franklin Street.

The Washington Street surface car subway would be connected with the present Washington Street tunnel under the river, which is so constructed that connection could be made to it at either end without changing the permanent structure. The subway under Jackson Boulevard would connect with the tunnel under the river at Van Buren Street. Through these two east and west subways, about 80 per cent of the surface line cars that now serve the northwest and southwest portions of the west side could be operated. The Clark Street subway would serve to handle approximately 45 per cent of the surface cars now operating through the business district and serving the north and south parts of the city. It could take care of practically all of the through-routed cars, while the morning and evening rush-hour trippers could be operated on loops now in place on the surface. These three surface-line subways would all be built with two tracks.

The engineers estimate that the Washington Street subway could be constructed as a tunnel and not seriously disturb the present utilities in the street, at a cost of approximately $4,500,000. The subway in Jackson Boulevard could be similarly constructed at a cost of about $4,900,000. Owing to the limited space between the top of the Illinois Tunnel Company's structure and the surface of the street, the construction of a subway in Clark Street would necessitate taking care of the utilities now in the street by means of suitable utility galleries. For this reason the engineers estimate the cost of this subway, including the cost of taking care of the utilities and the new tunnel under the river, at about $9,000,000.

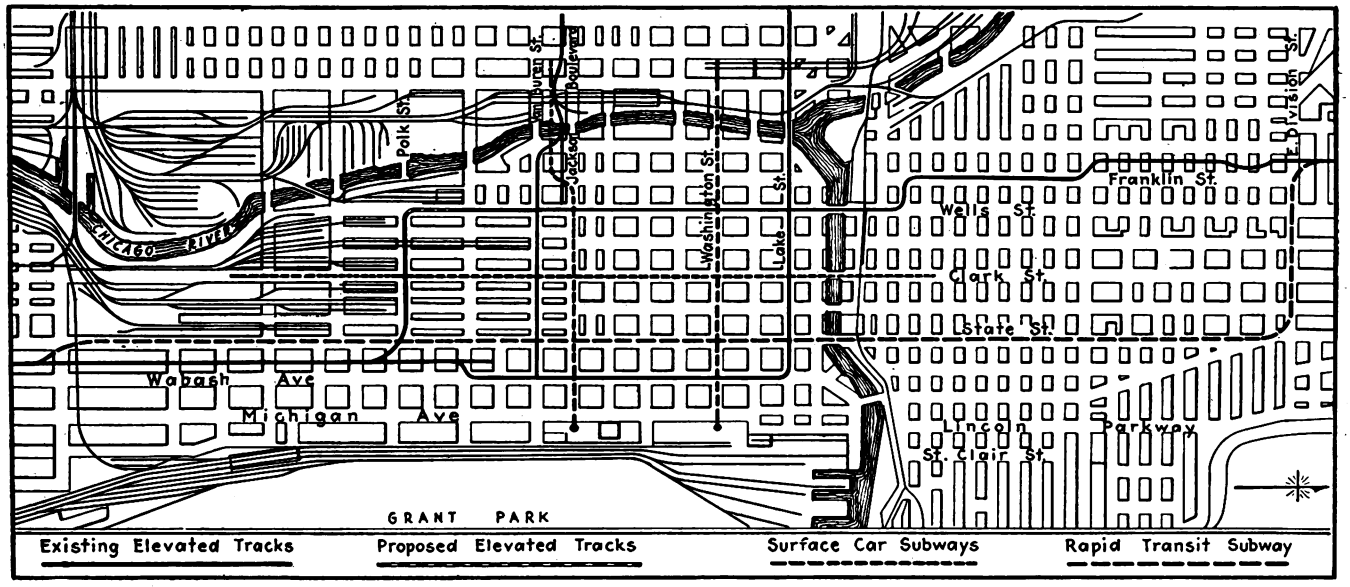
Stations for these surface-car subways would be located between State Street and Michigan Boulevard in both of the east and west tunnels. There would also be two transfer stations, each two blocks long, in the Clark Street subway, one at Jackson Boulevard and one at Washington Street, and each having an extension westward from Clark Street to Wells Street. There would be a through station on Clark Street at Harrison Street.

Rapid Transit Subway

The rapid transit subway would be constructed as a two-track low-level subway in State Street, so arranged that it can later be made a four-track subway. Owing to the limitations imposed by the location of the Illinois tunnel, the construction of this subway would necessarily involve taking care of the property of the utility companies now in the street. The engineers state that this can best be accomplished by locating the two tracks first constructed on one side of the street, preferably the west side, permitting the construction of the complete unit on the west side of the street including the utility gallery, and thus not preventing the building of the east tracks, with their utility galleries, when needed for a comprehensive subway system.

Stations of sufficient length to accommodate ten-car trains would be located at Twelfth Street, Harrison Street, Jackson Boulevard, Washington Street, Chicago Avenue and at Division and Clark Streets. The estimated cost of this subway is $16,000,000.

If the State Street subway is constructed as described, the engineer committee states that it could be best utilized in conjunction with the present elevated system, but that this would involve the construction of an extension of the elevated system in Wells Street from Van Buren Street to Polk Street, and then east to a connection with the main line of the South Side Elevated Railroad. This would involve an ex-



MAP SHOWING ROUTE OF SURFACE CARS AND RAPID TRANSIT SUBWAY LINES PROPOSED BY ENGINEERS TO CHICAGO COUNCIL COMMITTEE

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penditure of about $1,200,000, which should be furnished by the elevated railroad companies. Arrangements should be made at the same time for the elimination of the grade crossings on the elevated lines at Van Buren and Wells Street. This extension and grade separation, if built and operated in conjunction with the State Street subway, will double the track capactiy of the elevated lines serving the West Side.

The subway system as just described is so planned as to form the nucleus of and connect up with any one of the three comprehensive plans previously submitted to the local transportation committee, namely, the Arnold plan of 1911, the Harbor and Subway Commission Plan of 1913 and the Chicago Traction and Subway Commission plan of 1916. All of these systems provide for either the unification of existing transportation systems or the independent operation by the city of a comprehensive rapid transit subway.

A summary of the total cost of the initial subway scheme as recommended by the committee of engineers follows:

Washington Street Subway	$4,500,000
Jackson Boulevard Subway	4,900,000
Clark Street Subway	9,000,000
Total cost street car subways	$18,400,000
Rapid Transit Subway, State Street	16,000,000
Total estimated cost all subways	$34,400,000

These estimates are all for structures only, ready for the installation of tracks and equipment.

It is interesting to note that the amount of money in the city traction fund, as paid from the proceeds of surface lines operation, is now approximately equal to the total cost of these initial subways recommended by this committee of engineers.

Supplemental Report Suggests Another Subway

In addition to the matter appearing in the report of the committee of engineers as abstracted above, a supplemental report was also presented to the local transportation committee March 27, in which reference was made to the rapid growth of the district lying east of State Street and between the Chicago River and Lincoln Park. There has been much agitation for a subway to serve this district. With regard to this, the supplemental report states that special transportation, in the form of a subway for this district, while desirable from a municipal point of view and attractive from the standpoint of ease and low cost of construction, cannot, in common with the initial subways recommended, now be justified on the basis of earnings on the capital investment required.

Should the present development continue, however, even for a short period of time, transportation for the district should be provided, and probably by means of a subway connecting the outlying districts north and south and passing along the east margin of the city and following the suggestion contained in the Traction and Subway Commission's report of 1916. This subway would extent from a portal at about Eighteenth Street and Indiana Avenue, on the south, following Indiana Avenue, to Twelfth Street, thence north in the parkway east of Michigan Avenue, under the river to St. Clair Street, and thence swinging into North Michigan Avenue, at Chicago Avenue, up the parkway east of Lake Shore Drive and under Lincoln Park, with a portal located at North Avenue. This subway would connect with the Grant Park ends of the west side subways opposite Jackson Boulevard and Washington Street, thereby providing facilities for looping or rerouting cars from all parts of the city.

Columbia Increases Service

More Cars Being Run Under Police Protection—Arbitration Refused by South Carolina Company

There has been no recurrence of violence by strikers on the lines of the Columbia Railway, Gas & Electric Company since the early part of last week. The police continue to guard each car by a detail which follows in an automobile, but the number of policemen in each automobile has now been reduced from four or five to two. By March 28 twelve cars had been put in service, beginning operations at 7 a.m. and running to 7 p.m.

Efforts by the union to get somebody to arbitrate the trouble so far have been unsuccessful. Among those suggested have been the industrial relations committee of the Chamber of Commerce and an arbitration board to be appointed under the Gerald Arbitration Act, but the company has refused to submit what it conceives as its "business affairs" to arbitration, and if an effort is made to enforce the Gerald Act the company has declared that it will test its constitutionality. In a statement issued March 25 R. Beverley Herbert, attorney for the company, said in part:

> We wish to call the attention of the public to the fact that there was no dispute with the union or our former employees about wages or the hours of work. The union accepted the wage scale and hours we offered. The dispute was as to whether or not we would submit to arbitration the question of discharging an employee whose services were not satisfactory to the company. We think any one who will consider the matter will understand that we could not employ men and let them or any one else other than the company decide whether their services were satisfactory and whether we would continue to employ them.
>
> We have nothing against the former employees and are not opposed to unions or union labor. On the other hand, we have genuine sympathy for labor and for our former employees. When they went on a strike we put the cars in the barn and let them stay there a month, hoping that the men would come back to work and we then gave them every opportunity to come back to our employment before we employed other men. We tried to make them understand our position and to see that we were in earnest. We think they have failed to understand that either we will have to operate the street railway as a business concern or cease to run the cars at all. With us it is not a question of going back to the old contract. It is a question of running the street railway company without arbitration or going out of the street railway business.

Improvements Planned for Rochester Lines

An inclusive program of track reconstruction and service improvements for 1922 for the Rochester lines of the New York State Railways was recently outlined by Charles R. Barnes, commissioner of railways. The contemplated improvements will cost about $500,000. The plan provides for the installation of cross-town service in the northern part of the city, tapping the Clifford, Portland, Hudson, Joseph, Clinton Avenue, St. Paul, Lake Avenue, Dewey Avenue and Driving Park Avenue lines. The Dewey Avenue service will be extended from Ridge Road to Stone Road. Trackless trolley cars will be used on both the cross-town lines and the Dewey Avenue extension. The Clinton Avenue north line will be extended from the present terminus to Keeler Street, a distance of 1,750 ft.

Service will be extended on the Lyell Avenue line by utilizing the tracks of the Rochester, Lockport & Buffalo Railway. Owl-car service will be furnished soon on the Park and Dewey line.

Mr. Barnes' statement says that consideration is being given to the extension of service in Chili Avenue and Culver Road sections of the city by the installation of trackless trolleys.

A terminal building and loading platform will be erected at Ontario Beach Park in time for the summer travel.

In his statement itemizing the improvements Mr. Barnes says that extensions of service in the past have not kept pace with the growth in population and area of the city. He also said that it was the consensus of opinion among street railroad men of the country that on account of the cost of track construction supplemental city service could best be furnished by buses.

Commission Demands Further Improvements

In a letter to Franklin T. Griffith, president of the Portland Railway, Light & Power Company, Portland, Ore., the Public Service Commission demands that the company expend during 1922 the sum of $500,000 in maintenance, construction and reconstruction work. The letter stated that during the hearing held in February, 1920, and preceding the issuance of an order increasing car fares there had been filed with the commission certain expenditures in the amount of $819,950 necessary to the rehabilitation of the company's trackage layout. Further, that as of Dec. 31, 1921, there had been expended upon the items set out in the exhibit the sum of $386,470, with an additional $78,000 on track reconstruction. Expenditures during 1921, with maintenance added, will bring the total expenditures on reconstruction and maintenance somewhat in excess of $520,000. The letter states that the investigation convinces the commission that it can equitably require the expenditure of a sum of not less than $500,000 on maintenance and construction in 1922.

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Nashua Property Making Good Progress

The part electric railways play in the life of a community with some salient facts about this method of transportation as an industry was made the subject of an interesting and instructive talk fest recently at the Nashua, N. H. Country Club. The remarks were contributed by three well-known men in the railway industry, Edward Dana, general manager of the Boston Elevated Railway, W. H. Burke of the Stone & Webster management division, also of Boston and J. A. Queeney of the Railway Sales department of the General Electric Company, Schenectady, N. Y. Through the influence of E. W. Holst, engineer of the Nashua Street Railway, these three men were brought to Nashua.

Mr. Queeney took occasion to remark that under the two years' guidance of Mr. Holst the Nashua Street Railway had made rapid strides and that it was only a comparatively short time ago when the system was on the red ink side of the ledger. Some of the outstanding topics discussed at the recent Mid-Year Meeting of the American Electric Railway Association at Indianapolis, Ind., were referred to by Mr. Dana in his talk. He also gave some facts about the Boston Elevated Railway, commenting on its financial condition for the last year and declaring that it was on the principle that patrons of the road and not the general public should pay for the cost of their transportation, that the present board was operating reducing fare costs where practical. Mr. Burke gave some interesting statistics on the railway industry at the beginning of the inflation period and by means of a chart showed labor costs, revenues, etc. He said that the number of passengers had increased steadily on the average in recent years in a ratio of about 10 per cent.

Railway Unable to Perform Paving Work

President Wheelwright of the Virginia Railway & Power Company, Richmond, Va., has informed the Director of Public Works that owing to its serious financial condition his company will be unable to meet the franchise provision calling for an expenditure of $225,000 for paving and rebuilding of tracks. Accordingly Director Saville announced that the entire paving scheme for the year under the Roden bond issue would have to be revised.

In his letter expressing his regrets to Mr. Saville, Mr. Wheelwright said it was embarrassing for the management to have to take the position ostensibly of "laying down" since this procedure was far from its desire. In alluding to the company's financial condition he said that for the past year to Jan. 1 the company had failed to earn bond interest and taxes on the Richmond street railways by the sum of $297,057 and that for the past two months the situation had become acute. He said that the Council's failure to meet the urgent pleas of the company for relief in the matter of fares and franchises had been responsible for the railway situation in Richmond steadily growing worse.

Arbitration Board Deadlocked

No indication is forthcoming as to the prospects of a settlement of the Indiana, Columbus & Eastern traction line wage dispute by the arbitration board, which at present is deadlocked on the appointment of a third member. The line was a part of the Ohio Electric Railway before that system went into the hands of receivers. S. H. Hutchins, Columbus, Ohio, and C. W. Rich, Springfield, the two arbitrators, plan to hold a meeting soon in an effort to select the third man. Mr. Hutchins is also a member of the arbitration board which is attempting to solve the wage dispute between the company and its employees on the city lines in Lima, Ohio. The others on the Lima board are: C. A. Anderson, Lima attorney, and John Sweeney, Lima contractor. The old wage scale was 46 cents an hour. This is being continued pending settlement of the dispute. The company is proposing a reduction in the rate.

Investigation Made Into Serious Accident

An investigation is being made by Jerome Kuertz, Director of Street Railways, and officials of the Cincinnati (Ohio) Traction Company to determine the cause of an accident on one of the company's cars on March 24, which cost the life of a woman and injured nine other passengers. The accident occurred when a Clifton-Ludlow car got beyond control and slid down Clifton Avenue, one of the deepest grades in the city used for electric railway transportation, and crashed into a Vine-Burnet car.

Walter Draper, vice-president of the traction company, after viewing the scene of the accident and inspecting the car upon its arrival at the carhouse, said that the mishap was one of those things which could not be avoided, despite precautions. Both Mr. Draper and Commissioner Kuertz said that from all appearances both the motorman and conductor used every preventive to stop the car when it started on its runaway flight.

Condemns Radial Legislation

The Council of St. Catherines, Ont., unanimously indorsed a report of its special railway committee, in which hydro-radial legislation contemplated by the provincial government was condemned as prejudicial to the rights and vested interests of municipal corporations. The government was urged to take no further action toward nullifying previous hydro-radial enactments until a conference has been held between the government, the Hydro Electric Power Commission and the municipalities concerned.

News Notes

Association Formed.—An employees' association has been formed among the people employed by the Olean, Bradford & Salamanca Railway, Olean, N. Y. John Nutt, Olean, is president, assisted by an executive committee of eleven men.

Men Accept Present Scale. — Employees of the Scranton (Pa.) Railway have voted to renew their wage contract for another year. The agreement continues in effect until April 1, 1923. The company refused the men's request for an increase of 6 cents an hour.

Get Together Features Fun. — The Beaver Valley Traction Company, New Brighton, Pa., held a get-together of all employees and their families recently. In the language of the circus, the big show was at 7:30 p.m., but for late men a meeting was held at 1 p.m. At the evening gathering there were music, singing, monologues, readings, speeches, and other fun. A safety exhibit was a main feature of the evening.

Car Runs Down Hill.—The brakes of a Belt line car of the Public Service Railway failed to work on the up-grade on Newark Avenue, Jersey City, N. J., on March 28 and the car started down the hill, smashing into a loaded one-man Hudson line car. Twenty-four people suffered injuries. At the office of John F. O'Toole, assistant to the president of the Public Service Railway, it was said that it was not known just what the trouble was but that an investigation was being made.

Read "Service News."—In order to acquaint its employees with information about the company doings and other news the Savannah Electric & Power Company, Savannah, Ga., is publishing a monthly bulletin entitled *Service News*. The issues, distributed among the employees each month, contain some effective suggestions such as "Cultivate the feeling that the company wants to please its patrons," "Smilingly sell safe, satisfactory service" and "Kourtesy Kurtails Kicks."

Wages Reduced.—A reduction of 7 cents an hour in wages paid motormen was made April 1 by the Pine Bluff (Ark.) Company. Reductions will also be put into effect with all other employees of the railway department. The reduction was caused by a recent City Council ordinance requiring the company to reduce fares from 7 to 6 cents for cash fares. Motormen, who also serve as conductors, were paid 36 to 46 cents an hour. The new scale is 29 to 39 cents an hour. The motormen are on duty from ten to eleven hours each day, working seven days. This is the first reduction in wages made by the Pine Bluff company since 1918.

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Financial and Corporate

Interurban to Be Sold

One of Oldest Traction Companies Is Unable to Continue Selling of Service —Cars and Track Only Assets

The stroke of midnight on March 25 tolled the passing of one of Cincinnati's oldest traction companies, the Interurban Railway & Terminal Company, with its Cincinnati (Ohio) terminal on Sycamore Street. For many years now the traction company has fought a losing fight, steadily working always with the debit side outweighing the credit side. The discontinuance of the Interurban Railway & Terminal Company follows much litigation by bondholders of the company, who won their fight to have the road closed and the property sold to the highest bidder. A month ago the State Public Utilities Commission granted a committee of bondholders authority to abandon the line. The cars and rolling stock will be placed on the market and the tracks torn up and sold for scrap. The passing of the Interurban Railway & Terminal Company also marks the disappearance of electric railway transportation between Cincinnati and New Richmond and Cincinnati and Lebanon.

When the interurban boom of the late '90s reached its zenith a company was formed in 1898 called the Cincinnati & Eastern Electric Company. It built an interurban line to New Richmond. Then in 1899 another company was formed called the Suburban Traction Company. It built a line part way to Bethel, Ohio, through Mount Washington. Still another company, the Rapid Railway, built a traction line to Lebanon, Ohio. Finally, in November, 1902, these companies consolidated as the Interurban Railway & Terminal Company and elected George R. Scrugham, president. Associated with Mr. Scrugham were W. E. Hutton, Charles H. Davis, Leo H. Brooks, deceased; George H. Worthington and others.

Two disastrous fires are part of the history of the Interurban Railway & Terminal Company. One destroyed the Sycamore Street terminal, with a loss of $100,000, and the other destroyed the carhouse at Coney Island with a loss of nearly $75,000. The company's chief asset will be its track and rolling stock.

Brooklyn Company Rejects Commission's Valuation Invitation

The Brooklyn (N. Y.) City Railroad on March 27 made public a resolution adopted by its board of directors regarding the appraisal of the valuation bureau of the New York Transit Commission. The resolution, passed at a board meeting on March 17, followed a general discussion by the directors of an outline of the appraisal presented by Vice-President H. Hobart Porter.

The directors believe that for reasons they set forth in detail they are not justified in expending the large amount of money necessary to examine and analyze the valuations referred to in the letter of the commission of Feb. 23 and to prepare the detailed criticism and objections which are invited.

Improved Conditions Continue

The Muskegon Traction & Lighting Company, Muskegon, Mich., is keeping up the good work started in January. As a result of that month's operation the company actually showed net earnings, but after interest charges a deficit remains. In February there was a balance after interest charges amounting to $32.43. For two months the electric railway has been operating without bus competition and has shown that it can meet its expenses better when the bus, as competitor, has been removed. The company carried 338,659 passengers in February. The improved business conditions on this property were referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 11.

Deficit After Dividends

During 1921 the Omaha & Council Bluffs Street Railway, Omaha, Neb., carried 68,726,479 revenue passengers, as against 72,055,229 during 1920. Passengers carried on transfers: 1921, 18,907,734; 1920, 18,938,721.

The financial statements for 1921 and 1920 follow:

	1921	1920
Revenue from transportation	$4,262,852	$4,497,728
Other revenues	352,737	309,801
	$4,615,589	$4,807,529
Operating expenses	3,482,284	3,603,678
Net operating revenue	$1,133,305	$1,203,851
Taxes assignable to railway operations	437,620	427,862
Operating income	$695,685	$775,989
Plus non-operating income	38,966	29,914
Gross income	$734,651	$805,903
Total deductions from gross	637,457	637,490
Net income	$97,194	$168,414
Profit and loss adjustments	18,207	7,552
Adjusted net income	$78,986	$160,861
Preferred stock dividend requirements	200,000	20 ,000
Deficit	$121,013	$39,139

The total expenditure for additions and betterments during 1921 was $51,848, consisting mostly of costs of paving streets not previously improved and also laying heavier rails.

In its physical valuation reports now being considered by the Nebraska State Railway Commission for rate-making purposes, the company shows the following valuation totals for the system:

Four-year average, $21,740,254; 1919 reproduction, $25,126,177; present value (as of Sept. 1, 1919), $23,291,772.

Friendly Suit to Foreclose Commenced

Suit in foreclosure of a mortgage securing bonds amounting to $150,000 against the People's Traction Company, which operates the interurban line between Galesburg and Abingdon, Ill., has been filed by C. S. Harris in the Circuit Court, naming the Western Railways & Light Company, the People's Traction Company, the Galesburg Railway, Lighting & Power Company, and other companies concerned, as defendants. The suit is a friendly one, brought by the bondholders merely to protect their interest and speed up the negotiations for the exchange of securities now in progress.

The suit is brought in the name of the People's Trust & Savings Bank, Galesburg, trustee for the bondholders, two-thirds of the bondholders having made written request of the trustee to protect their interests by foreclosure of the mortgage.

All's Not Well in Radford

Electric railway service was suspended temporarily in Radford, Va., as a result of a controversy in which City Council, the Radford Water Power Company, which operates the street railway, and the jitneys are involved. Trouble began when a bus operator began carrying passengers between Radford and East Radford for 5 cents, after the railway had secured the approval of the City Council to put into effect a 7-cent fare. Accordingly the railway reduced its fare to 5 cents and the bus operator carried passengers for what they gave him. That evidently was the last straw or ride in this case as the car was put in the carhouse. It is stated that the jitney operator will be allowed to run his bus until his license expires in May.

Successor Company Organized at Lafayette

Articles of incorporation were filed with the Secretary of State on March 24 by the Lafayette (Ind.) Street Railway Company, Inc., the concern that is taking over the local lines at Lafayette, sold under foreclosure recently. The capital stock is $250,000 and Julius Berlovitz, Richard B. Sample, Charles L. Murdock, J. G. McKee and Allison E. Stuart are named as directors.

The directors have named the following officers: President, Julius Berlovitz; secretary, J. G. McKee; treasurer, Charles L. Murdock. Mr. McKee is a former traction line auditor, and was employed on the Murdock lines for several years. Mr. Murdock is the son of Charles M. Murdock, president of the First Merchants National Bank.

It was stated recently that a deed to the property recently purchased by the company will be issued April 1, and plans have already been made for the rehabilitation of the car lines. Engineers are now negotiating with various companies for rails, cars and other new equipment.

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London Outlook Cheerful

Chairman of Underground Railway Group Looks Forward to Gradual Improvement in Future

In the latter part of February there were issued the directors' reports and accounts for 1921 of the London "common fund" companies. These are the Metropolitan District Railway, London Electric Railway, the City & South London Railway, the Central London Railway, and the London General Omnibus Companies. Over all the companies had a specially successful year, largely owing to increased fares, and dividends—though nothing to boast about in an absolute sense—were exceptionally high. The ordinary stock of the District Railway got a dividend of 1 per cent—the first on this stock for many years.

The gross revenue for the year of the five companies was £13,085,557. Their revenue liabilities, namely working expenses, rent, rent charges, interest on loans, debentures, guaranteed and preference stocks, and reserves for depreciation and obsolescence, amounted to £12,176,285, leaving £909,272 for the common fund, to be distributed among the companies in percentages fixed by agreements. The Metropolitan District got £109,113, the London Electric £320,552, the City & South London £54,556, the Central London £104,483 and the London General Omnibus Company £260,568.

The accompanying tables show the working results for each company.

Lord Ashfield spent an arduous day in presiding and delivering his chairman's address at each of the five meetings of the companies in the London "combine." It was no wonder that he suggested that in future there should be a joint meeting, as many of his remarks are applicable to all the companies. In addressing the shareholders of the Metropolitan District Railway he said that if it had not been for the coal strike from April to June of last year and the subsequent trade depression, the results from the increased fares in London would have reached expectations.

The volume of traffic in London was a barometer measuring the country's prosperity. Lord Ashfield set out in detail the proposals he had made to the Government last autumn for relieving unemployment by carrying out the authorized developments of the underground system, if the Government would guarantee the new capital (as provided for in the Trade Facilities Act) and if the Government would secure the General Omnibus Company against piratical competition for ten years.

PARTICULARS OF PASSENGERS CARRIED, NUMBER OF CAR-MILES RUN, ETC., OF LONDON GROUP IN YEAR 1921 COMPARED WITH YEAR 1920

	Metropolitan District Railway		London Electric Railway		City & South London Railway		Central London Railway		London General Omnibus Company Limited		Total	
	1921	Increase+ or Decrease —	1921	Increase+ or Decrease —	1921	Increase+ or Decrease —	1921	Increase+ or Decrease —	1921	Increase+ or Decrease —	1921	Increase+ or Decrease —
Passengers carried—		(Estimated)										
Ordinary	80,122,744	—15,197,435	94,678,210	—18,025,516	21,824,780	—4,618,959	32,628,737	—6,700,236	761,251,405	—6,702,244	990,505,876	—51,244,390
Workmen	22,524,130	— 1,814,166	19,024,844	—13,921,312	7,390,284	—4,620,941	3,873,388	— 663,284	.....	.....	52,812,646	—21,019,703
Season..	27,666,850	— 374,015	19,317,850	+ 377,630	2,611,700	— 72,228	6,963,000	+ 508,760	.....	.....	56,559,400	+ 440,147
Total..	130,313,724	—17,385,616	133,020,904	—31,569,198	31,826,764	—9,312,128	43,465,125	—6,854,760	761,251,405	—6,702,244	1,099,877,922	—71,823,946
Number of car-miles run in relation to traffic receipts..	18,416,940	—1,145,551	24,727,829	—3,134,634	6,897,970	—493,839	7,728,525	—340,520	86,858,559	+1,015,467	144,629,823	—4,099,077
Mileage of lines owned (first track)...	M. Ch. 24 68	M. Ch.	M. Ch. 23 77	M. Ch.	M. Ch. 7 26	M. Ch.	M. Ch. 6 70	M. Ch.	M. Ch.	M. Ch.	M. Ch. 63 1	M. Ch. .. ..

COMPARATIVE STATEMENT OF THE OPERATIONS OF THE FIVE COMPANIES IN LONDON, PARTIES TO THE AGREEMENT AND SUPPLEMENTAL AGREEMENT MADE UNDER THE LONDON ELECTRIC RAILWAY COMPANIES' FACILITIES ACT (1915) YEAR 1921 COMPARED WITH YEAR 1920

Traffic receipts after the operation of the common fund under the terms of the London Electric Railway Companies' facilities act agreement, dated Dec. 21, 1915, and supplemental agreement, dated Dec. 8,	Metropolitan District Railway		London Electric Railway		City and South London Railway		Central London Railway		London General Omnibus Company Limited		Total	
	1921 £	Increase+ or Decrease— £	1921 £	Increase+ or Decrease— £	1921 £	Increase+ or Decrease— £	1921 £	Increase+ or Decrease— £	1921 £	Increase+ or Decrease— £	1921 £	Increase+ or Decrease— £
1921	1,849,581	.....	2,040,010	+223,091	446,999	+19,008	661,479	+83,096	7,500,572	+566,241	12,498,641	.....
Expenditure	1,351,208	.....	1,368,771	—18,523	301,441	—20,470	468,428	—16,704	6,936,082	+260,844	10,425,930	.....
Net receipts	498,373	+164,041	671,239	+241,614	145,558	+39,478	193,051	+99,800	564,490	+305,397	2,072,711	+850,330
Miscellaneous receipts (net)	164,180	—41,328	136,804	+ 1,868	34,309	+ 2,000	68,071	— 5,247	183,552	—64,376	586,916	—107,083
Net income	662,553	+122,713	808,043	+243,482	179,867	+41,478	261,122	+ 94,553	748,042	+241,021	2,659,627	+743,247
Interest, rentals and other fixed charges	326,760	— 611	295,544	+ 9,278	46,811	— 2,808	46,039	— 8,032	152,474	+ 43,890	867,628	+ 41,717
Balance	335,793	+123,324	512,499	+234,204	133,056	+44,286	215,083	+102,585	595,568	+197,131	1,791,999	+701,530
Reserve for contingencies and renewals	65,000	+ 20,000	65,000	+ 20,000	36,000	+11,000	29,000	+ 9,000	335,000	+ 50,000	530,000	+110,000
Balance	270,793	+103,324	447,499	+214,204	97,056	+33,286	186,083	+ 93,585	260,568	+147,131	1,261,999	+591,530
Dividends on guaranteed and preference stock	198,430	+ 29,400	126,947	.....	42,500	.....	21,600	.....	.....	.....	389,477	+ 29,400
Balance	72,363	+ 73,924	320,552	+214,204	54,556	+33,286	164,483	+ 93,585	260,568	+147,131	872,522	+562,130
Add balances from last year's accounts	20,537	— 1,561	22,350	+ 1,408	18,820	— 930	15,161	+ 3,399	58,843	— 883	135,711	+ 1,433
Total amount available for dividends and further reserves	92,900	+ 72,363	342,902	+215,612	73,376	+32,356	179,644	+ 96,984	319,411	+146,248	1,008,233	+563,563
Dividends on ordinary stocks and shares	32,350	+ 32,350	303,158	+ 198,219	48,100	+25,900	120,000	+ 52,500	251,483	+137,163	755,091	+446,132
Rate per cent	1%	+ 1%	3¼%	+ 2¼%	3¼%	+ 1¾%	4%	+ 1¼%	8% (Free of tax)	+ 3% (Free of tax)	3.92%	+ 2.26%
Balances carried forward to next year's accounts	60,550	+ 40,013	39,744	+ 17,393	25,276	+ 6,456	59,644	+ 44,484	67,928	+ 9,085	253,142	+117,431

Note—In consequence of the Government control of the Metropolitan District Railway in 1920, the traffic receipts and expenditures for that year are not comparable with those for the year 1921 and are omitted. In the previous year the receipts included £705,347 received as Government compensation.

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As the Government declined to agree, a revised scheme had been sent in, and he hoped it would be accepted. Meantime the nature of it could not be disclosed. Expenditure on capital account of £707,000 had been incurred during the year for new rolling stock. In spite of current prices being at the maximum, it was impossible to refrain from ordering new cars, in view of the congestion of traffic. The price was 275 per cent above the pre-war price. To help to meet the cost a temporary loan of £400,000 was obtained from the company's bankers. New overhaul shops for all underground railways were being built at Acton at an estimated cost of £350,000.

Fall in Wages

In regard to the fact that a dividend (1 per cent) was being declared on the ordinary stock of the company (which very rarely receives any dividend) he said that it was practically paid out of the proceeds of the second half of the year, and arose largely from the distribution of the common fund of the associated companies having been revised as from July 1, 1921. In general, he considered the results for the year extremely satisfactory. This was the first time since 1882 that the company had declared a dividend on its ordinary stock and on that occasion the distribution was only three-sixteenths per cent. He had reason to hope that it would be possible gradually to increase the dividend in future years.

At the meeting of the London Electric Railway, Lord Ashfield, referring to the reductions in wages under the sliding scale as cost of living fell, said that the reductions in wages during 1921 meant a saving of £240,000 to the four associated railways. As for the fall in prices of materials, it occurred rather late in last year, and as the associated companies carried large stocks the benefit from the fall has hardly accrued. The average price of coal last year was 52s. 6d. per ton. For the current year to date the cost was less than 32s. 6d. per ton. The one factor which prejudiced the situation was a heavy falling off in the volume of traffic. However, the economies that could now be counted on would appear sufficient to maintain the companies in their present position, so that when the revival came, the companies should occupy a strong position.

An Unprofitable Extension

At the Central London Railway meeting Lord Ashfield said that 1921 was the first year during which the extension railway from Shepherd's Bush to Ealing had been continuously worked. Under an agreement with the Great Western Railway that company maintained the railway and worked the train service. For doing this the company received a share of the traffic receipts. This share had barely been sufficient to meet the expenses, and the results were very disappointing. The number of passengers carried during the year was about 3,200,000, while the number of passengers using the Ealing stations and the Metropolitan District Railway was more than 9,000,000. The discrepancy was due to the higher fares on the new route. The rates in vogue there were necessitated by the fact that the new railway was a part of the Great Western Railway, on which the fares were 75 per cent in advance of the pre-war rate. Negotiations were in progress for an adjustment of fares.

Bigger Tunnels Needed

At the City & South London Railway meeting, Lord Ashfield said the conditions had not been favorable for the company making a start for the reconstruction of the railway (particularly for enlarging the tunnels which are smaller than those on the other and more modern tube railways). The number of passengers for the year showed a decline of 23 per cent and the drop was more severe than in the case of any of the other railways in the group. It was hoped that an application for guarantee of additional capital by the Government under the Trade Facilities Act would be obtained. In looking to the future, he saw no reason why the position of the company should not improve.

The brief abstract just given indicates that with reviving trade and a maintenance of present fares until circumstances justify their reduction the underground companies should do fairly well.

More Rolling Stock Purchased Under Equipment Trust Plan

Putnam & Company, Hartford, Conn., are offering for subscription $171,000 of Connecticut Company equipment trust 5 per cent gold notes Series E. The trustee of the issue is the Security Trust Company, Hartford. The notes are dated April 1, 1922, and will mature in twenty semi-annual installments. They were offered at prices to yield about 5.35 per cent.

These notes are a direct obligation of the Connecticut Company under an equipment trust agreement between it and the Security Trust Company of Hartford, Conn., trustee. The title to the equipment under this agreement remains with the trustee until both principal and interest of all notes shall have been paid in full.

The total cost of the equipment is $229,000, of which 25 per cent, or $58,000 will be paid in cash. The notes therefore represent 75 per cent of the purchase price. The equipment consists of thirty-five standard 28 ft. single-truck steel safety cars with air-brakes and two 25 h.p. motors, each car having a seating capacity of thirty-two passengers, and three 40 ft. double-truck steel safety cars with air-brakes and four 25 h.p. motors, each seating fifty-two passengers. These cars are of the most modern design and construction. The double-truck safety cars are in use on the line between Torrington and Winsted, 12 miles distant. They were described in the ELECTRIC RAILWAY JOURNAL of Feb. 18, page 276.

Previous issues of the equipment notes were as follows:

Series A	Dated Oct. 15, 1915
Series B	" Sept. 15, 1916
Series C	" Jan. 15, 1920
Series D	" May 15, 1920

Of these Series A and B have been paid in full, while of Series C $45,000 has matured and been paid and of Series D $26,000 has matured and been paid.

The bankers point out that the company paid about $850,000 of these notes during the worst period of electric traction business, and that cash to meet these maturities has always been deposited with the trustee in advance of the due date. It is also explained that on July 15, 1922, there will be due from the company to the State of Connecticut about $778,000, of which $363,000 covers funded tax obligations, and $415,000 is on account of current taxes. To meet these payments the company has a cash reserve of $650,000. The balance is to be provided for during the next three months.

Financial News Notes

Loss Continues.—Filing of the regular monthly report for February of the operations of the Springfield (Ohio) Street Railway with the city manager, on March 25, reveals that the company has made no financial improvement over the month of January. A loss of $4,579 was sustained in February, as compared to a loss of $5,704 for January.

Property Sold.—Property of the Conway Street Railway, extending from Conway, Mass., to South River, on the Fitchburg line, a distance of 7 miles, operation of which ceased some time ago, has been sold to H. Jacob & Son, junk dealers, North Adams. The dealers said they would try to resell it as it stands.

Nueces Company Reorganizes.—The Nueces Railway, Corpus Christi, Tex., which owns and operates the street car lines of that city, has been organized with a capital stock of $10,000. Incorporators are R. W. Morrison, E. H. Eldridge and E. R. Kleberg. The trolley lines in Corpus Christi have not been operated since the fire destroyed the power plant several weeks ago. The power plant is being rebuilt.

Surplus of $656,226.—The West Penn Traction & Water Power Company, Pittsburgh, Pa., and its subsidiaries report gross earnings for the year ended Dec. 31, 1921, of $14,189,776, an increase of $581,827 over the earnings a year ago. The operating expenses decreased nearly $6,000. The net income increased from $1,256,495 in 1920 to $1,464,508 in 1921. After deducting preferred dividends amounting to $808,282 a surplus remained of $656,226.

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Traffic and Transportation

Fares Reduced on Some Eastern Massachusetts Divisions

Fare reductions and zone extensions will go into effect on April 21 in the Lynn, Salem, Lawrence and Brockton districts of the Eastern Massachusetts Street Railway.

The trustees say that the Salem, Brockton, Lawrence and Lynn districts have been making the best financial showing during the past few months and in accordance with the service-at-cost plan under which the road is operating they are entitled to the lower fares.

In the Lawrence district, tickets will be sold at the rate of seventeen rides for 95 cents; in Salem at the rate of seventeen rides for $1, and in Lynn at the rate of nineteen rides for $1 or 5½ cents a ride.

A twelve ride $1 ticket will be issued in Methuen and other outlying towns in the Lawrence district, where the only fare now is 10 cents cash. In the Brockton district, a fourteen ride, $1 zone ticket to surrounding towns is increased to fifteen rides. The city zone ticket remains good for seventeen rides for $1.

Lower Fares Issue of Election

Immediate action for lower fares at Hartford, Conn., is among the items in the platform of the Democratic party for the municipal election that will take place on April 4. Richard J. Kinsella, Democratic nominee for Mayor, says, if elected, he will favor and insist upon a reduction of 25 per cent, or four fares for 25 cents instead of three, the present scale. The salient features of his platform are:

1. Reduce fares at once to four fares for a quarter.
2. Have Hartford division separated from state system as a unit for computing operating costs and receipts.
3. Decrease overhead by curtailing suburban trolley service during "hollow" hours of the day and night.
4. Maintain receipts in Hartford by improved service during rush hours and by increased number of passengers due to lower fares.

It is argued that the Republican administration has opposed action looking toward lower fares in Hartford. Decreasing the overhead expense, the Democratic nominee declares, would not work a hardship on the trolley system financially.

Pass Plan in Effect

The Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, has installed the monthly personal pass to give a reduced rate to regular riders. The line runs from the business district of Cedar Rapids to the suburb of Kenwood, thence to Marion City, a distance of 6 miles. A one-way cash fare is 18 cents, but books containing ten tickets are sold for $1.50. Under the pass plan a person who pays $1 a month will be entitled to ride at 10 cents per ride. Thus, if he rides twice each working day, or fifty times a month, his fare will be 12 cents instead of 18 cents. The plan went into effect on March 15.

Misunderstandings Cleared Up

Virtually all points of difference between the California State Railroad Commission and the Los Angeles Board of Public Utilities were settled on March 22 at a conference of members of the two bodies, it was announced by representatives of each, and assurances were given that closer co-operation between the commission and the board would follow.

Friendly suits, as previously requested by the Railroad Commission in a letter to the board, to test the question of jurisdiction over utilities in Los Angeles will be instituted either by the Railroad Commission or by the Board of Public Utilities, according to J. D. Kennedy of the utilities board, who stated that the conference held in the office of President Brundige of the commission "has resulted in a closer relationship and a far better understanding of our respective functions."

The first of these suits is expected to follow a decision by the Railroad Commission on a petition from the Hollywood Board of Trade asking that the Los Angeles Railway Corporation be required to extend five of its lines into the Hollywood district to compete with the Pacific Electric lines, which serve Hollywood exclusively. The Los Angeles Railway lines have a 5-cent fare and the Hollywood Board of Trade petitioned this service in face of the 10-cent fare charged by the Pacific Electric Railway, and as granted by the Railroad Commission in its decision of Dec. 24, 1921, for increased fares on the various lines of the Pacific Electric Railway.

The attorney for the Hollywood Board of Trade at the rehearing of the Pacific Electric Hollywood rate case, held on March 20, 21, 22 and 23, set forth that the commission has the authority to order the Los Angeles Railway to extend its lines into Hollywood, while opposing counsel of the Los Angeles Railway set forth certain arguments and court rulings that neither the State Railroad Commission nor Los Angeles Board of Public Utilities had the authority or legal power to order these line extensions. Ex-commissioner Edgerton and former president of the State Railroad Commission represented the Los Angeles Railway Corporation as special counsel in arguing against the petition of the Hollywood Board of Trade to the commission to order these extensions of lines.

Reduction in Round-Trip Tickets Announced

New tariffs have been filed with the Public Service Commission by the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., providing for reduced rates to Clinton, Brazil, Paris, Sullivan and other points. When asked about the reduction, General Manager E. W. Walker said that it was the intention of the traction company to meet the desire of the people for cheaper transportation by putting into effect greatly reduced round-trip rates. He said in part:

> The company has been catering to the transportation needs of Terre Haute and vicinity for very nearly a half century; it will celebrate its fiftieth anniversary in 1926. Its stockholders have invested millions of dollars in building up a plant and equipment, and it has never expected to make any money other than by legitimately meeting the needs of the community for transportation, and doing this at a price which would stimulate the freest use of the facilities provided. Its investment is a fixed investment, and it has no opportunity during dull times to pull up stakes and move to another place.
>
> Looking back over the last few years, during which we have heard so much about the high cost of living, it will be remembered that only in the case of interurban fares has the Traction company at Terre Haute contributed to this high cost of living. These fares were increased by general order of the Public Service Commission at the time fares and charges were being increased by the federal government on the steam railroads. Its fare on the city street car lines is the same now as it was in 1866, and has never been higher.

Mr. Walker said that the reduced rates were voluntary on the part of the company and would become effective on March 28.

Railway Is Entitled to Higher Rate

H. F. Dicke, general manager of the Utah Light & Traction, Salt Lake City, Utah, in answer to a petition of Charles Anderson and others seeking a return to the old 5-cent fare schedule states that his company is entitled to higher fare and if the Anderson petition is pressed, he will solicit the commission for such fare increase. In his opinion instead of decreasing the rate of fare the company is entitled to an 8-cent cash rate with tickets selling for 7½ cents. He states that he is not asking for this rate at this time but reserves the right to file petition for such increase if the case proceeds to a hearing.

In the company's affirmative defense, additional investments are said to have raised the valuation of the company's property from the $8,468,278, fixed by the utilities commission Jan. 15, 1920, to $8,721,485 at the first of the present year. Operating costs in 1919 are said to have been $1,395,752, in 1920 $1,634,008, and in 1921, $1,747,253. At the same time the number of revenue passengers increased from 33,908,484 in 1919 to 34,710,922 in 1920 and then dropped off to 31,135,305 in 1921, while decreases are again shown for the present year of 236,257 in January, 213,019 in February and 79,660 in the first half of March. Unless a change comes, it is predicted, the company may not expect more than 30,000,000 revenue passengers for 1922.

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Interstate Act Interpreted

Court Issues Temporary Injunction in Which Jurisdiction of I. C. C. Over Electric Lines Is Denied

Ordinarily the electric railway engaged in interstate commerce does not come under the jurisdiction of the Interstate Commerce Commission. In order to do so the electric railway must be operated as a part or parts of a general steam railroad system of transportation, must be engaged in the general business of transporting freight in addition to its passenger and express business, or it must be operated as part of a general steam railroad system of transportation or be engaged in the general transportation of freight. If a road is not thus engaged or being thus operated it is not within the Interstate Commerce Act nor within the jurisdiction conferred on the Interstate Commerce Commission, even though the road may be engaged in interstate passenger business.

This, in short, is the ruling just made by Circuit Judge Donahue and District Judges Killits and Westenhaver in the District Court of the United States for the Northern District of Ohio, Eastern Division, in the case of the village of Hubbard against the United States of America, the Interstate Commerce Commission and the Pennsylvania-Ohio Power & Light Company. To the court it seemed that the interpretation just mentioned was the only proper one and the effect of several amendments to the Interstate Commerce Act made since the decision in the so-called Omaha Street Railway case.

With respect to the general principles governing the matter the court says:

> The establishment of the Labor Board to settle controversies between carriers and employees, the guaranty for a limited period of a fixed return upon railroads, the grouping of railroads into classes and requiring rates to be fixed so as to allow a fair return to be earned on the property as a whole, the control assumed and exercised over the construction of new railroads, and the making of extensions and the issuance and sale of securities, are all parts of a general scheme from which all street or interurban electric railways are excluded unless possessing these characteristics.

With respect to the line of the Pennsylvania-Ohio Electric Company the court says that "plainly and admittedly the defendant railway was not operated as a part of a general system of steam railroads for transportation." After referring to the fact that the freight service of the company appeared to consist of packages and parcels and that this service was more nearly like what is called express than freight traffic, such an incidental and relatively insignificant and unimportant freight business could not be called the general transportation of freight in addition to the company's express business. The conclusion of the court was to the effect that the order of the Interstate Commerce Commission was in excess of any power and jurisdiction conferred upon it by the Interstate Commerce Act and that the order of that body assuming jurisdiction is void and without effect. In consequence the court signified that "the motion to dismiss will be denied and a preliminary injunction will be granted as prayed."

The court also ruled that in the case of the South Covington & Cincinnati Street Railway, cited by the defendant, the decision was wholly inapplicable and dealt with entirely different questions.

The Interstate Commerce Commission decided last fall that the franchise contract entered into between the predecessor of the Pennsylvania-Ohio Power & Light Company and the village of Hubbard, Ohio, fixing the rates between Youngstown and Hubbard was without effect where the rates so fixed resulted in unjust discrimination against interstate commerce. In consequence the Youngstown company was ordered by the commission to increase its rates by putting into effect upon five days notice a one-way cash fare of not less than 20 cents between Youngstown and Hubbard, and a commutation rate of not less than $5 for fifty-four rides. In the words of the commission the company was directed "to cease and desist from practicing the undue prejudice, undue preference and advantage found to exist in the relation of intrastate to interstate passenger fares." The decision of the Interstate Commerce Commission was reviewed in the ELECTRIC RAILWAY JOURNAL for Dec. 17, 1921, page 1091.

Transportation News Notes

Fares Reduced.—Fares on the lines of the Pine Bluff (Ark.) Company were reduced 1 cent on March 22, the reduction being from 7 to 6 cents for cash fares. Five-cent fares may be secured by purchasing books of fifty tickets. An effort is also being made to secure 5-cent fares for school children. This reduction came as a result of an ordinance passed at a recent meeting of the City Council.

Freight Rates Cut.—Freight rate reductions were announced on March 15 by the Cincinnati & Dayton Traction Company to Detroit and other Michigan points on the same basis as steam railroads. Officials of the traction company in announcing the reduction said that the company would make second day delivery to Detroit and about three-day delivery to other Michigan cities. This reduction, it was stated, is effective not only in Detroit, but to points on other railways.

Getting Used to Tokens.—Since the Connecticut Company, New Haven, Conn., placed tokens on sale for transportation there has been a slight increase in travel on the company's lines in the Hartford Division. Manager Scott said that an increase was expected and that a gain, though trifling, was noticeable. Those who are regular commuters on trolleys are now becoming accustomed to the purchase of tokens, although trolley men say it is surprising how many continue to pay the full 10-cent fare.

A Tower Will Guide You.—Baltimore, Md., has become a City of Towers. To expedite the traffic this new device was recently put into service at Charles Street and North Avenue. When you are to move your vehicle a green light will be flashed, and a red light will warn you to stop. There is still another guide for you—watch the amber light. It indicates that a change is to be made. The tower at Charles Street and North Avenue is equipped with a siren which is sounded on the approach of fire engines.

Rehearing Denied.—Application by the city and county of Denver for rehearing of the rate case of the receiver of the Denver (Col.) Tramway has been denied by the United States Circuit Court of Appeals. The Appellate Court on Dec. 29, 1921, rendered an order sustaining the findings of the Federal District Court, which is the authority for the collection of the present rates of fare, and upholding the contention of the receiver that the franchise under which the company is operating is not a contract in so far as the rate of fare of 5 cents stipulated therein is concerned.

Commutation Tickets Reasonable.—The Public Service Commission of Pennsylvania dismissed the complaint of the patrons of the Pittsburgh, Harmony, Butler & New Castle Company, against the rates charged by the company. The commission found from the evidence submitted that the commutation ticket rates were reasonable and not discriminatory as compared with the cash fare rates. The company has established a zone basis of fares, with a minimum charge of 6 cents for each passenger. The zone rate is an average of 2.98 cents per mile. Tickets are sold in groups of forty-four and sixty, good on any part of the line. The charges are made upon the principle that the shorter the commutation distance, the larger the rate as compared with flat fares.

Wants Jitneys Prohibited.—Electric railway service in North Little (Ark.) is threatened with discontinuance if the City Council fails to pass an ordinance prohibiting "jitneys" from running parallel with the car tracks within a distance of three blocks from the car route, and granting the company the exclusive right of operating buses on certain streets within the city limits. This is the ultimatum delivered by P. C. Warren, manager of the Inter-City Terminal Railway. He stated that the company lost $2,240 during the month of February. D. H. Cantrell, president of the Little Rock Railway & Electric Company, represented the Inter-City Terminal Company at a recent City Council meeting. The matter will be taken up later and definitely decided.

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Personal Mention

Frank H. Warren, Editor

Indianian With Keen Sense of the Verities Put Into Job Fitting His Natural Talents

Two events stand out like Mars at perihelion in the life of Frank H. Warren, claim agent of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind. The most important event of his life, of course, occurred on Jan. 8, 1878, when he was introduced to the world about 20 miles east of the Indianapolis Street Railway. The next important event came almost forty-four years later to the day, when Mr. Warren received a check from the ELECTRIC RAILWAY JOURNAL for an article on salesmanship. The first event is of course a little hazy in Mr. Warren's mind, but he is dead sure that his celebration of the second event completely out-classed that of the first. In comparison with these two peaks, everything that happened in between sinks into insignificance.

FROM MAIL CLERK TO EDITOR

This is Mr. Warren's own estimate. Another event took place in his career, however, which others are inclined to think stands second only to the memorable event of 1878. It occurred a few days ago when Mr. Warren had thrust upon him the editorship of the *Safety Valve*, a real magazine for the employees of the company, the first issue dated February, 1922. Ever since 1878 Mr. Warren has been headed editorward, but he didn't realize it until R. R. Smith, vice-president and general manager of the company, and other officers broke the news to him that he had been appointed editor of the company's new house organ.

It is said that all good men and true have either taught school or sold books. Mr. Warren confesses to having done both. In the course of that work he took a few vacations at normal schools and a university, along with some outside efforts, and finally succeeded in persuading Indiana University to give him two years credits. His education ended right there. He then took a correspondence course in which he learned about all the railroads in the world, later passed the examination for railway mail clerk, and went to work.

AN EXPERT ON NAMES

After learning the names of all post offices in that small section of the country west of the Alleghanies, Mr. Warren looked around for more worlds to conquer and seized on law as the most helpless victim. It took him just one year in a law office to master that subject, and then he became interested in claim work through an accident in the family. To Mr. Warren it looked like a pretty soft job. Throwing all possible safeguards about his effort to get a job, Mr. Warren went to Elmer Slick of the Union Traction Company of Indiana and suggested to him that he would be a winner in Mr. Slick's department. This was slick work, of course, but after slinging mail for Uncle Sam all day and at the same time doing odd jobs for Elmer, Mr. Warren abandoned Uncle Sam to his fate in order formally to hook up with the Indiana Union. He put in about five years with that company as assistant claim agent, and then spent about a year with the Interstate Public Service Company as safety agent. He then took a hand at selling, but what he really learned there was the wonderful stabilizing force of a salary. Then, Mr. Warren landed in the New York office of the Globe Indemnity Corporation and spent three months inquiring his way about in the Bronx and Brooklyn. It was about this time that Mr. Smith, general manager of the South Bend line, rescued Mr. Warren from his almost aimless wanderings and took him back to his Indiana home among the cornfields.

Claus Spreckels, New Manager at San Diego, Reviews Plans

Successor to Mr. Clayton at San Diego Not in Sympathy With California Association in Opposing Publication of "Bus Transportation"—Prepared to Use Buses in San Diego

CLAUS SPRECKELS, the new general manager of the San Diego (Cal.) Electric Railway, chosen at the last annual meeting of the company, "grew up in the business," it might be said, as all of his business life has been spent in the employ of the company. He began service at the age of twenty years as a bookkeeper, in 1911 was elected secretary and treasurer of the company, and the next upward step made him general manager. He has succeeded William Clayton, who had been managing director of the company for twenty-one years.

Mr. Spreckels was born in San Francisco in 1888, and received his education in the public schools of that city. He is the son of John D. Spreckels, president of the San Diego Electric Railway and of the Arizona & San Diego Railway. Claus Spreckels looks on things in a practical light, and hence refused a chance for a college education and started work for the electric railway instead, so that he could "learn the business from the ground up."

LEARNING FROM THE GROUND UP

"I couldn't see where a knowledge of the classics would help me run the electric railway," he said, "and that is what I wanted most to do. Practical experience looked to me like a more sensible way to attain my object, so I got on the payroll and worked up, acquiring such technical knowledge as I needed by my own efforts."

Mr. Spreckels said there would be no radical change of policy in the company due to his selection as manager. His aim will be to give the best possible service with the revenue provided, but to eliminate lines that do not pay their way and substitute less costly service. In this connection he expressed a strong liking for the motor bus, or "motor street car," as he prefers to call it.

"I think the motor street car is bound to develop into the logical solution of the transportation problem for districts where the traffic is not heavy enough to warrant building a trolley line," he said. "And as far as San Diego is concerned, we intend to meet all the needs for transportation. We are here to furnish transportation and we will do it.

"BUS TRANSPORTATION" MEETS REAL NEED

"And while on that subject, I want to say that I am not in sympathy with the position of the California association in opposing publication of BUS TRANSPORTATION by the McGraw-Hill Company. I think the new publication meets a need and furnishes transportation men all the latest developments in this latest means of transportation."

The new general manager got right into the middle of things when he took charge of the affairs of the company, and one of the first things he did was to announce a plan whereby the Adams Avenue line would be discontinued and replaced by a bus line. The residence suburbs of Normal Heights and Kensington Park, which are outside the city, are served by the Adams Avenue line, which was also within the city limits. The City Council gave approval to the plan subject to a satisfactory arrangement of details. However, residents of the two suburbs have entered vigorous protest against discontinuance of the electric trolley, and plans for the bus service have been temporarily halted to give the residents time to see if they can work out a plan they have proposed.

CITIZENS MUST PAY FOR PAVING

The company has agreed to consider a proposal to retain the trolley line on condition that residents relieve the company of all paving costs and to supply enough funds to the company to pay half of the cost of rebuilding the Adams Avenue line. This is esti-

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mated at $190,000, and the paving, it is estimated, will cost $70,000. Thus it will be necessary for those wishing to retain the trolley service to raise $165,000. It is proposed to issue stock in the railway company to the subscribers to the fund for rehabilitating the line.

Citizens active in the movement to retain street car service have estimated that between $5,000,000 and $6,000,000 is represented in the real estate investments dependent on the Adams Avenue line for transporation, and assert they can well afford to advance this sum rather than allow the company to tear up its tracks and put on motor buses.

The Adams Avenue line has a total of 2.35 miles. The present roadbed and track is in such bad shape that repairs are useless, owing to the nature of the ground, and reconstruction is imperative if cars are to continue in operation. Reconstruction, if undertaken, will be of the highest type track, with twin steel ties imbedded in concrete, the same as was used in reconstructing the Broadway line downtown a few months ago. Manager Spreckels stated that this type of work would be used for all reconstruction henceforth in San Diego.

A citizens' transportation commission, appointed by Mayor John Bacon shortly after his election last fall, and consisting of Stephen Bjornson, chairman; H. F. Worth, secretary, and James H. App, in a preliminary report to the City Council recommended that the company be allowed to substitute motor buses operating on Madison Avenue for the Adams Avenue line, and the City Council has given tentative consent.

Bus Service May Be Started

Unless an agreement is reached with the citizens who are endeavoring to retain the trolley car service, Manager Spreckels announces, the bus service will be instituted. A bus has already been designed for the purpose, following the plans of Manager Spreckels, and a model of the car has been run over the proposed route. On the trial trip the full length of the Adams Avenue line was made in 12 minutes, including ten stops for discharging and receiving passengers. A 20-minute headway is maintained on the trolley line.

Other officers elected at the annual meeting of the San Diego Electric Railway Company were: John D. Spreckels, president; William Clayton, vice-president; Fred Whitehead, secretary; Read G. Dilworth, treasurer.

The same set of officers also was elected at the same time to occupy the same positions respectively in the Point Loma Electric Railway Company and the San Diego & Colorado Ferries Company.

William Clayton, retiring as managing head of the San Diego Electric Railway Company after twenty-one years of service, retired from the management in order to be relieved of some of the active work, it was stated at his office. He recently celebrated his sixty-third birthday and feels he is entitled to a rest. Besides his duties as vice-president of the San Diego Electric Railway Company, Mr. Clayton retains executive control over some other of the Spreckels interests in San Diego, so has enough to do to keep him comfortably occupied. Claus Spreckels was his natural successor in the executive chair, as the young man will some day be called on to look after all of his father's large interests, and the management of the electric railway was considered the logical starting point.

Mr. Clayton is rather proud of his record of twenty-one years as executive of the San Diego Electric Railway with never a strike nor labor trouble of any kind, nor of any serious friction with the San Diego public.

Major Smith to Assist President

On the double quick Major Earl H. Smith has marched into two important executive positions. Though he is just

E. H. SMITH

forty-two and thus scarcely old enough to have more than handled one big job, Major Smith has mastered one and is well started on his second. For Major Smith is not only editor of the Fairmont *Times*, Fairmont, W. Va., a paper which he founded, but he is now tackling the job of acting as assistant to the president of the Monongahela Power & Railway Company. He will direct the public relations of the company, and have charge of publicity.

Though his new position is somewhat removed from his previous work, in reality Major Smith has simply exchanged the game of marbles for the game of discovering the public, for he has known the men who promoted the traction company since they hooked rides, cookies and holidays together.

Since leaving college Mr. Smith has spent most of his life in the newspaper game, and some time ago founded the Fairmont *Times*. He served in France during the European War, and upon his return assisted President Alexander in an informal way. He now becomes formally associated with the company.

Obituary

E. H. Ives

Edward H. Ives, assistant general superintendent of the Detroit (Mich.) United Railway, died on March 19 as a result of injuries received when an interurban train of the Detroit United Company struck the automobile which he was driving. His wife, three children and a friend were also killed.

Mr. Ives, with his family, was on the way to Capac, when the car skidded on the ice-covered highway a mile south of Rochester, Mich., directly in front of the interurban train. One daughter jumped from the machine and was uninjured. These facts were ascertained since the publication of the item about Mr. Ives in the issue of last week.

Mr. Ives had been connected with the Detroit United Railway for twenty-six years. He had worked up to his position of assistant general superintendent from carhouse boy. He was promoted to the office of assistant division superintendent and superintendent, and before his last position was assistant schedule chief and later second assistant general superintendent.

Mr. Ives has been popular with the company and with city officials. The city hoped to keep him when the Municipal Railway and the Detroit United lines were combined.

John A. Hurley, retired manufacturer of Bridgeport, Conn., died at his home in that city March 20. Mr. Hurley was born in New Haven, April 30, 1854. When young he removed to Meriden, Conn., where he became vice-president of the Connecticut Breweries Company. While in Meriden he built the electric railway from that city to Lake Compounce, known as the Meriden, Southington & Lake Compounce Street Railway. Mr. Hurley was later associated with the Hurwood Manufacturing Company, and more recently was engaged in the insurance business.

Walter G. Oakman, noted financier and railroad builder, died on March 18 in New York, N. Y. He was in his seventy-seventh year. Mr. Oakman was best known to New Yorkers as president of the Hudson Companies, which financed the tunnel system that links New York City with New Jersey. He had also been interested in the Interborough and the Brooklyn Rapid Transit companies. He was graduated from the University of Pennsylvania in 1864, leaving college to join the Union armies and fight in the closing months of the Civil War. Later he entered the railway field, and became division superintendent of the Delaware, Lackawanna & Western Railroad. He was a director of the Brooklyn Rapid Transit Company, Brooklyn Heights Railroad, Hudson & Manhattan Railroad, New York Municipal Railway and many other transit and banking companies.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Industrial Machinery Division Formed

The Bureau of Foreign & Domestic Commerce, Washington, D. C., announces the formation of an Industrial Machinery Division to provide American manufacturers of machinery with assistance from the government. A pamphlet has been issued describing the functions and aims of the division, together with the service which is available.

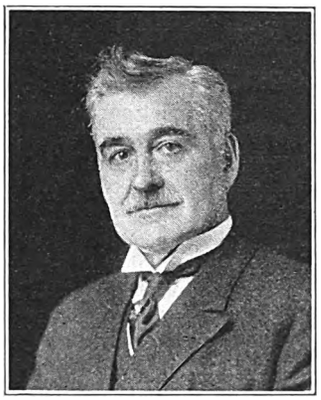
William J. Clark Honored

William J. Clark, pioneer in the commercial development of electric railways in the United States and a member of the staff of the General Electric Company for thirty-four years, has been appointed advisory manager of the G. E. railway department. During his connection with the company, he has been manager of both its railway and foreign departments, managing director of the British Thomson-Houston Electric Company, manager of the Cincinnati office and manager of the London office of the General Electric, as well as holding other positions of importance.

Mr. Clark, who was born in Derby, Conn., in 1854, was instrumental in obtaining the legislative charter authorizing the construction of the first electric railway in the world intended for freight traffic. This was at Derby and Ansonia, Conn. In 1888, he joined the Thomson-Houston Company, of Lynn, Mass., and induced that company to purchase the Van Depoele electric railway patents, which from a patent standpoint were essential to the fullest possible development of that industry. Later he played an important part in the commercial exploitation of these patents as well as the series parallel control, Sprague's multiple-unit train control, Curtis' steam turbine and other inventions. In 1896, at Milwaukee, Mr. Clark made the first, in this country, of what is now termed "physical valuation" of a large electric public utility.

In 1908 he was expert on Cuban affairs for the War Department. In 1906 and 1907 he was the chairman of the ways and means committee of the National Civic Federation, in which connection he financed the extensive investigation of municipal ownership conducted by the federation in this country and in Europe; and he was a member of the commission which made the investigation. He was also connected with the Republican national committee in the years 1880, 1884, 1896, 1904.

Mr. Clark is a member of all the important electrical and railway engineering societies in the country. He makes his headquarters at the New York office of the General Electric Company.



WILLIAM J. CLARK

The duties of his new position, as indicated by the title, will be entirely advisory.

Foreign Trade Convention in Philadelphia

Ways of developing foreign markets for American goods are the concrete problems to be discussed at the Ninth National Foreign Trade Convention in Philadelphia, May 10, 11 and 12, when the best business brains and experience of the nation will concentrate on these questions.

The federal government will be represented through the Department of Commerce. Whether Secretary Hoover will be present is uncertain, but the Department will have a large number of its best executives and experts at the convention. Many of these will come direct from their posts abroad and thus will be able to give up-to-the-minute and first-hand information on foreign trade matters.

The big problem before the convention is how to sell abroad the estimated 20 per cent surplus of American production over domestic consumption. One suggested means is the incorporation in all foreign loans hereafter negotiated in this country of a condition that all or a large part of the proceeds be spent here for American goods. Another means of financing foreign trade that will be stressed is the employment of the gold surplus in the United States.

One general session will be devoted to taxation and currency questions. Shipping matters will be taken up at another, and the tariff and exchange at a third.

How Boston Will Spend Her Four Million

As was mentioned in the March 4 issue of the ELECTRIC RAILWAY JOURNAL the Boston Elevated Railway's 1922 budget will amount to approximately $4,000,000. The following details or the major items of expenditure from this budget are of interest:

For power station equipment	$1,000,000
For shops at Everett and Forest Hills	1,000,000
For new cars	1,100,000
For improved signal system	200,000
For Lechmere Square terminal	100,000
For new lobby building at Malden	50,000
For tools, sprinkler systems and miscellaneous equipment	150,000

ELECTRIC RAILWAY MATERIAL PRICES—MARCH 28, 1922

Metals—New York

Copper, electrolytic, cents per lb	12.75
Lead, cents per lb	4.75
Nickel, cents per lb	41.00
Zinc, cents per lb	4.99
Tin, Straits, cents per lb	29.125
Aluminum, 98 to 99 per cent, cents per lb	19.00
Babbitt metal, warehouse, cents per lb.:	
Best grade	32.00
Commercial	16.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.57½
Somerset mine run, Boston	1.87
Pittsburgh mine run, Pittsburgh	1.85
Franklin, Ill., screenings, Chicago	2.00
Central, Ill., screenings, Chicago	1.87
Kansas Screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$40.00
Standard open hearth rails, gross ton	$40.00
Railroad spikes, drive, Pittsburgh base, cents per lb	2.05
Tie plates (flat type), cents per lb	1.75
Angle bars, cents per lb	2.40
Rail bolts and nuts, Pittsburgh base, cents, lb.	3.87½
Steel bars, cents per lb	1.45
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	1.35

Hardware—Pittsburgh

Wire nails, cents per lb	2.40
Sheet iron, (24 gage), cents per lb	3.72½
Sheet iron, galvanized, (24 gage), cents per lb	4.42½
Galvanized barbed wire, cents per lb	3.05
Galvanized wire, ordinary, cents per lb	2.75

Waste—New York

Waste, wool, cents per lb	13.00
Waste, cotton, (100 lb. bale), cents per lb.:	
White	10.00
Colored	9.00

Paints, Putty and Glass—New York

Linseed oil, (5 bbl. lots), cents per gal	87.00
White lead, (100 lb. keg), cents per lb	12.25
Turpentine, (bbl. lots), cents per gal	87.00
Car window glass, (single strength), first three brackets, A quality, discount*	85.5%
Car window glass, (single strength), first three brackets, B quality, discount*	86.5%
Car window glass, (double strength, all sizes, A quality), discount*	85.0%
Putty, 5 lb. tins, cents per lb	5.50

*These prices are f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb	14.12½
Rubber-covered wire, cents per lb	5.90
Weatherproof wire base, cents per lb	15.50

Paving Materials

Paving stone, granite, 4 x 8 x 4, f.o.b. Chicago, dressed, per sq.yd	$3.35
Common, per sq.yd	3.00
Wood block paving 3½, 16 treatment, N. Y., per sq.yd	2.17
Paving brick, 3½ x 8½ x 4, N. Y. per 1,000 in carload lots	49.50
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.75
Cement, Chicago consumers net prices, without bags	1.94
Gravel, ¾-in., cu.yd., N. Y.	1.75
Sand, cu.yd., N. Y.	1.00

Old Metals—New York

Heavy copper, cents per lb	9.37½
Light copper, cents per lb	8.37½
Heavy brass, cents per lb	5.25
Zinc, old scrap, cents per lb	2.37½
Yellow brass, cents per lb (heavy)	5.25
Lead, heavy, cents per lb	3.81
Steel car axles, Chicago, net ton	$13.25
Old car wheels, Chicago, gross ton	16.50
Rails (short), Chicago, gross ton	13.75
Rails (relaying), Chicago, gross ton	13.75
Machine turnings, Chicago, net ton	5.25

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Coal Prices Decrease on Eve of Strike

The eve of the coal strike has been marked by a further softening of the market. Commercial consumers of coal have turned a deaf ear to the quotations made, while railroads and public utilities, which have been the most active takers, are going out of the market as their stocking programs are completed.

Heavy production in the face of this apathetic demand make lower prices inevitable. *Coal Age* index of spot bituminous prices stands at 170 on March 27, as compared with 173 on March 20. Domestic demand has almost disappeared and only the diminishing output of the resultant sizes kept steam prices from slipping to lower levels in sections where bituminous is used for household purposes.

The industrial consumer had several motives for withdrawing, temporarily at least, from the market. Present consumption rates are so low that reserve stocks are almost topheavy; indications that an announcement of cuts in freight rates will soon be made and the persistent belief that non-union fields will be able to supply fuel needs above existing stocks are the main reasons. No one wants to be caught after the strike with a stock of coal on hand that cost more than its replacement value. That the non-union supply may be adequate is being shown by the increasing desire of those operators to take on forward commitments, and dull times are surely ahead for the coal man unless the present suspension is sufficiently prolonged to enable consumers to work off the reserve supplies.

Westinghouse Electric Company Announces Personnel Changes

Several changes in personnel have been announced by the Westinghouse Electric & Manufacturing Company, among them being transfers of various managers in district offices.

R. L. Rathbone, branch manager of the Cleveland office, will take up special duties in connection with merchandising matters, with headquarters in Cleveland. J. Andrews, Jr., manager of the industrial division, Pittsburgh office, has been appointed manager of the Cleveland office and C. D. Taylor succeeds Mr. Andrews in the Pittsburgh office. R. Seybold has been appointed manager of price statistics and he will act as secretary of the domestic sales committee, among other duties, and will assist W. S. Rugg, assistant to the vice-president in general duties connected with the vice-president's office. W. R. Keagy has been appointed office manager of the Cincinnati office and J. R. Deering office manager of the Los Angeles office. H. S. Walker succeeds M. E. Lanning as promotion man in the Denver office and I. G. Cline takes up the promotion work vacated by R. A. O'Reilly in the Chicago office. K. L. Graham succeeds to the post vacated by H. C. Hopkins as promotion man in the San Francisco office.

Track and Roadway

Portland & Oregon City Railway, Portland, Ore., will extend its line 9 miles from Carver, Clackamas County, to Viola on Clear Creek. Proposed work will cost $90,000.

New York State Railways, Rochester Lines, is planning to reconstruct about 5 miles of single track in Rochester during 1922. This will require new rails, track and pavenment.

Fresno (Cal.) Traction Company has under consideration improvements and extensions of its lines requiring a total estimated outlay of $150,000. Plans have not been revealed.

The Public Service Railway, Newark, N. J., is installing pilot lights on all single-track lines with turnouts on its southern division where one-man cars are operated. This gives the operator the advantage of being able to look straight ahead.

San Francisco-Oakland Terminal Railways, Oakland, Cal., has announced that it will begin work immediately on the double tracking on Fourteenth Avenue between East Twenty-first and East Twenty-second Streets. A switch will be installed to improve service on the Hopkins Street lines. The double tracking will cost approximately $8,500.

Washington Railway & Electric Company, Washington, D. C., expects to extend its Eleventh Street and Lincoln Park lines. The company, according to present plans, will build the Eleventh Street line from the terminal at Eleventh Avenue and Monroe Streets, N. W., to Spring Road, out Kansas Avenue, and connect with the Georgia Avenue line. Overhead trolley construction will be used. The total cost will approximate $107,940. The Lincoln Park extension will include work on East Capitol Street and will cost about $97,250.

Power Houses, Shops and Buildings

Athens Railway & Electric Company, Athens, Ga., will purchase within a few days two 200-amp, 2,300-volt, single-phase regulators of the induction type, self-contained.

Boston (Mass.) Elevated Railway has asked for bids on two underfeed stokers and clinker grinders and the erecting of these under two 1825-hp. B. & W. boilers at the South Boston power station.

Cumberland County Power & Light Company, Portland, Me., has started work on its new $1,000,000 power plant at Knightville. When completed the plant will add 10,000 kw. to company's facilities. The Foundation Company of New York has charge of the construction work.

Rochester and Syracuse Railroad has bought one automatic control equipment for the Macedon substation. This station has two 400-kw. rotary converters, and a change-over switch provides so that either converter can be thrown on the automatic control equipment as desired. The hand control equipment to be removed from the Macedon substation will be used at two other locations.

Professional Note

Union Investment & Contracting Company announces the opening of offices at 7 Dey Street, New York, and the continuance of its business in association with the T. A. Gillespie Company, contractors, and with the Wood Hulse Yates Company, Inc., engineers. The company is prepared to execute for clients investigations, reports and appraisals and to undertake the design, construction, financing and management of industrial and public utility enterprises and other engineering projects. The officers of the company are T. A. Gillespie, chairman of board; F. A. Yates, president; B. F. Wood, vice-president; W. S. Hulse, vice-president; T. H. Gillespie, vice-president and treasurer, and F. J. Nash, secretary.

Trade Notes

Service Motor Truck Company, Wabash, Ind., will supply the Greater Winnipeg Water District Railroad with eleven motor rail buses, at a cost of $176,000.

Irvington Varnish & Insulator Company, Irvington, N. J., announces a change in the ownership of the common stock of the company and the election of a new board of directors, consisting of William F. Hoffmann, Arthur E. Jones, Andrew Young, Carl Egner and D. Frederick Burnett.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received orders from the Commonwealth Edison Company, Chicago, for three 12,000-amp., 60-cycle booster converters with transformer equipment, and one 16,000-amp., 25-cycle booster converter also with transformer equipment. The company also reports an order from the Consolidated Gas, Electric Light & Power Company of Baltimore, Md., for one 16,000-amp., 25-cycle booster converter with transformer equipment.

New Advertising Literature

The Truscon Laboratories, Detroit, Mich., have just issued a second edition of a thirty-two page booklet entitled "Science and Practice of Integral Waterproofing." The first fifteen pages are devoted to explaining why concrete requires waterproofing, and following this are specifications for various methods recommended. There is also a chapter devoted to the practical application of waterproofed cement plaster coat. This publication is being distributed free to those interested.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MacMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

Volume 59 — New York, Saturday, April 8, 1922 — *Number* 14

A Million Dollar Idea

ANTOINETTE FUNK presented an idea at the Mid-year Dinner that is worth a million to the industry. In connection with her "Bond in Every Home" slogan, she suggested that a special appeal be made to the women in selling the stocks of the companies on the customer ownership plan. The women are usually the frugal members of the family. They know how to accumulate a substantial bank account (possibly kept in the "first national bank") through the process of building it up by small additions. Most every wife has a little tucked away somewhere on which she is getting only 3 per cent or no interest at all. How strong would be the appeal to her, then, to find she could just as well be receiving 6, 7 or 8 per cent on her savings with safety. Undoubtedly there have already been many women among the purchasers of utilities securities. These have responded to the general sales activities and advertising. But it is believed that by putting forth a sales campaign primarily directed to the women, companies would find this a source of adding many names to the list of stockholders and securing many thousands of dollars for expansion of the business. Mrs. Funk presented the industry with a real financing idea.

Better Selling Will Help the Railways

REFLECTIONS of increased buying and of renewed activity in physical property maintenance were mentioned last week as appearing in increasing numbers in the columns of this paper. The editors are not anticipating any large amount of new mileage, but this is not an essential to a good year for those serving the field. With finances now permitting, a very substantial betterment program is under way and it is certain to mount up to considerable business because of the deferred work that must be taken care of and because the present competitive era is forcing the replacement of old equipment with new, modern, more economical units and the addition of more facilities, in order to improve service. It is becoming realized with increasing force that, with modern equipment and plenty of it so that the service provided can be first class, the electric railways have nothing to fear from competition.

But better selling means not only getting business for the firm. The salesmen owe it to the railways as well as to their firms to make certain that executives have full information about new and better equipment. Railway men are not the kind who seek out the salesman and urge him to take their money. They have to be sold and sold hard, perhaps several times over. They take certain pride in being hard to convince and, with many problems pressing, they are willing to get rid of a salesman quickly if he "dies" easy. What is needed is some real selling, a reconsecration to good, hard, persistent, intelligent work on the part of the salesmen. For, sad to say, not all railway executives, either, are alert to the new service demands that are upon them, and some good, strong selling may rouse them to their responsibilities and save the day for them as well as the salesmen. Let's have less of salesmen playing with salesmen and more of salesmen working (and playing) with railway men.

Every One Would Lose if the Lease Was Broken

THE present deadlock in the New York transit situation is one which peculiarly calls for a give-and-take attitude on the part of all parties concerned. It has arisen through the Manhattan lease which was executed in 1903 and, unless changed, is to continue until 2874. By its terms the Interborough agreed to pay taxes and all interest on the Manhattan Company's bonds as well as 7 per cent on its outstanding stock and $35,000 annually for organization expenses.

As drafted, the lease was intended to be made as strong as possible, and declares "no reduction of the guaranteed annual dividend rental or in the term of years shall be made without the unanimous consent of the shareholders of record of the lessor"—the Manhattan Company. In other words, the lease is practically a lease to the Interborough by each individual stockholder of his proportion of the property of the company and not a lease by the company as a whole.

Obviously, it is going to be very difficult to get the consent of every stockholder. Hence, the simplest legal way of vacating the lease would seem to be for the Interborough to go into the hands of a receiver and let the receiver void the contract. But this would also be a very serious matter for all concerned; that is to say, not only for the Interborough security holders, particularly the stockholders, but also for the New York Transit Commission, the community at large and the security holders of the Manhattan Railway.

Receiverships are notoriously expensive, so that such action would not be welcomed by the Interborough security holders. The commission would find legal delays acting as a brake to the progress of its unification plan, which it hopes to get finished this summer, and it would have still another large company to bring into line. The public would not only find the present chaotic conditions longer continued, but it might lose the use of some of the extensions built by the Interborough Company for the Manhattan Company, except at an additional fare. Finally, it is hard to see how the Manhattan Company could profit by such a change. It might gain some property or the right to buy that property at a low price from the receiver of the Interborough, and under its original franchise it might be more free to charge a higher fare than at present. On the other hand, besides losing its guarantee, it would have to build up an operating organization, and its operating expenses would naturally be much more than at present. From a transportation and engineering

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standpoint, the subway and elevated systems logically should be operated by the same company.

The situation, therefore, presents the rather unusual aspect of one in which each of the four principal parties to it have considerable to lose and nothing to gain by a receivership. In these circumstances it would seem as if they ought to get together. The duty of doing so is directly up to each so far as each can help.

A Catalyser Is Badly Needed

IN HIS address to the New England Street Railway Club last week E. Mark Sullivan, corporation counsel of Boston, said that the public is generous and is, eventually, right in its opinion or judgment. He also made some complimentary remarks about the management of the Boston Elevated, thus admitting that public utility managements have a speck of generosity, human understanding and ability to work with the public. But what E. Mark did not point out is that frequently one side or both need speeding up in that action which tends ultimately to complete and sympathetic understanding so that "service" may go forward. Too often the conditions are such as to demand a catalytic agent. For example, New York and Chicago.

A catalyser—for those who may have mislaid their chemistries—is a third chemical or agent which, when present with two other chemicals, hastens the chemical action which would eventually take place between the two, though not being a party to the actual affair itself.

In the issue of March 11, in the Publicity Department, there was an example of a catalyser at work. "Verily I Say Unto Thee," by the Little Rock minister, shows one way to expedite the formation of that "eventual" generous and correct public opinion. There are others. The public and the utility managements are, in every community, developing an understanding. But if the public good is to be served, expedition of that understanding is necessary.

To take a text from the Corporation Counsel of Boston and a sermon from a Little Rock minister and apply the result to Chicago and New York may seem far fetched. But the idea appeals as a good one. Surely a good, strong catalyser is necessary in the latter city if not in both.

Deferring Maintenance Expenditure Is Not Saving Money

DURING the past few years transportation companies have kept down operating expenses by all means within their power. They simply had to do it. One result was to enforce economies and efficiency in a manner that would have been impossible in more prosperous times. This is a real gain, for the habits of thrift formed under adverse circumstances will persist even after times become easier. But along with the more economical operation has gone a paring down of maintenance expenditure which is not economical; on the contrary, it is extravagance, for it is impairing the value of the properties.

Some of the well-known steam roads are conspicuous for the way in which valuable physical property is being allowed to run down through the régime of "economy" which is now the rule. These roads are conspicuous because they are so large, but many smaller steam roads and many electric roads are following the same procedure. It is easier to reduce operating expenses in this way than any other, hence the popularity of the method. The results, however, will prove most unfortunate in the long run because deterioration in one part of a property reacts on all other parts. And it is difficult to convince the public of the improving quality of service when the same public sees the instruments of that service becoming less effective from month to month.

Retrenchment in maintenance expenditure may have been necessary, drastic retrenchment in some cases. In extreme cases some properties may have to depreciate further. But the fact that the property is running down should be faced frankly. The procedure is not saving money, in spite of a possible presumption that extra wear can be had surreptitiously, so to speak, from track, overhead, power plant or rolling stock, without any resulting ill effects. Maintenance, if considered over a period of years, is much like the respiration or blood circulation in the human body—cessation spells dissolution.

More Reasons Why Railways Should Be Relieved of Paving Costs

MUCH has been said about the injustice of making an electric railway pay for the maintenance of the paving which is around its tracks but which it does not use simply because the horse railway, of which it is the successor, used to wear out the paving. Not as much has been said about the different character of paving required and its greater cost now as compared with the kind which the horse railways used to lay between its tracks forty years ago. Nevertheless, this imposes about as serious an injustice on the railway as does the fact that a pavement at all has to be maintained. This point is brought out very clearly in a paper presented recently before a real estate association in San Francisco by W. V. Hill, manager California Electric Railway Association, and published elsewhere in this issue.

From another standpoint also the old requirement for the electric railway to bear the cost of a considerable portion of the paving has become obsolete in some sections of the country.

There are many communities in which the method of paying for pavement improvements has changed. Whereas in early days all street paving was paid for by the city, now the abutting property owners pay for the paving. Under the former method, still in force in many cities, the benefit from the railway's paying for part of the paving extended to every taxpayer because it reduced the tax levy of the city. But under the latter method, where the paving is paid for entirely by the property owners, and there is no participation by the city, it is no longer a provision for the benefit of the entire community. Instead of being a provision in the interest of all taxpayers it has changed into a discrimination in favor of that limited number of taxpayers who own property along the line of the railway as against the great mass who live off the line and are required to pay the entire paving cost in front of their property.

In addition, then, to the usual reasons for relief from paving tax, those railways in communities where paving is paid for by abutting property owners have a forceful argument for mitigation of their burden which they should be sure to capitalize upon.

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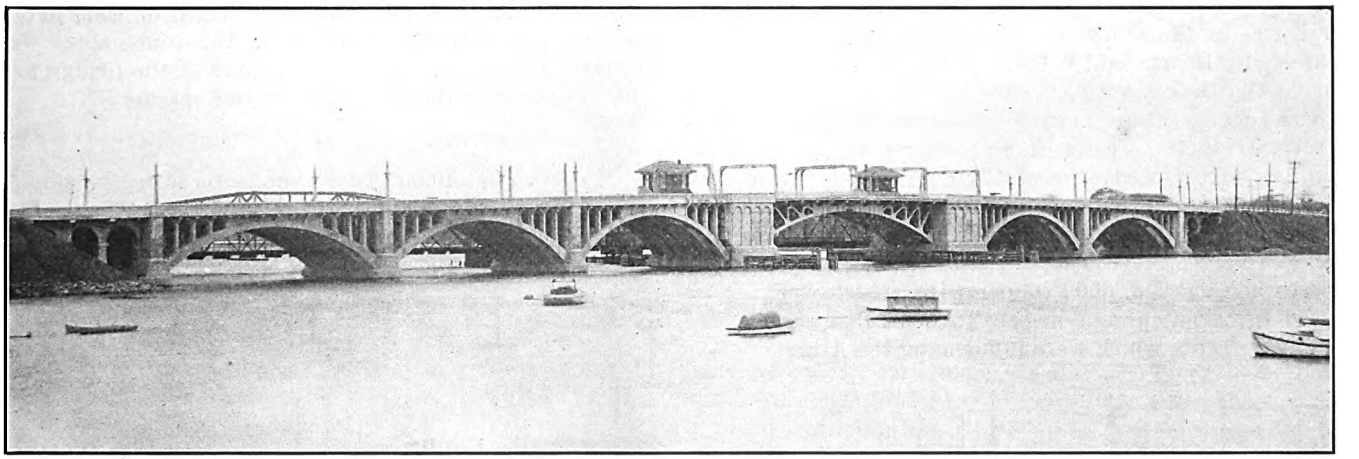
Track and Wiring on Large Bridge

The Connecticut Company Has Recently Completed Interesting Track and Overhead Construction on the New "Washington" Bridge, Spanning the Housatonic River Near Stratford—A Number of Novel Features Are Introduced



THE OVERHEAD WIRE AND TRACK CONSTRUCTION ON THIS NEW BRIDGE ACROSS THE HOUSATONIC RIVER HAS JUST BEEN COMPLETED BY THE CONNECTICUT COMPANY

DURING the seventeenth and eighteenth centuries travelers on the Boston Post Road between Bridgeport and New Haven had to use a ferry to cross the Housatonic River, which at the point where the Post Road crosses the river is about half a mile wide. By the beginning of the nineteenth century, however, the authorities decided a bridge was necessary, and one was built in 1802. Unlike most bridges of that time, it was an uncovered structure, very low, and during perigee or other unusual high tides it was frequently under water. In 1806 there was a big ice flow on the river and the bridge went out into Long Island Sound with the ice.

At that time a popular way by which the authorities provided funds for needed public improvements was to conduct a lottery. The plan was followed to raise the funds in this case, and with the money thus obtained a new bridge was built about 1808. After sixty years of service, this bridge collapsed in July, 1868. In 1892 a new bridge, the third in the series, was again necessary, and it was erected at a cost of $88,500. This bridge served until the new Washington bridge was ready in November, 1921.

In 1897 the Milford Street Railway received permission to cross the bridge, although it was not wide. The original bridge was made narrow, it is said, through political influence because the steam railroad interests feared trolley competition. There was even no footpath on the bridge until twenty years after it was built.

It was thought in 1892 that the bridge then built was heavy enough to stand the strain of highway travel for years to come, but the traffic on this main highway route between New York and New England has been so increasingly heavy during these twenty years that even as early as 1913 there was much agitation in favor of a new bridge.

Work on the new bridge was started in March, 1920. As will be noticed in the engraving at the beginning of this article, it is much higher above the water line than the old one. While this height accommodated the rise in the bank on the east side of the river, it necessitated an enormous amount of fill on the west approach. A few general facts in regard to the bridge will be given before the account of the track and trolley construction on it.

The draw is of the bascule type. The counter weights each weigh 583 tons and are so adjusted with reference to the weight of the lifts that two men can open either side of the bridge. Two 37-hp. induction motors are used, one for each lift, but only 20-hp. is necessary to do the work. In the two lifts a total of 813 tons of steel was used; 32 tons of this amount comprises the weight of the two trunnions. All the machinery used in the operation of the lifts would balance a 200,000-lb. weight. For the operation of the bridge, the main cable, pier lamps, roadway lamps, etc., more than 5 miles of wire had to be used.

From the point of junction of the old and new trolley routes on the Stratford side to the Milford side the old distance was 2,706 ft. The new route is 56 ft. shorter, or 2,650 ft. On the old layout the distance from the change in track location on the Stratford side to the center of the bridge is 1,150 ft.; the corresponding distance on the new layout is 1,300 ft. On the old trolley line there were 820 ft. of double track on the Stratford approach up to the bridge, then 666 ft. of single track across the bridge and 1,220 ft. of double track on the Milford approach. The new layout is double track throughout, and it eliminates the only break in double track between Bridgeport and Milford.

On the new bridge the track on the west approach consists of 771 ft., while that on the east approach is 1,014 ft. in length. The length of track on the concrete part of the bridge is 865 ft., 183 ft. of which is on the lifts.

The bridge was built under the direction of engineers of the State of Connecticut, so that in their work of constructing track across this bridge the Connecticut Company engineers had to adapt their work so as not to interfere with the bridge construction.

As the feeders approach the bridge, the first change in construction takes place with the connection of the

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overhead construction to the underground feeders on the approach itself. Dossert "T" connectors were used to attach overhead feeders to the feeders that ran down the laterals. From the laterals the feeders were run directly through a manhole without splicing and carried along under one sidewalk up as far as the lift itself.

There were six cables thus strung up to the main pier of the bridge, after having been snaked through underneath the sidewalk. This was necessary because the sidewalk was laid before the work was begun. This made the task a very tedious one because there was a space of only 11 in. between the sidewalk and the concrete stringers. Cleats of wood saturated with carbolinium were placed on each stringer to support cables.

Four of these six cables are made up of 750,000 circ.mil flexible stranded rubber-covered copper wire, one No. 6 rubber-covered copper cable for signal purposes and one No. 0000 copper wire, which was used to carry current merely to neutralize the stray currents which were influencing the American Telephone & Telegraph Company's lines. When they reached the lift the feeders had to be changed from rubber-covered into armor-clad submarine cables, so that they could be carried under water to reach the other side of the channel.

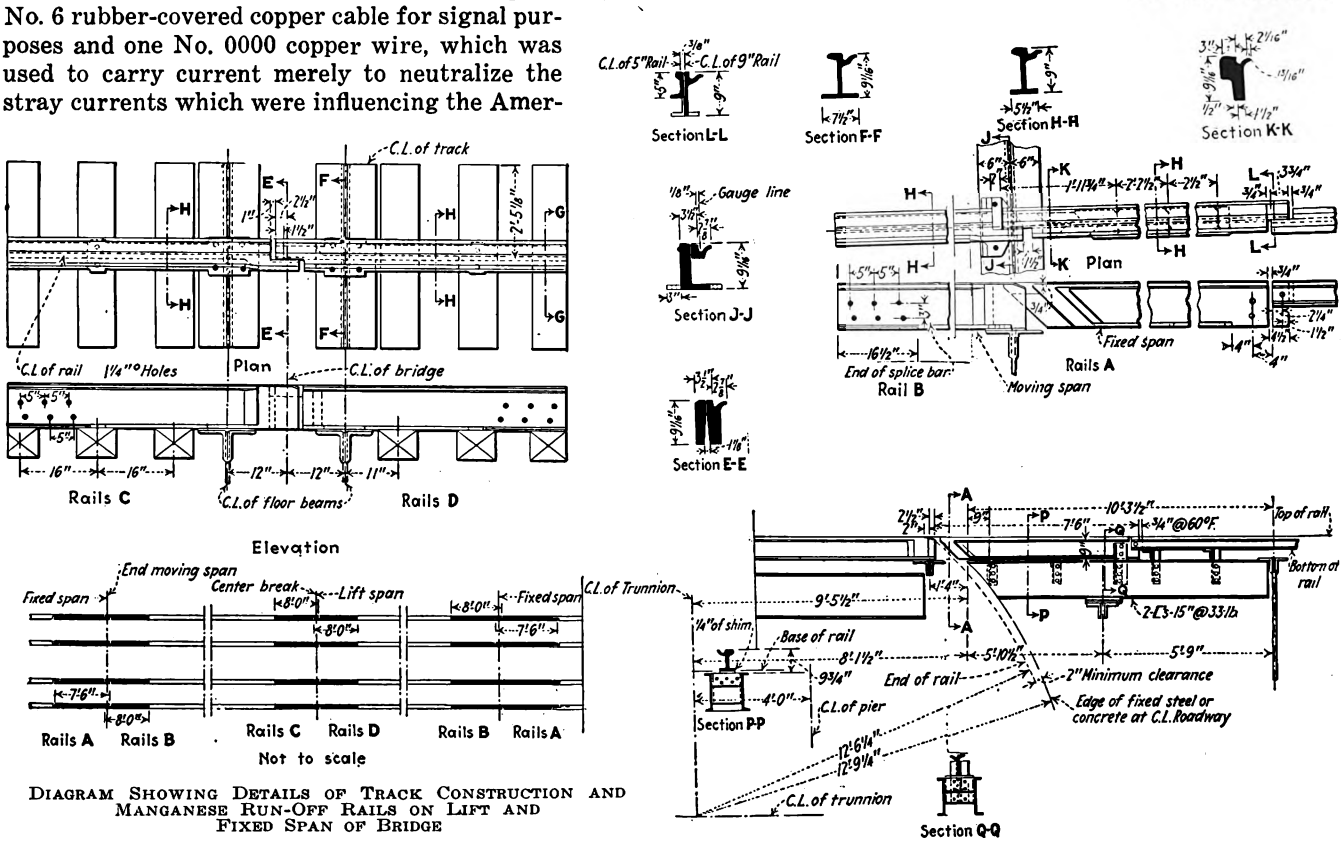

DIAGRAM SHOWING DETAILS OF TRACK CONSTRUCTION AND MANGANESE RUN-OFF RAILS ON LIFT AND FIXED SPAN OF BRIDGE

To do this, the feeders were connected to the submarine cables through a switch box employing 1,000-amp. switches for the main cables and a 500-amp. switch for the signal cable. Two spare 1,000-amp. switches were connected with two spare submarine cables in case some misfortune should cut one of the cables already in use. Before reaching this switch box the signal and four feeders were connected through Westinghouse m. p. lightning arresters. These arresters were connected through a common ground wire to a 1½-in. iron pipe, 18 ft. in length. This pipe was driven into the ground inside of the dolphin, and the No. 0000 copper wire from the arresters was welded to a cap on the top of the pipe.

Leaving the switch box, the submarine cables were cleated to the abutment at dead low tide to resist any possible strain from ice, and then were laid in a trench 6 ft. in the mud outside of the dolphin. The distance from the switch box to a similar box on the other side of the bridge is 435 ft.

In the same trench with the feeders are four 750,000 circ.mil cables for the return circuit, connecting the four rails on the two sides of the bridge. These four cables are connected together at each end by a copper bus bar to protect against the failure of any one cable. Through a knife switch on the trunnion of each lift, a common connection is made from the four cables connecting the rails on the standing part of the bridge to a bond connecting the four rails on the bascule lift.

SETTING OF POLES WAS DIFFICULT

Considerable difficulty was encountered in the setting of the poles on the approaches since all the ground on the approaches was fill and not firm. To make the poles so that they would not give and allow the wire to slacken, very large holes were dug in the side of the fill, in some cases to a diameter of 16 ft., and boarded to prevent slide. The poles were then set 16 ft. in the ground with cement around their base 6 ft. in depth and 3 ft. in diameter. Fifteen poles were set in this way. Fifty-five chestnut poles were set altogether, and they were afterward graded to the specifications of the bridge engineers. To secure these poles further, they were back-anchored to rails 6 ft. long, which were sunk in the fill and concreted in. Guy wires were then attached. Pole derricks had to be used in setting the wooden poles.

On the bridge itself 3-ton solid reinforced concrete poles with square bottoms were used. These poles were made complete upon the ground and were raised and set in holes about 4 ft. deep. While these poles were being made, a short section of galvanized iron pipe was set in the pole at the proper height for the overhead span wire. A bronze ¾-in. x 18-in. eyebolt was later passed through this pipe in the pole to hold the span

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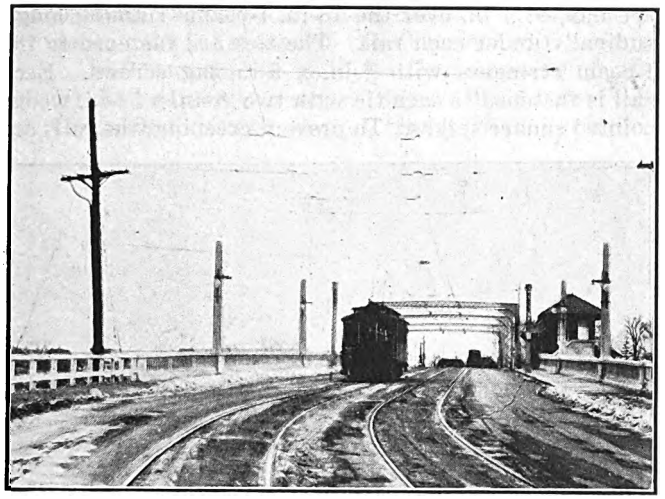
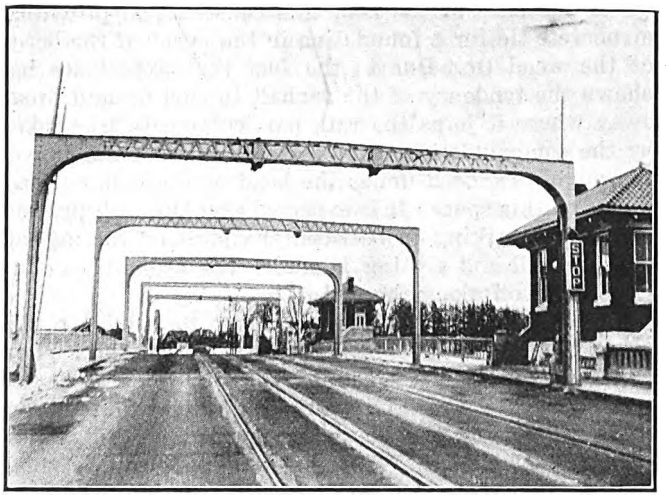


APPROACH TO BRIDGE WITH TRACK AND OVERHEAD IN COMPLETED CONDITION



THE ENTRANCE TO LIFT CLOSED AND TRACKS OPEN FOR OPERATION

wire. These poles were modeled after the type used on the Eighth Street Bridge by the Lehigh Valley Transit Company in Allentown, Pa.

Seven-strand $\frac{5}{16}$-in. copper weld span wire, which is practically free from corrosion from salt water, is used for the overhead and on the bridge is attached to these bronze eyebolts.

CONSTRUCTION ON THE LIFT

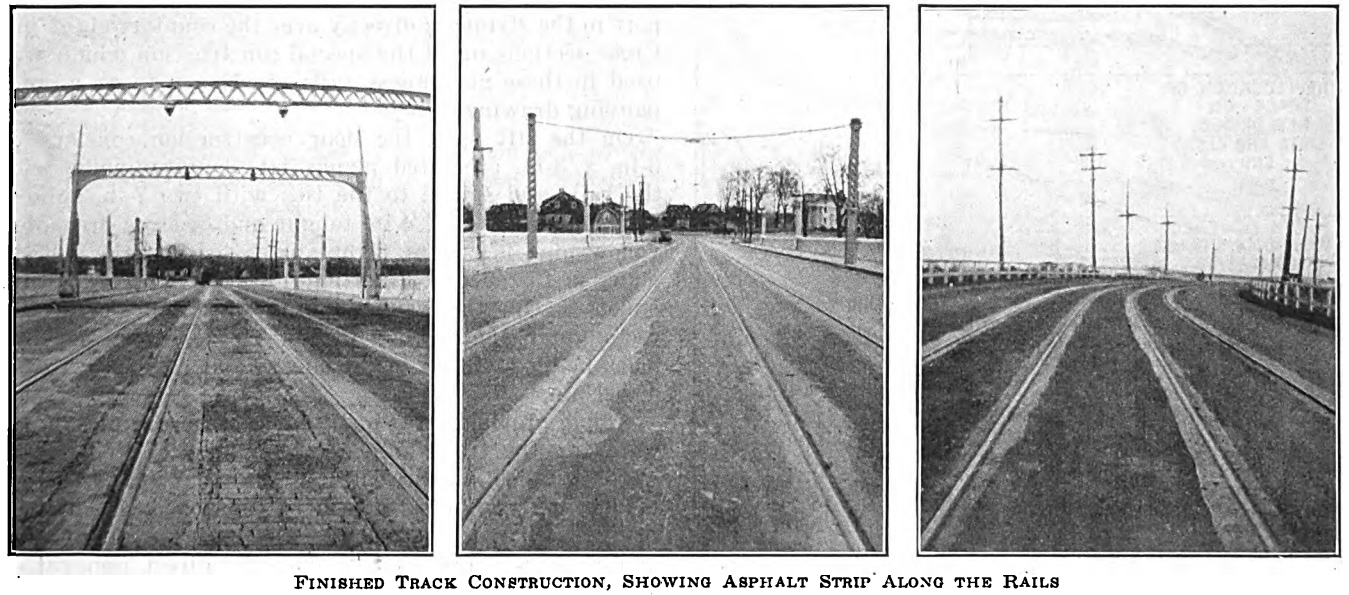
On the bascule lift the overhead construction used is similar to that employed in similar installations by the Chicago Surface Lines. This system may be called the tight live trolley wire, which, in this case, is copper and No. 00 in size. Half of the overhead on each lift is rigid, the other half of the wire being kept taut when the bridge opens by a counterweight on a flexible guy wire which takes up the slack as the lift is raised. The wire is drawn back through an idler, which keeps the wire in position, the tension being supplied by a 1,050-lb. weight. The counterweight for each wire is contained within steel towers about 100 ft. from the lift. By a system of sheaves, the ratio of the movement of the wire to the drop of the weight is 3:1.

This overhead construction on the bridge was installed by the state and differs in some respects from the standards in such places of the Connecticut Company which call for a slack, dead wire. The Connecticut standard allows the wire to hang limp when the bridge is open to navigation, and a knife switch is located on the trunnion which makes and breaks the circuit when the lift is lowered or raised respectively.

TRACK CONSTRUCTION ON APPROACHES

The track construction on the approaches consists of 5-in. 80-lb. T-rail, laid on oak and chestnut ties 6 in. x 8 in. x 8 ft. in size. The ties are laid on 2-ft. centers, and the rails are spiked to the ties with $\frac{5}{16}$-in x $5\frac{1}{2}$-in. cut spikes. Sixty-foot rails are used, the ends being joined together with continuous joint plates, 24 in. long. Each joint is bolted with two $\frac{7}{8}$-in. x $4\frac{3}{8}$-in. bolts. The joints are bonded with two 40-in. No. 0000 concealed bonds. The joint plates were electrically welded at the top to the rails by the Lincoln motor-generator process, 2 in. being left on each extreme end. Two oblong holes, 3 in. x 1 in. in size and about 9 in. on each side of the joint, were cut in the base flange of the joint plates, and the plates were welded to the base of the rail at these points.

The ties and track on approaches was laid on crushed stone and gravel ballast. The pavement is a 3-in. surface asphalt on a 6-in. concrete foundation. The concrete base was constructed so as to give a 5-in. depth



FINISHED TRACK CONSTRUCTION, SHOWING ASPHALT STRIP ALONG THE RAILS

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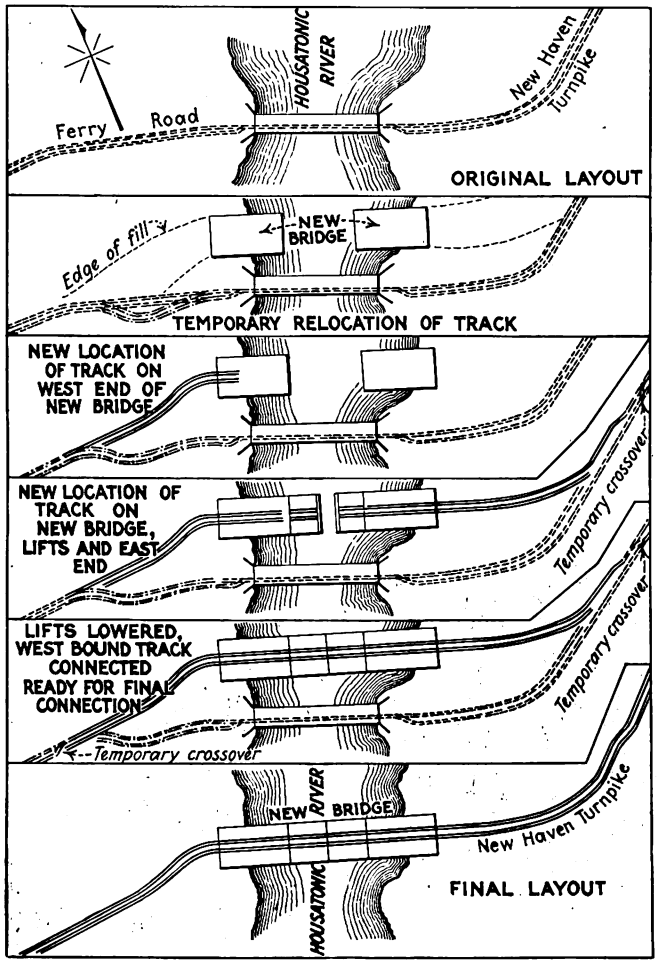
under the base of the rail, this construction providing a concrete tie for a foundation in the event of the decay of the wood tie. Due to the fact that experience has shown the tendency of the asphalt to curl up and break away where it joins the rail, particular care was taken by the company's inspector to see that the asphalt was thoroughly rammed under the head of the rail, entirely filling up this space. It is expected that this will prevent dirt from working in between the joint of the asphalt and the rail and getting in under the asphalt, causing it to spawl off along the rail.

An additional preventive was taken to reduce trouble along the rail by sealing the joint between the asphalt and the rails with a squeegee coat of high test heated asphalt. This was followed with application of hot irons. Some of the views accompanying this article clearly show the results of this work. It will be noted that the seal coat takes in a strip about 8 in. wide along each rail, which is the area that the Connecticut Company is obliged to maintain under the paving law passed by the Connecticut Legislature early in 1921.

The track construction on the concrete portions of the bridge is the same as that on the earth approaches, except that the track is laid in a concrete trough with a ballast of crushed stone. The depth of ballast is about 4 in.

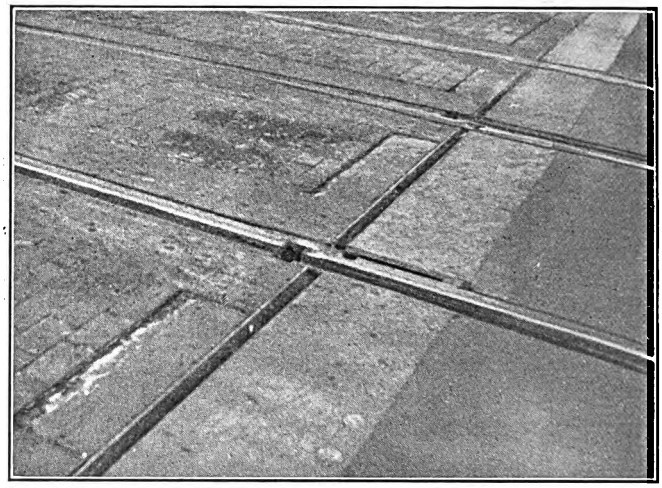
Track Construction on Lift Span

On the lift span, 9-in., 120-lb. Boston grooved rail, laid on 6-in. x 8-in. x 8-ft. creosoted yellow pine ties, was used. The rails are in 50-ft. lengths and twelve-hole bolted channel bars are used at the joints. The ties



Sketches Showing Different Stages in the Work of Changing the Track from the Old Bridge to the New Bridge

are dapped ½ in. over the 18-in. I-beams running longitudinally under each rail. The ties are fastened to the I-beam stringers with ¾-in. x 5-in. lag screws. Each rail is fastened to each tie with two ⅞-in. x 5½-in. wedge pointed square spikes. To prevent creeping, the rails are



Mitered Joint in Manganese Run-Offs Between Lift and Stationary Portion of Bridge

fastened at each end with ⅝-in. x 5½-in. lag screws, which pass through drilled holes in the base of the rail.

The rails adjoining the three breaks in the lift spans, one on either end and one in the center, consist of 8-ft. lengths of manganese steel. With double track and three breaks there are twenty-four of these pieces. The manganese steel sections are the same depth as the rail on the lift but they are of special form. A continuous tread bearing is furnished to the car wheels at these joints between rail steel and manganese steel by the use of square mitered joints, as can be seen in the attached sketch. This is the first use of mitered joints on trolley tracks in this section of the country. Manganese rails are used at these points to prevent pounding and wear.

The sections of manganese rail on the stationary parts of the bridge rail are mitred not only at the breaks, but also at their outer ends where they join with the 5-in., 80-lb. T-rail which is used on the bridge approaches. At this point considerable space is left to provide for expansion of the rails on the approaches. The compromise joint between the 9-in. manganese casting and the 5-in. rail is made by means of a stepped steel support in the stringers directly over the counterweight pit. Cross sections of all the special construction which was used in these manganese rails are shown in an accompanying drawing.

On the lift span the floor construction consists of 3-in. x 8-in. creosoted planks laid longitudinally with the rails and spiked to the ties with two 7-in. spikes. The sub-planking of 4-in. tongue and grooved creosoted yellow pine is laid at right angles to the rails. Each plank is fastened to each nailing strip with two 6-in. spikes. On this sub-planking are laid creosoted rectangular shape wood paving blocks, every seventh block being fastened to the sub-planking by means of a dowel pin.

Ample provision was made for taking care of surface water on the track area of the bridge. Catch basins were installed at the ends of the fixed spans of the bridge and two sets on each of the approaches to the bridge. On each approach of the bridge a pit of adequate size was provided to allow for direct removal of snow. Prior to the work of bridge construction, the

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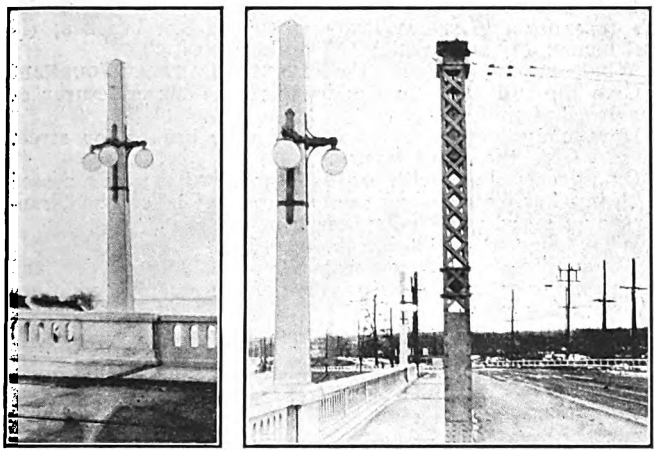
engineer representing the State Highway Department and the division engineer of the Connecticut Company planned each step in the method of construction of the new tracks and the removal of the old tracks to allow for the continuous operation of trolley traffic with the



AT LEFT, ORNAMENTAL CONCRETE POLE, AND AT RIGHT, LATTICE POLE WHICH SUPPORTS SPAN WIRE ON CONCRETE PORTION OF BRIDGE

maximum amount of track facilities without detriment or interference with construction of the bridge proper or the laying of the paving. The first step was to relocate a section of about 800 ft. of double track south about 100 ft. from the highway on to private land. The necessity for this relocation was to allow the State to complete a fill on the west approach to the bridge. It was necessary to obtain a lease of this land from three different parties and arrangements were made for its lease for the duration of the bridge work. The next step was to cut in a switch in the westbound track on the west approach to the bridge and build the new westbound track up to the lift span. As it was impossible to build across the lift span at this time, the second track on the west approach was then constructed. During the construction of these two tracks the ties and rails were laid on two lift spans. It was necessary to lay this track with the lift spans raised at an angle of 70 deg.

The next step was to cut in a switch on the east approach to the bridge, taking off from the westbound track. To do this, owing to a change in the grade of several feet, it was necessary to remove a section of the westbound track between the old bridge and the point where the switch was to be put in. This removal of the old track required the installation of a left hand portable crossover easterly of the point of switch to take care of car operation. It required also a transfer of the United States signal from the old end of the double track at the old bridge to the new temporary crossover. After this work the new westbound track was laid up to the lift span.

Following this, the new eastbound track was constructed. This track was laid from the lift span up to a point about 300 ft. from the point of junction with the old layout, and it was built easterly as far as possible without interfering with the old eastbound track, which at that time was carrying all of the car traffic. The pavement construction on both approaches followed closely behind the trackwork. The work on the lift span being completed, the westbound track was connected up at each end.

Temporary crossovers, a right hand on the east approach to the bridge and a left hand on the west approach, were then installed to allow for car traffic being turned across the westbound track on the new bridge. This change in operation necessitated the transfer of the United States signal on the west approach to the bridge. Following this, operation was begun across one track on the new bridge and track forces were immediately put to work in tearing out the old tracks on each approach to allow for the completion of the connections of the new eastbound track. The tracks were then paved, after which the remainder of the old tracks was removed. All this new track construction and relocation of old track was accomplished without any interference to traffic.

The first track across the new bridge was opened jointly for car operation with vehicular traffic on Nov. 1, 1921. The bridge was entirely open for traffic on Nov. 11, 1921. The engineer for the Public Utilities Commission inspected the construction on Nov. 1, 1921.

Preparing for Electric Traction

AT EDINBURGH, Scotland, the street car system, which has long been operated by cable, has at last succumbed to progress of the times and is being electrified. The accompanying photographs are forwarded from Edinburgh as evidence of that fact. One of the photographs was taken in the armature winding shop of the Strubhill Depot, where formerly only cable car repairs were carried out. There is no doubt about what sort of equipment is being worked on here.

GRAPHIC PROOF THAT EDINBURGH TRAMWAYS ARE NOW BEING ELECTRIFIED

The other photograph shows an extension being built on the Leith carhouse to accommodate the new Edinburgh cars when the system has been electrified. The cost of the carhouse extension is £24,000.

WHERE THE CARHOUSE IS BEING EXTENDED TO CARE FOR THE NEW ELECTRIC EQUIPMENT

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Examination for Foremen

Beaver Valley Traction Company Asks Answers to Sixty-seven Questions Relating to the System to Test Knowledge of Its Employees

GREAT interest was attracted last summer to the questionnaire of Mr. Edison, drafted to determine knowledge on general subjects possessed by applicants to employment with him. Last fall W. H. Boyce, general manager of the Beaver Valley Traction Company, decided it would be well to test the knowledge of the foremen, dispatchers and office employees on that property, not on general subjects but on matters applying directly to the operation of the line. In consequence, he prepared the sixty-seven questions given in the list below and submitted them for answer to the group mentioned. The results obtained were such as to stimulate an interest in the daily affairs of the company among this group. They suggest the desirability of other companies conducting similar examinations.

What is the total population served by the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway Company?

How many miles of track do we have in the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway Company?

Where is the division line between the two companies?

What is the total number of passenger car-miles operated per day on both systems?

What was the total gross revenue for both companies last year?

In your opinion how much less will our revenue be this year than last in both companies?

When does the last car leave Ambridge for Beaver?

At what time should a person leave East End Avenue, Beaver, to connect with car at Fifth Street, Beaver Falls, Harmony line?

What is the fare from Beaver Falls to Industry?

What is the fare from Rochester to Butler?

What is the fare from Ambridge to Morado?

Give average number of car stops which our cars make per car-mile operated.

In labor turnover, what is considered a fair percentage?

What is the average number of car failures per thousand car-miles?

Who built our center-entrance steel cars?

Who built our safety cars?

Is it compulsory that cars be equipped with jacks? If so, why?

In what boroughs do the companies' franchise ordinances regulate the interval between cars? What is the minimum interval required?

What is the value of all our materials carried in stock?

What is our yearly cost of stationery, printing and postage?

What is our total monthly payroll now?

If we desire to put into effect a new tariff, how many days' notice does the Public Service Commission of Pennsylvania require for (a) increase; (b) decrease?

By whom may a complaint be filed against a tariff?

If a complaint is filed, does the new rate go into effect before a hearing is held by the Public Service Commission of Pennsylvania?

How many square miles of street paving do these companies maintain?

What is the average distance a passenger rides?

What is the horsepower of the motors on safety cars?

What is the kilowatt consumption per car-mile for: safety cars, double-track steel cars, double-track wooden cars?

With current cost at 2 cents per kilowatt-hour, what will it cost this company to burn a cluster of five 23-watt lamps twenty-four hours per day? How much per year?

How many watts in an electrical horsepower?

If a vehicle is damaged in collision with a car, who should care for the damaged property? Why?

Why should dispatchers or inspectors spend as much time as possible riding on the cars?

What height does the law require a trolley wire to be above the rail at steam crossings?

Before any work is started on a new construction job, what should be done to be sure that there will be no misunderstanding with the accounting department?

Who controls the advertising space in the regular advertising racks in our cars? What is the address of this firm?

What is the title of the official organ of the American Electric Railway Association?

Who is the secretary of this association?

Who controls the patented devices on safety cars?

Name a manufacturer of: (a) trolley wire; (b) car jacks; (c) car gears; (d) steel ties; (e) automatic block signals; (f) fare boxes; (g) car heaters; (h) carbon brushes; (i) rail bonds; (j) steel rails; (k) brake shoes.

What company publishes the ELECTRIC RAILWAY JOURNAL?

Give the full name and address of the manufacturer of our No. 514 motors.

How many companies manufacture air brakes for street cars? Give their full names.

On a good rail and with brakes in good order, with a seated load, in what distance can the ordinary car be stopped, running at a speed of 18 miles per hour?

What per cent of 720,000 is 540,000?

If the receipts of a company are $650,000 per year, and its operating expense is 87 per cent of the receipts, what are its operating expenses?

Why should a date always be put on all data and inter-office communications?

In addition to all construction expense, to what boroughs did these companies pay a bonus? Show the amount paid each.

What is the total amount of bonds of the Beaver Valley Traction Company in the hands of the public?

What is a watt?

What is voltage?

What is an ampere?

What was the number of car riders carried last year by both companies?

How much of a dividend is paid each year on the stock of the Beaver Valley Traction Company?

Give the name and address of the manufacturer of Spearmint gum.

What baking powder is advertised in our cars?

What bank advertises in our cars?

What is the distance from Junction Park to end of line, Morado?

What is the distance from Junction Park to Sassafras Alley?

What is the distance from Ferry Street to Leetsdale?

How many thousand car-miles life do we get out of 33-in. steel wheels?

What does "C.M." stand for when used in connection with wires and cables?

Name five street railway companies which are in the hands of receivers.

How many more seats do we furnish per day than there are passengers to ride?

If each conductor should fail to register one fare for each zone that each car passes through per day, what would the loss to these companies amount to in one year?

Give the exact location of: H. H. Robertson Company; Moltrup Steel Products Company.

What is the cost of welding a joint by the Lorain process?

What is the cost of excavating for and replacing the paving after welding?

How long should these joints increase the life of the rail?

Foreign Standards Available Through A. E. S. C.

THE American Engineering Standards Committee has selected and listed a large number of standards issued in 1921 by foreign national standardizing bodies. Copies of these can be had from the office, 29 West Thirty-ninth Street, New York City, at merely nominal prices.

Among these standards may be mentioned tramway tires and tramway axles (British), benzol for motor fuel (British), creosote for the preservation of timber (British), brick (Canadian), bolts and rivets (Canadian) and roofing tiles (German). More than 100 specifications are included in the list. In acting as sales agent for the standardizing bodies of other countries, the Standards Committee is carrying out a plan which is being followed throughout the standardizing countries.

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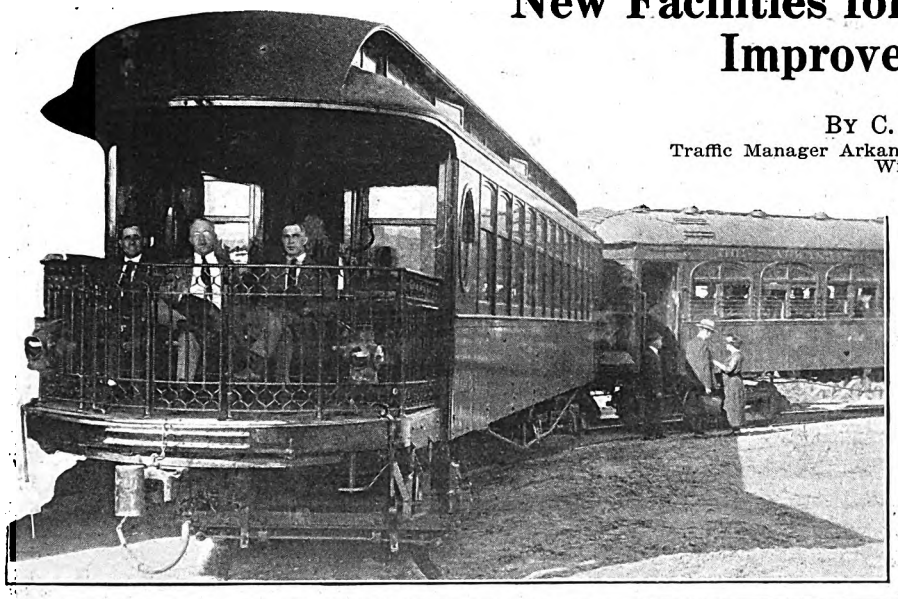
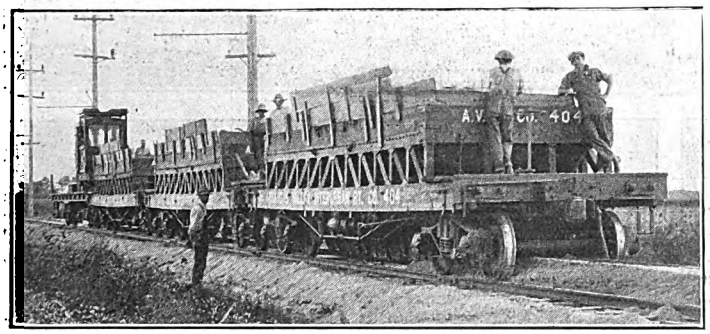
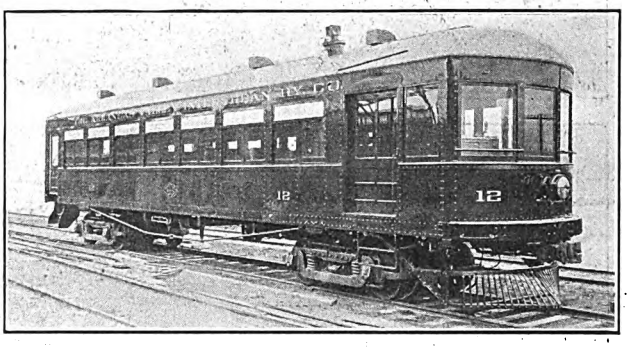
New Facilities for Kansas Interurban Improve Earnings

BY C. M. MORRISON
Traffic Manager Arkansas Valley Interurban Railway, Wichita, Kan.

Private Right of Way Into Wichita and New Passenger and Freight Terminals and Shops Built, Roadbed Improved and New Steel Cars Purchased







At the top is an observation trailer used with two and three-car trains. Below at the right is shown the latest type of all-steel passenger car in use on the Kansas lines; at the left, a work train distributing ballast in improving roadbed.

SINCE the property of the Arkansas Valley Interurban Railway, connecting Wichita, Kan., with Hutchinson and Newton, Kan., was described in the issue of the ELECTRIC RAILWAY JOURNAL for June 2, 1917, Vol. 49, page 996, rather extensive improvements have been made. These have included the purchase of new all-steel passenger cars, the building of a new passenger station and general office building, freight terminal and shop in Wichita, the building of a private right of way into Wichita and general improvements over the road.

Formerly, entrance into Wichita was made over the tracks of the local street railway company, but it became evident in 1918 that the passenger, express and package business handled by the interurban company was growing to such an extent that it would be greatly to its advantage to operate over private right of way. Such a right of way through the north and west sections of the city was secured during the next two years, and in 1920 the new track was built, leading to the 12-acre terminal site located on the east bank of the Arkansas River at Douglas Avenue, which had been purchased by the company. This piece of ground is only four blocks away from the main business center of Wichita, providing a very favorable situation for the passenger and freight terminals of the interurban line.

A beautiful new two-story passenger station and general office building was erected during 1921, facing on Douglas Avenue. A new freight station located almost directly behind the passenger station and fronting on Waco Avenue was also built. The building of the terminal track, the two-story freight station, the two-story passenger station and general office building, the retaining wall along the river, and a five-track shop located on the opposite side of the river, were completed at a cost of $380,000. The use of the private right of way and new terminal facilities has made it possible to cut from five to ten minutes off the running time of various trains.

The new Wichita passenger station and office building measures 100 ft. x 100 ft. and is built of dark red tapestry brick with stone trimmings and green tile roof. It is considered one of the finest stations of its kind in the country. The ground floor comprises a large waiting room located at the rear of the building and connected with the Douglas Street entrance by a long, wide corridor. The height of this waiting room takes in the entire two-story height of the building. The ticket office is located at one side of the waiting room and the baggage and express room directly opposite. There is an up-to-date restaurant and lunch room adjoining the waiting room, and the remainder of the ground floor is given over to various shops. A ladies' rest room and men's smoking room are provided directly off the main waiting room, and the stairway to the general offices upstairs also leads off the waiting room.

The interior of the waiting room and corridor is finished in buff-colored tapestry brick with glass partitions and oak woodwork separating it from the restaurant and shops. All of the second floor of the building is used for the general offices of the company and these rooms are reached from a hallway or balcony

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Some of the Improved Facilities Which Have Resulted in Increased Business for the Arkansas Valley Interurban Railway

No. 1—New passenger station and general office building at Wichita, Kan.

No. 2—Waiting room in the new interurban terminal, Wichita, Kan.

No. 3—Interior construction and equipment of new Wichita shops.

No. 4—New interurban freight station at Wichita.

No. 5—Six-track shop recently built for Kansas interurban.

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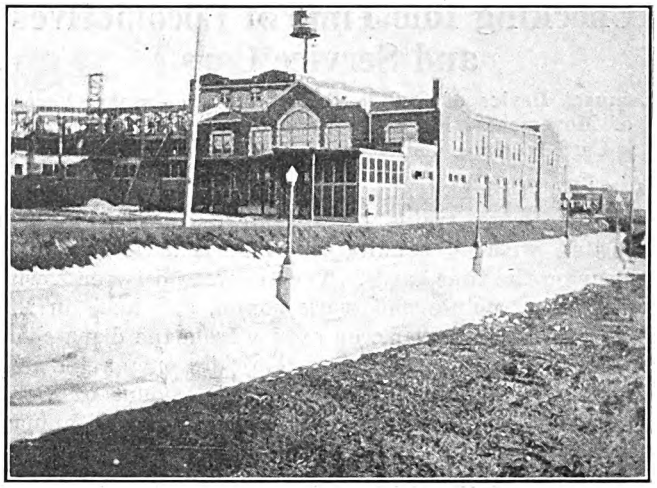
NEW HOTEL ADJACENT TO INTERURBAN TERMINAL NEARING COMPLETION



RETAINING WALL ALONG ARKANSAS RIVER WHICH PROTECTS NEW STATION—NEW HOTEL IN BACKGROUND

which overlooks the passenger waiting room below. All of the offices in the building are finished in natural oak except that of the president, which is finished in mahogany.

The new freight station at Wichita is constructed of red brick with the freight room on the first floor and three offices and a large room, where meetings and social sessions are held by the trainmen, on the second floor.

The new car shops are of up-to-date design and provided with six tracks and all well equipped for handling the equipment repair work.

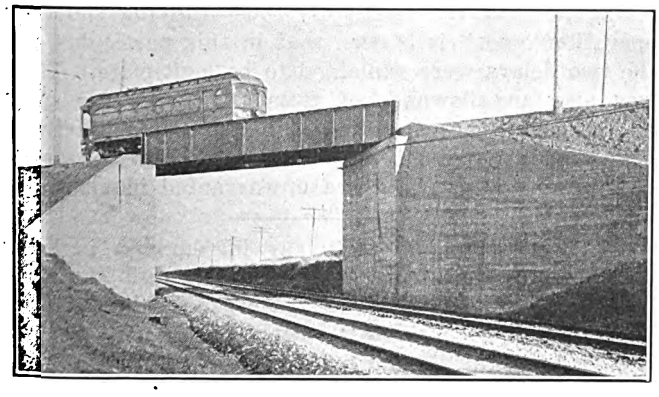
Industrial tracks are now being put in to reach several of the larger industries at Hutchinson, Kan., and also track connections with some of the steam roads. Other steam-line connections are expected to be put in at Newton. Through traffic arrangements with the steam lines are anticipated, and with these physical connections the interurban will be in position to handle all classes of freight, both carload and l.c.l., to and from all points, which should be the means of very materially increasing the freight revenue.

	1914	1916	1918	1920
Gross earnings	$137,454	$271,107	$328,611	$547,375
Operating expenses	79,612	140,684	228,737	337,254
Net earnings	$57,842	$130,423	$99,874	$210,121
Interest and taxes	58,387	83,222	95,150	79,646
Net revenue	$545*	$47,201	$4,724	$130,475

* Loss

Another thing which may bring additional passenger business to the interurban is the construction of a new $600,000 hotel to be known as the Broadview, on property adjacent to the interurban passenger terminal. While this hotel is not the property of the interurban, a large amount of the stock is owned by stockholders of the railway, and it is planned to have a large arched corridor directly connecting the lobby of the hotel with the passenger terminal.

That these various improvements have been instrumental in improving the operating efficiency of the company and bringing new business to it is shown by the accompanying operating statement of the company for two-year periods since 1914.



A. V. I. CROSSING OVER SANTA FÉ TRACKS ON NEWTON BRANCH

Santa Fe Line Proposes to Extend Into San Pedro Harbor of Los Angeles

THE Board of Harbor Commission of the city of Los Angeles has granted the Atchison, Topeka & Santa Fé Railway permission to enter into the Los Angeles harbor at San Pedro for the purpose of constructing and maintaining a railroad line into the harbor in competition with the Southern Pacific Line, Los Angeles & Salt Lake Railroad (Union Pacific System) and the Pacific Electric Lines. In order to reach the harbor the Santa Fé is obliged to construct a branch extension of some 15 miles from a point on its Los Angeles-Redondo Beach branch line, diverging from this branch line at some point between Inglewood and Redondo, thence to the harbor at a point at the northwest corner of the west basin of Los Angeles harbor.

The project will involve the expenditure of approximately $2,000,000. It will be undertaken as soon as certain franchises are granted by the city of Los Angeles and permission obtained from the Railroad Commission, as well as from the War Department, to span the west basin with a trestle.

Practically all the municipally owned tracks of the city of Los Angeles at the harbor serving the municipally owned wharves and warehouses in the inner and outer harbors, as well as numerous large industrial plants, are electrified and electrically operated. The city's trackage of approximately 12 miles equivalent single track was electrified at time of original construction, and the switching on these tracks is performed by the electric locomotives of the Pacific Electric Railway, which has interchange connections with the city's trackage and handles the service for the city through agreement.

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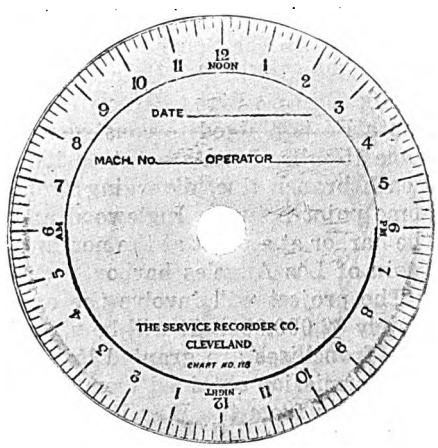
Checking Idle Time of Locomotives and Service Cars

Compact Device of Simple Design Makes Graphic Record of Movements—Keeps Crews of Trains Not on Time Card Working and Accounts for Legitimate Delays

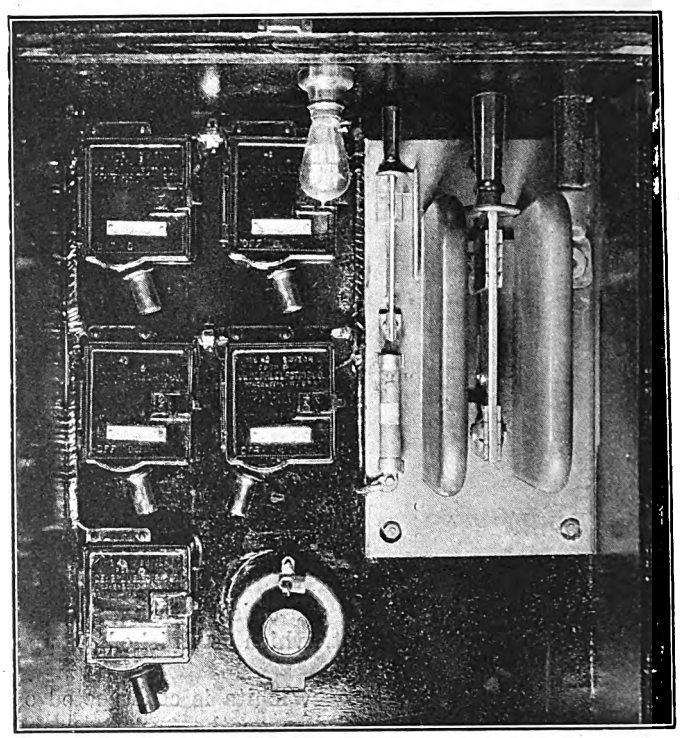
MANY freight trains, line cars and maintenance of way work trains on an interurban railway are operated without definite schedule time and do not appear on the time cards. They operate between towns and passing points and work points, and keep in the clear of scheduled traffic on orders from the dispatcher. The crews of such trains are therefore out on the line largely without supervision and the amount of work they do is at their own discretion. As a natural human trait, some loafing develops.

As a check on the idle time of these "extra" trains, the Illinois Traction System has installed on twenty-five of its electric locomotives a small device called a "service recorder" which makes a twenty-four-hour graphic record of the time during which a locomotive is running or standing idle. This device is manufactured by the Service Recorder Company, Cleveland Ohio, and consists of a simple clock mechanism for driving the paper chart and a pivoted weight having a steel point which bears against the paper chart. The whole mechanism is contained in a neat little steel case about 6 in. in diameter and 4 in. thick, and the device may be mounted anywhere in a car. When the engine or car is standing, the device produces a simple line on the chart, but while running, the vibration causes the weight to swing slightly, producing a jagged mark. The use of a special type of paper results in a distinct marking of the chart without the use of ink. There is therefore nothing to do to keep the device operating except to wind the clock and replace the chart once in twenty-four hours. On the Illinois Traction System locomotives, the device is mounted in the bottom of the switch cabinet, where it cannot readily be mechanically connected with the air pump, for example, to produce an artificial motion record. The value of the device is greatest on engines engaged entirely in switching, as the dispatcher has some check on a train out on the road, but he has practically none on a switch engine. A device is taken off a locomotive now and then and put on a line car for checking up on the work done by a crew stringing trolley wire, setting poles, etc., or on other work cars for a check period. If excessive idle time appears on the chart, a check-up is made.



A TYPICAL CHART MADE BY "SERVICE RECORDER" MOUNTED ON LOCOMOTIVE

The routine on the Illinois Traction System is that the mechanical department inserts and removes the charts and forwards them to the superintendent, who has the chart checked with the train operation report daily. If the chart for any locomotive shows up excessive idle time, the superintendent writes a letter to the crew for explanation, and then the reply and the whole correspondence are forwarded to the general manager.



"SERVICE RECORDER" MOUNTED IN SWITCH CABINET OF AN ILLINOIS TRACTION SYSTEM LOCOMOTIVE

A typical chart taken from the "service recorder" is reproduced herewith. By consulting the train operation report, the movements of the particular engine can readily be traced and explained for the day, as follows:

The engine left Springfield, Ill., at 7:01 p.m., with fifteen cars of grain for Granite City, Ill., where it arrived at 6:30 a.m. En route, at 11:10 p.m. it had to clear, at the Alton siding, a northbound fast freight train which had the right of way. There was a delay of nearly forty-five minutes here waiting for the passing. It was necessary for the train to remain here rather than to proceed further while waiting, as the next passing point was beyond Carlinville and there was work to be done at Carlinville. The train then lay at Benld from 1:15 to 2:10 in order to clear a sleeping-car train. The freight train left Benld right after the sleeping-car train showed up, indicating that the crew had completed the loading and unloading work at this point before the wait for the passenger train began, although there was evidently not time to go to the next siding to make the meet. By thus studying the train operation report, it is seen that in this particular case the two delays were explained to be legitimate. There was also an allowance of twenty minutes for lunch which may have been taken at Benld. This illustrates how a long standing period as recorded on the device may be analyzed to disclose unwarranted idleness.

The first one-man safety car in England is being tested out by the London United Tramways. Owing to the absence of a double deck and other special features, it is attracting considerable attention. About the only change from the standard American style of car is the use of track brake.

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Electric Railway Publicity

Devoted to How to Tell the Story

$825,000 of Preferred Stock Sold

Publicity Playing a Very Important Part in Distributing Security Issue Among Residents of Territory Served by Northern Ohio Traction & Light Company

BY E. B. ATCHLEY

EMPLOYEES of the Northern Ohio Traction & Light Company, Akron, Ohio, began the sale of the company's 7 per cent preferred stock to the public last July. At the close of business on Feb. 28 approximately 6,750 shares of a par value of $100 each—$675,000—had been sold by them. About 1,500 shares have been sold through other sources, bringing the total to a little more than $825,000 in approximately seven months.

How was this accomplished in view of the business depression so keenly felt in that section of Ohio traversed by the lines of the company? That is the first question to arise. What methods were adopted to interest the employees and to keep that interest aroused? That, perhaps, is the second question to arise. Every company planning to start a customer-ownership stock selling movement is interested only in this—and presentation of the advantages to the public.

The Northern Ohio Traction & Light Company has approximately 2,000 employees. When the movement to sell the stock was launched in July, meetings of employees were held in every department over a period of a week. The reason for issuing the stock and the reasons why the employees were needed to sell it were thoroughly explained by A. C. Blinn, vice-president and general manager, and other company officials. At these meetings the employees were asked to buy stock.

DETAILED PREPARATION FOR SALE

Prior to calling the meetings, the company had prepared an extensive advertising campaign. The issue was thoroughly explained in the employees' magazine. Letters to all employees and all customers had been prepared and signed by Mr. Blinn and were ready to go into the mail. This advertising—letters, magazine, all literature—was released immediately following the meetings with employees. The newspaper advertising and the street car advertising were used effectively to back up the employees. Each advertisement contained this line: "Ask any employee for information."

Almost 1,700 shares had been sold by Aug. 1 and 1,450 more were sold in August. Most of these 3,150 shares were taken by employees. The work of selling the actual stock to employees proved easy, despite the fact that the plan was launched immediately following a strike of the trainmen. The task of selling them the idea of selling customers proved not so easy, however. Trainmen were particularly slow to take hold in the sale. The employees in the ways and structures department—track men—were the first to respond to the appeal. In September 516 shares were sold to customers principally by the track gangs—the men who use the pick and shovel. The production and distribution department employees had a hand in the sale, but not to any great extent. General office employees sold very little.

In October and November, in view of the great number of unemployed in Akron and the coming of winter, there was a heavy decline in sales. In December sales picked up to 1,054 for the month, held steady in January and February, while in March about 1,500 were sold, indicating a steady purchase of 1,000 to 1,500 shares by customers monthly.

AROUSING INTEREST PLAYS BIG PART

Now, how has the interest been kept up? The answer to this may prove worth while to companies contemplating permanent financing by this method.

In the beginning, employees were paid a commission of $3 for the sale of one, two, three or four shares, $5 for five shares and 50 cents per share for each additional share to one individual. Special editions of the *Northern Light*, the company publication, were issued weekly containing names of employees who made sales and the number of shares each man sold. Meetings were held weekly with the heads of all departments to discuss the sale of the stock and special meetings were held with the men monthly. An employee of the company who had been placed in charge of the sale talked to all employees once every month, going out to the track and line gangs, shop men, track men and all others. In most instances these talks were delivered to the men in small groups. The men stopped work for a few minutes until the talk and the discussion were ended, when they went back to the job. Appeals were made again and again. After two months only forty-five employees out of 2,000 were actually producing, although prospects were being turned in by about 150 others. It was an uphill job, but after six months effort more than 150 employees are now actually making sales and 1,000 or more others are turning in live prospects.

Late in November the slogan "Buy a Share of Stock for a Christmas Present" was taken up. This slogan, carried in all the advertising, pushed up the December sales. In January, to keep the interest going, special bonuses were offered to the individuals selling the greatest number of shares, to those selling to the greatest number of individuals and to the department making the best sale record. In all, seven prizes were offered.

Following this a new plan was adopted. The commissions were increased to a point where each employee now receives at least $1 for each share he sells. In addition, a special bonus has been arranged. A quota of 1,000 shares was set for the special contest now in progress. If the quota was reached in March each man producing sales received an additional $1 per share. If 1,100 shares are sold, the producing employee receives a bonus of $1.10 per share, or if only 900 are sold the bonus is 90 cents per share and so on, up or down. This method of arousing interest is proving the most effective of all.

In the stock department of the general office in Akron

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hangs a large chart showing the day-to-day standing of all departments of the company. On this chart the thermometer idea is carried out, the changing conditions appearing in red paint on the thermometer. The chart shows seven departments with the quota for each department. This quota is based upon the number of employees in the department. Similar charts on a smaller scale are placed with each of the seven departments and there is an additional chart showing the department subdivision which is painted in the same manner. This has brought the responsibility for selling the quota assigned to very small subdivisions. For instance, the general office is divided into accounting, billing, commercial, cashier, credit and collection, meter reading, stenographic, payroll, purchasing and claim departments. There is a thermometer showing the standing of each of these divisions based on the quota assigned to it.

Stock Department Resembles Broker's Office

Aside from the charts referred to, there is a large wall map of the system hung in the stock department. Whenever a share of stock is sold a pin goes into the map at the point where the purchaser resides. Needless to say, there are a few thousand pins in this chart, and it is pretty well plastered up. There is little doubt that the map will prove interesting to aspirants for office in this section in the future when questions concerning this utility arise.

Every morning the department head calls the subheads in his department and receives the stock report. This has brought about strong rivalry among the various subheads and often the stock department resembles a broker's office where the tape is bringing figures to be chalked up.

Daily bulletins are quickly made up and are sent to the departments pointing out what some department has accomplished and spurring the others along. These bulletins keep the interest going and have been instrumental in building the sales. Stickers with commission and regular pay checks bearing the words, "I Am Doing My Share, Are You?" and "Sell a Share a Month" also aid in keeping up the enthusiasm.

And now a word about publicity advertising the stock. The price of the stock was fixed at $95 a share and accrued dividend. This price yields the purchaser 7.37 per cent. These figures—7.37—have become synonymous with the company stock the whole length of the system. They appear on all company envelopes, on stickers, in all cars, billboard and newspaper advertising. When the customer-ownership plan was started solid red posters bearing the figures 7.37 in white went into all cars. This created interest and people began asking what they meant. Five days later other solid red posters were displayed in the cars. They carried the words "7.37 per cent. The N. O. T. & L. Co. is offering its 7 per cent cumulative preferred stock at $95 and dividend per share, yielding 7.37 per cent."

The first newspaper advertisement consisted of a full page in all papers in the territory, changed to meet local conditions. In Akron the advertisement dealt principally with the light and power business. Outside of Akron it was confined to the railway business. "Make These Sockets Earn You Money" was the heading of the one with a giant hand turning on light in the home. The other bore the heading "It Earns as It Runs," the words carrying an interurban train. The page advertising was followed by "ads" of four full columns, illustrated, with the headings: "Your Salary May Stop, but Dividends Keep Coming In," "The 'Old Age of Want' Bogie," "Prepare Your Boy for the Battle of Life," "Put the Northern Ohio Traction & Light Company on Your Investment Map," "Protecting Your Electric and Transportation Service When There Is a Storm," "S.O.S." and "The Finest Christmas Present in the World."

Three-column "ads" followed these. Later, however, the "ads" were dropped to two-column, 8 in. Today very little newspaper advertising is being done. Two novel window displays, one consisting of a miniature city, electrically lighted and containing a street railway system with moving cars, and the other displaying the entire interurban system from Cleveland to Uhrichsville, attracted the attention of thousands. These displays widely advertised the stock. In the miniature city little billboards, advantageously placed, urged stock purchases. The displays were in the windows of the Terminal Building, Akron, and just inside that building a "Stock Department" was established, with an employee in charge who had been a successful salesman. Steadily through all this the *N. O. T. & L. News*, the weekly publication placed on the cars, carried information concerning the stock with a blank to be filled out by all persons interested. Many good prospects were developed from this source.

The methods adopted in the sale of stock of the Northern Ohio Traction & Light Company are the same as those that have been adopted on the Consumers Power Company in Michigan, in Peoria, Ill.; Springfield, Ohio; Evansville, Ind., and on other properties operated by Hodenpyl, Hardy & Company, who also operate the Northern Ohio property. On all these properties the sale of stock has been successful, not only in the amount issued to customers but in the establishment of increased confidence and good will.

Publicity Popularizing Weekly Pass

After You Light Up at the Cigar Store Buy a Pass for Fort Wayne City Lines for $1 Good for a Week—Company Supplements Its Original Work

THE Indiana Service Corporation in starting its new weekly pass system on the city lines in Fort Wayne, Ind., relied entirely upon newspaper publicity to acquaint the public with the innovation and to work up a good sale of the passes. No car cards, booklets, folders, billboards or other methods of advertising were used. But the newspaper space used was very large; half-page ads predominated. The newspapers, of course, devoted much news space to the passes, thereby greatly increasing the publicity secured for the new plan.

Later on the company intends to issue a booklet similar to the one which it now uses, and in which the schedules for the different lines are given and in which there is much general information concerning the company. The corporation also intends to include all the information regarding the passes in this booklet. It will be widely distributed on the Fort Wayne city cars, at cigar stores and through the mails.

The initial information which the people of Fort Wayne received as to the intention of the company to sell weekly passes for a dollar good at any time during the week on any Fort Wayne city lines—these passes being transferable—was through news items in the local daily papers.

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Following this initial shot—this news being played up by all the local papers quite extensively on the first pages under big headlines—the corporation placed a half-page ad in all the papers. This announcement read:

"THIS IS THE WEEKLY PASS.

"Indiana Service Corporation.

"Weekly Pass.

"Feb. 27 to March 5, 1922 (Inc.).

"Pass bearer on cars of the Indiana Service Corporation within the one fare limits of the city of Fort Wayne for a period of seven (7) days as shown by dates on the face of this pass.

"Pass must be shown conductor upon entering car and is good only for one (1) passenger.

"No. 3994. SAMUEL W. GREENLAND."

(S. W. Greenland, it might be noted here, is the general manager of the company, so is the person to sign the passes as indicated above.)

"Savings.

"If you ride twenty times per week your fare will be 5 cents. If you ride thirty times per week it will be 3.3 cents per ride.

"Why not buy a weekly pass and ride home to lunch. Get a hot home cooked dinner.

"It's cheaper than shoe leather, why walk to and from work? Buy a weekly pass—save time and energy.

"Why fuss every morning with that cold engine?

"Warm, comfortable street cars are ready to serve you at any time. The $1 weekly pass makes it convenient and economical.

"Money saved is money earned, buy a weekly card pass, save car fare and deposit the difference in a savings bank.

"Pass can be purchased from our operators.

"The weekly pass will save time in loading and relieve congestion.

"Transfers are unnecessary for passholders.

"Passholders may ride as frequently as desired and transfer to suit their convenience."

The foregoing advertisement appeared in the local papers without change several times during the week preceding the start of the new system.

During the second week the new system was in force the company used the following ad in all the papers in half-page space:

"WEEKLY PASS.

"The popularity of the weekly pass has been indicated by the sales during the sale period, from Friday to Monday inclusive, viz.: the first week 2,967 were sold and the second week 3,546, making an increase of 579.

"Some confusion has developed relative to transfers since the weekly pass has been put into effect.

"Transfers will not be issued to passholders and therefore it becomes absolutely necessary that all passengers paying cash fares or tokens must request their transfers when they board the car and at time of paying their fares; otherwise transfers will not be issued.

"To issue transfers after fare has been paid not only imposes a double duty on the operator, but very materially interferes with loading and unloading of passengers. Neglecting to get your transfer at the proper time only stimulates the forgetting habit and in turn often results in unpleasant controversies and misunderstandings. The operator with his many and ever changing passengers cannot be expected to know whether a transfer has already been issued; neither does he know whether you paid your fare by presenting a pass and therefore are not entitled to a transfer. Compliance with these instructions will prove to our mutual advantage.

"We solicit your co-operation.

"INDIANA SERVICE CORPORATION."

One other advertisement, also half page in size, which was a slight variation of the ad quoted above, was used in putting over the pass system with the Fort Wayne public.

That the publicity combined with the value of the system effectively "sold" the new system to the Fort Wayne public is indicated by the record of passes sold during the first month's operation of the system. Here is the record: First week, 2,967; second week, 3,546; third week, 3,517; fourth week, 3,722.

The officials of the company believe that when the system's value is fully appreciated by the general public the sales of passes will run up to 5,000 or 6,000 a week. It is the intention of the corporation to continue its newspaper advertising, using smaller space, though, than has so far been used and telling the real news of the pass system in these advertisements. It is believed that by showing by figures just how the use of the passes is growing and by telling specific instances of people who have found the use of the passes a big saving and who by using passes have been able to get home during the noon hours when they were formerly unable to do so, more will be done to popularize the pass than could be done by any amount of plain, unadorned urging of folks to buy the cardboards.

HOW THE *Journal-Gazette* ARTIST SAW THE PASS IN A PLAYFUL MOMENT

It is interesting to know that the adoption of the pass system on the Fort Wayne city lines of the Indiana Service Corporation has been welcomed by the operators of the cars—most of the lines are one-man car lines—and that the use of the passes has greatly expedited the loading and unloading of cars.

Passes are on sale by operators and conductors from Fridays to Mondays and are also on sale at the Alter Cigar Store and the Riegel Cigar Stores at the "Transfer Corner," where all the city lines meet, during the same period. The number of passes sold by the cigar stores is negligible, but by having the passes on sale at these stores the corporation gets more publicity for the stunt and this having the passes on sale there also has a psychological effect toward popularizing the use of the passes.

The newspaper advertising space used by the corporation was partly paid for in transportation. Each month the corporation settles up on a cash basis for the transportation used by the papers and the advertising it has used.

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Express Service Defeats Jitneys

THE way to beat the attractive features of competing jitney service is to offer features equally or more attractive! That is the theory of the officials of the United Electric Railways, Providence, R. I., and it seems to be working out in their recent experiment of fast express service between Providence and Pawtucket.

For several years the passenger-carrying automobiles, jitneys and motor buses have been making heavy inroads into the revenues of the street car lines in and about Providence. There is a steady flow of traffic at all times between Providence and its near neighbor Pawtucket, a city of textile mills, about 4 miles away. Into this traffic the automobiles cut heavily. A veritable flock of jitneys throng the "Loop" at Providence and when they secure a load start off for Pawtucket.

On Jan. 16 the United Electric Railways inaugurated an express service and advertised it thoroughly by means of dasher signs and the press. Express cars leave each end of the line every ten minutes all day. They make stops to receive and discharge passengers only in the center of the two cities, running without stops outside of the congested district. They start just ahead of the local cars, and so make the run without delay.

The run of 4.1 miles is made in eighteen to twenty minutes, depending on traffic conditions. The fare is 12 cents. This is a little faster than the motor buses, which charge a 10-cent fare. The jitneys, so called, which are ordinary passenger touring cars, independently operated, make it in about fifteen minutes, but charge a 15-cent fare. As the jitneys do not start on any schedule time, but wait for a paying load, the regular ten-minute starting schedule of the railway offers a favorable factor of dependability.

White dasher signs 21 x 22 in. are carried on all the express cars. They have large red letters calling attention to the special service. These signs read as follows: "Ride on the cars between Providence and Pawtucket. Time-saving express service now in operation."

Officials of the United Electric Railways are enthusiastic over the results already secured. They assert that patronage on this line already has doubled.

Valuation of Public Utilities for Taxation*

An Outline of the Wisconsin Ad Valorem System of Valuation for Taxation Purposes Is Presented—Why a Rate Valuation Is Not Applicable as a Basis to Compute Taxes

BY EDMUND J. BRABANT
Public Utility Statistician Wisconsin Tax Commission, Madison, Wis.

GAS, electric and street railway companies in Wisconsin are paying in taxes approximately 25 per cent of their net income which would otherwise be available for interest and dividends. In 1910 these companies paid in taxes $548,500. For the year 1921 they were called upon to pay $2,473,000—four and one-half times as much as in 1910. The total assessed valuation increased from $58,749,635 in 1910 to $117,503,422 in 1921. The average rate of taxation has increased from .01125 in 1910 to .02106 in 1921.

The question is sometimes asked, "What is the use of taxing public utilities at all if the facts are, as commonly stated, that the public pays the tax? Is not this the same thing as taking money out of one pocket and putting it into the other?" The answer to this question, however, is quite obvious to anyone who will give the matter a little thought. Even in communities where the widest use is made of the service offered by the utility there remains a large proportion of the tax-paying public who make little or no use of it. Then it must be remembered that rural communities do not have as a rule an opportunity to obtain service. So that, if this property were exempted from taxation, the deficiency caused by such exemption, which would have to be met by increased taxation of other property, would fall upon all taxpayers, user and non-user alike. In my opinion all public utilities should be taxed, including municipally owned utilities. The failure to charge taxes against a consumer in the case of municipal utilities is unfair to all other taxpayers who are unable to obtain service.

Taxes in 1920 were more than ten times what they were in 1880, while the population of the state had merely doubled in the same period. To put it in another way, government cost each individual in this state in 1880 $6.92, and in 1920 $36.58. This, of course omits all federal taxation. Unfortunately the increases are not evenly spread between different years. That is in 1919 the increase over the previous year was 37 per cent. On top of this in 1920 there was another increase of 24 per cent. We are now enjoying what may be called a lucid interval, the increase of 1921 over 1920 being but 1 per cent. The average rate applicable to public utilities for the year 1922 will be $21.16 per thousand while in the year 1921 it was $21.06 per thousand.

The Tax Commission is not, of course, responsible for levying taxes. The Tax Commission is, however, responsible for valuations put upon the property of public utilities which it assesses, and must be held accountable to the owners and operators of these properties and to the public for valuations in accordance with law and equity.

The support for the activities of the state government is derived largely from taxes paid by these companies. There has been no levy upon the general property of the state for state purposes since 1913. Mill taxes paid to the state treasurer for education and highways, while often spoken of as state taxes, are not in fact used by the state government. The state merely administers these funds for and distributes them to the local units. The classes of companies valued and assessed by the tax commission with the amounts of valuation and taxes on each for the year 1921 are as follows:

ASSESSMENTS AND TAXES—PUBLIC SERVICE CORPORATIONS IN WISCONSIN, 1921

	Valuation	Taxes at .02106389
Railroads	$345,559,000	$7,278,816.75
Street railways*	74,085,000	1,560,518.20
Telegraph	4,825,000	101,633.27
Express	500,000	10,531.94
Sleeping car	1,600,000	33,702.22
Freight line	1,350,000	28,446.79
Improvement	375,000	7,898.95
Water, gas and electric	43,418,422	914,559.86
	$471,712,422	$9,936,107.98

*Includes gas and electric utilities operated in connection.

WHY A SPECIAL SYSTEM IS USED

The system in Wisconsin for the taxation of public utilities is known as the ad valorem system; that is, valuation is the basis for computing the tax. Most of the states of the union have a species of ad valorem taxation of public utilities, although a few, of which our neighbor, Minnesota, is one, seem to prefer the license fee system, that is, a tax on gross revenue. Wisconsin discarded the license fee system about twenty years ago. The trouble with the system in this state was that there was constant complaint that public service corporations were not paying their proper proportion of taxes. Attempts to increase the rate of the license fee met with determined opposition on the part of railroad companies. They claimed that in view of the fact that intangible property, consisting of

*Abstract of paper presented before joint meeting of Wisconsin Gas Association and Wisconsin Electrical Association, Milwaukee, Wis., March 23, 1922.

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stocks, bonds, mortgages, bank deposits, and money, practically escaped taxation, that the railroads in comparison, when taking into account this property, were paying more than their share of taxes under the license fee system. The failure of the attempts in the Legislature to increase the license fee over 4 per cent, which was then being paid as a maximum, resulted in the adoption of the ad valorem system. It was felt that the only way of putting public utilities and other property on an equal basis for taxation was to apply so far as possible the same methods in their taxation. So valuation became the basis for these properties as well as the general property of the state.

The word "valuation" as applied to the property of public service corporations in this state, as well as in several other states, requires explanation, interpretation and qualification. It is clear that the word as used in our laws does not always carry the same significance. The statutes require valuations to be made for several different purposes:

1. Taxation.
2. Rate making.
3. Purchase by municipalities.
4. Capitalization.

The statute specifically requires that the property and franchises of all these companies are to be assessed at "true cash value," but you will look in vain to find any direction as to how this true cash value is to be ascertained. While the statute lists a multitude of data which must be reported, it does not specify which are most important or significant, or what is to be the basis of the valuation. Neither does it require a classification of the properties included in the valuation. For example, no separate classification is required of tracks and cars in the case of electric railways, or of the generating plant, transmission lines and distribution systems in case of gas and electric plants.

The law with reference to the assessment of real and personal property is somewhat more specific. As to real property, the statute directs that it shall be assessed "at the full value which could ordinarily be obtained therefor at private sale." This has been construed by the Supreme Court to mean not such price as would produce a purchaser, for that would manifestly be a forced sale, but such value as could ordinarily be obtained by an owner assuming that he desired to sell, and that there was a purchaser with means desiring to buy.

Franchise and Going Value

Undoubtedly among the reasons for placing public service corporations in a special class for valuation and assessment is that under the law they enjoy special privileges, among which are right of eminent domain and in most cases virtual monopoly, these being inherent in the nature of the business. These rights and privileges may and often are of considerable value over and above investment in property. In other cases, they seem to be worth little or nothing. The statute specifically requires that value of franchises, if there is such a thing, be included. Furthermore, the system set forth in the statute evidently contemplates that these companies shall be valued as going concerns, and not as so many parcels of real estate and items of equipment. In fact, it must be admitted by every one that a street railway, electric or gas plant, is something more than mere land, rails, cars, wires and machinery. It is a live, going business, guided by brains and having rights and privileges which give it an organic unity. The theory of our ad valorem tax law as applied by the Tax Commission was upheld by our Supreme Court in an exhaustive opinion involving the first valuation for assessment purposes of railways (Chicago & Northwestern Railroad vs. State, 128 Wis. 553).

The meaning of the word value as taken for tax purposes is market or exchange value. Now, in putting a price on a parcel of land, a residence or business block, the customary manner is to ascertain at what figure similar properties have sold. Such value in the long run is based on the opinion of the public, or more particularly, persons who stake their money back of their judgment. There is no better guide than this to market value. It is the basis of the method employed by the commission in fixing the value of real estate in the state equalization. Unfortunately for the Tax Commission, the larger public utilities, unlike other properties, are rarely sold as units. When transferred, it is usually by the sale of stocks and securities. Where these are quoted on the market, they afford one means of determining value. This method would be sufficient and adequate without other data perhaps were it not for the fact that as only a portion of the stocks and bonds of a given company are sold in any one year, it is questionable whether prevailing prices would hold in case a controlling interest were offered for sale. Besides this, the securities of any public utility usually represent not only property useful in the public utility business but also investments made in securities of other corporations and other investments having no relation to the public utility business. For these reasons, additional methods must be employed for comparison and verification even where the data are available. They are, in fact, not available for most of the street railway and electric companies assessed by the commission.

Capitalization of Net Earnings

This method is based on the same theory that obtains in valuing annuities; that is, that the capital value of a given annual income may be computed, providing the length of time such annuity is to run is known or can be approximated. Now earnings of public utilities, unlike annuities, are not uniform. They fluctuate from year to year, depending upon a variety of circumstances, management, markets, labor, local conditions, and the general trend of business. Furthermore, it must be kept in mind that it is not past earnings which really give value to these properties, but the value of future earnings, and this means earnings over a period of years. Of course there is no way of measuring future earning capacity except by past performance. The period taken has usually been five years. Averages of net earnings are computed and capitalized at various rates.

Rates of Capitalization

The rates of capitalization employed being based on the rates demanded by the investing public necessarily cannot be uniform as to all classes of public utilities, nor even as to companies of the same character. Regularity, uniformity and stability, as well as amount of earnings, have an important bearing on the rates expected by investors. As a general rule the larger the company the less fluctuation there is in earnings. For this reason, the large interstate railways have been put in a special class, and the lowest rates have been applied to them. These rates range from 6 to 6½ per cent. In assessing street railways and light, heat and power companies, the rates have ranged from 6½ per cent to 8 per cent, depending on the hazard of the investment and the stability of the enterprise. Last year, the rates used were somewhat higher and ranged from 7½ per cent to 8 per cent. In a few cases involving small plants even higher rates were used, it being apparent that the revenues were large, and future prospects unattractive.

Depreciation

In using this method, it must be borne in mind that, notwithstanding the rules of accounting prescribed by regulating bodies, there are marked variations in methods of financing and management, all of which affect net earnings as reported. It is therefore highly essential that in using this method of valuation the accounts should be looked into rather closely, in order to get at a correct statement of a net revenue. It would be manifestly unfair to capitalize the net earnings of a company as reported where no depreciation had been taken, as this would give entirely too high a valuation, as compared with the company which was taking a liberal amount. In practice the commission has added to or deducted from the net earnings of all companies assessed in order to put them on an equal basis in the matter of depreciation.

Investment

In the determination of valuation of public utilities for purchase, original actual cost, that is, what has gone into the property, has usually been considered a most significant factor. This

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does not hold true as to valuation for taxation, for the simple reason that the original cost of a public utility does not necessarily represent its cash or market value any more than the cost of anything else represents its real value.

There has been no complete appraisal in recent years of the properties of public utilities in Wisconsin. From time to time the Railroad Commission makes appraisals for fixing rates, etc., which valuations are of course subject to examination by the Tax Commission. Our practice has been to take the last appraised value, and to add cost of improvements and extensions, and this is taken for the purpose of our records as the cost of reproduction of the physical property. The total cost of reproduction less depreciation of such properties as shown on our records is $107,311,467, and the total true value for assessment for the year 1921 is $111,444,229.

Non-Paying Properties

There are a good many cases where the commission has no data relating to stock and bond quotations, and where there are no net earnings to capitalize, as the companies are running at a loss. There were five street railway companies in 1921 which reported deficits from operation, and in addition to this there were several others whose earnings were so low as to be insufficient to meet taxes and interest. Where these companies are operated in connection with light, heat and power companies, they have an advantage in this state. This is due to the fact that in arriving at valuations on the unit property including the street railway any deficits which may be suffered from operation on the street railway are deducted from the net shown by the light, heat and power property. It is impossible to state separately what the exact taxes are on the street railways proper, where they are assessed along with electric and gas properties. Our computations indicate that the percentage of taxes to net earnings runs about the same as for electric light properties in the case of companies operating street railway systems separately. In the case of non-paying properties, it has been the custom of the commission to assess them at greatly below the cost of reproduction. We have endeavored to ascertain if there was any future for properties of this kind, and if possible, what the owners would be willing to sell them for.

Comparison of Valuation for Rate and Tax Purposes

From the inquiries which are occasionally presented, it is evident that many people are uninformed as to the methods used by the Tax Commission in arriving at the valuation of public service corporations. There seems to be an impression not uncommon that the valuation is based largely upon the cost of reproduction of the physical property. The principal basis for a valuation for rate purposes is the investment in or, in case this cannot be ascertained, the cost of reproduction of the physical property. The owners cannot be allowed and have not in well considered cases been allowed to earn profits on anything more than such actual investment or cost of reproduction. Their claims in some cases of a right to earn on what was formerly considered valuable franchises, good will, increases in land valuation or capitalization of earnings have been denied. But your rejoinder may be, "Is not this amount invested or cost of reproduction really the value of the property in view of the fact that these companies are absolutely limited by the state to nothing more than the fair rate of return which is fixed by the state?"

This seems somewhat reasonable, but let us look at what is meant by fair return. As stated before, the purpose is to allow a high enough return to induce capital to develop new enterprises of this character. It must be remembered that the state or federal government, while it limits the profits of public utilities to a "fair return," does not ordinarily guarantee that or any other return. If the public or the local industries do not take advantage of the services; if the cost of the service is more than was anticipated; if the business does not develop as was expected, it is the investor's loss. The state will not reimburse him. In any private enterprise, the ever present danger of loss is offset by the possibility or probability of attractive profit. The attractiveness of investments in private enterprise must, therefore, be offset to some extent in the case of public utilities. The possibility of loss in public service enterprises must be met by the same inducement. A rate of return must be allowed which will attract capital sufficiently to brave the possibility of loss. For example, suppose that investors were willing to take the securities of electric lighting plants already established and with business worked up, say at 7 per cent. They naturally would not be willing to go into new enterprises with additional hazards on the same basis. So, to attract capital, a margin over 7 per cent must be allowed by the rate making body. Suppose this margin is 1 per cent so that the return upon which the rate schedules are based is 8 per cent; that a given utility with business established does actually earn 8 per cent. What is the result from a valuation standpoint; that is, from the standpoint of the investor? There can be but one result, and that is, that the investment or the stock, if it coincides in amount with the investment, will climb above par; that is, it will command a premium in the market. This is what actually takes place. A fair return, therefore, is such a rate as will draw capital into established public service business plus such additional percentage as will invite capital into new enterprises along this line. Such a return when realized has the effect of increasing the actual or market value of the property. The actual or market value of the property, we will assume, was originally the same as the investment. At that time the valuation for rate and tax purposes should have been the same, but from that time on, with increases in business, it may never be the same again.

The foregoing indicates one of the important reasons why the same valuation cannot be used for rate making and taxation. There is, however, further reason. The purpose of a rate increase is, of course, to allow the utility a greater rate of return. The purpose of a rate decrease is to cut down the rate of return. A valuation fixed with these purposes in mind does not always work out as expected. There have been cases where rate decreases instead of cutting down the rate of return have tended greatly to increase the earnings and the rate of return upon the investment. In other cases, increases in rates have failed to increase the earnings or the rate of return. This has been found to be true recently in the case of street railways where people simply refuse to ride under the increased fares.

Another thing with reference to rate regulation should be mentioned. In this state it has been found impracticable to make wholesale changes in the rates of public utilities. As a usual thing changes are made only when a complaint or petition is filed either by the company or by a citizen. When these complaints are filed, there is usually a careful and comprehensive study made of the situation. It would be impossible to devote the necessary time to all of the utilities at the same time; to study all the varying conditions and to change all the rates. The Tax Commission, however, is required under the law to assess a large number of public utilities every year. The tax valuation can be determined with satisfactory accuracy in much less time than the valuation for rate making. It would seem from what has been said heretofore that it is unnecessary to argue that an increase in earnings increases the value of a public utility; that whenever the Railroad Commission makes a change in the rate of any particular utility, this sooner or later will have some effect upon the market value of the property.

From the foregoing discussion I think a logical deduction may be drawn: That the so-called "fair valuation" for rate making is a misnomer. It may be fair, but it is not strictly speaking a valuation at all but rather a finding of cost—investment—what has gone into the property. What we are trying to arrive at for taxation is what is the market value—the actual value—and that depends on what can be got out of the property.

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Experiences Exchanged by Members of C. E. R. A. Engineering Council

Mechanical and Way Department Men Discuss Wheel Diameter, Electric Welding of Wheel Flanges, Contact Devices, Bearing Metal and Allied Topics at Toledo Conference

A NUMBER of pertinent engineering topics were thoroughly discussed at a round table meeting of the Northern Section of the C. E. R. A. Engineering Council held in Toledo on March 14. Besides the chairman, the meeting was attended by eighteen railway men interested in mechanical and way matters. The principal assigned topics on which the experiences of the different ones were exchanged pertained to the adaptability of 26-in. wheels for city and lightweight cars, the building up of worn wheel flanges by electric welding and the relative merits of the sliding contact shoe and the trolley wheel.

Small Wheels Satisfactory Under Light Cars

In the discussion on whether or not the 26-in. wheel is the proper size for city and lightweight interurban cars, it developed that practically all the representatives had used this size wheel and found it to be satisfactory. A. Swartz, Community Traction Company, was of the opinion that the 26-in. wheel was satisfactory under city cars weighing from 16 to 20 tons. E. B. Gunn, Western Ohio Railway, who has recently made some investigations along these lines, said that he was convinced that this type of wheel was practical for interurban service. The Cincinnati, Milford & Blanchester Traction Company and the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad have been using lightweight cars for some time equipped with 24-in. wheels with satisfactory results. On the former roads three lightweight cars for one-man operation were installed over a year ago and the 24-in. rolled steel wheels at the end of thirteen months continuous service showed but little wear, and in this time it has not been necessary to remove a wheel. The power consumption for these cars has been but 1.1 kw.-hr. per car-mile and the general maintenance has also been very low. The Cincinnati, Lawrenceburg & Aurora was also getting about the same results. After witnessing the demonstration of the new lightweight cars recently purchased by the Kentucky Traction & Terminal Company, Mr. Gunn stated that he was very enthusiastic over this type of car and expressed himself as being in favor of the 26-in. rolled steel wheel under this type of car.

J. F. Collins, Michigan United Railways, said that he had had no trouble whatsoever from 26-in. wheels under Birney safety cars. In regard to safety cars in general, agreements on several other points were reached, and the meeting as a whole favored double-end control for one-man cars. The question of whether or not one or two trolleys should be carried on the Birney and similar types of cars was settled in favor of one pole.

The conclusion reached was that the 24-in. wheel was thought inadvisable on account of the close clearance after wear followed by turning, but all agreed that the 26-in. diameter wheel was entirely satisfactory and practicable. The council accordingly recommended its use under lightweight interurban and city cars.

Steel Wheel Flanges Can Be Repaired by Welding

The discussion on the practice of building up worn flanges on rolled steel wheels by electric welding was rather limited. Mr. Gunn and Mr. Heckler were the only members present who had done this work on wheels in use on interurban cars. Mr. Heckler remarked that with one pair of welded interurban wheels he had had good success, but owing to local conditions it was too expensive a practice to follow. Mr. Gunn, in relating his experience with the Lincoln machine for building up flanges, stated that he had been doing this work for the past three and a half years with excellent success. In this time only three wheels have shelled. The machine is used on the regular trolley voltage, but some trouble is experienced from the voltage fluctuation. He is contemplating installing a direct line from the substation to the shop to eliminate this drop. Mr. Gunn attributed his success largely to the care and skill of his welder and he is also of the opinion that the type of machine he is now using is the best for this work. The maximum wear is obtained by placing the welded wheels under freight trailers after they have been taken from motor car service. The Western Ohio Railway is not only welding its own wheels but has also built up a number of motor car wheels for the Dayton & Troy Railway and the Dayton & Western Railway. No recommendations were made on this subject because experience in this line had been confined to a limited number.

The Sliding Shoe Versus the Trolley Wheel

A number of interesting points were brought out on the relative merits of sliding contact shoes and trolley wheels. Mr. Rankin, Community Traction Company, said the experience of his company was limited in this respect, but foreign cars entering Toledo were having trouble with the dewiring of sliders because it was almost impossible to adjust switch pans for the accommodation of both wheels and shoes. It is not feasible to use both types simultaneously on the same overhead system. Mr. Savage, Detroit United Railway, remarked that a steel sliding shoe of the company's own pattern and manufacture was being used on the entire system with the exception of one division. When worn out these shoes are scrapped, since they can be produced cheaper than they can be reclaimed. In two-car operation their life averages from 1,300 to 1,800 miles, while a trolley wheel in the same service gave about 400 miles. When using the slider, the trolley pole tension is adjusted between the limits of 15 and 20 lb. The practice of regularly greasing the trolley wire where the shoe is used has been found helpful in facilitating backing up and lessening the wear on both the slider and the wire.

On the Northwestern Ohio Railway & Power Company lines E. E. Johnson said the Chapman sliding shoe was being used with good success, the life of which averaged about 6,000 miles. Mr. Shyrock of the same company added that the use of this shoe had reduced overhead maintenance by about 30 per cent and had not caused any trolley breaks since its installation on all equipment has been complete. It is also the practice of this company to assist the slider in backing up by greasing the wire at the regular meeting points of cars.

There was general agreement that interurban roads would adopt the sliding contact shoe for all their equipment when the manufacturers are able to bring out a shoe that will meet all requirements, particularly that of successfully backing.

Special Bearing Metal Gives Good Results on Western Ohio

Following the discussion of the assigned topics, Mr. Gunn related his experience with the United Lead Company's Frary metal. The Western Ohio Railway installed four of these Frary metal bearings for test purposes in a passenger motor car on July 25, 1921. After making 40,000 miles each one had lost approximately 3 oz. in weight. Even with considerably less oil than is required by regular babbitt bearings, these bearings kept the axles polished and in good condition. In a 1,000-mile test run without any lubrication whatsoever, he said that the metal did not melt and run out but powdered out. After testing a few bearings of this type Mr. Savage said that he had ordered some fifty more for the purpose of making his test more conclusive. He was of the opinion that the use of this bearing metal would wipe out their bearing trouble entirely.

Helical gearing also came up for comment. The subject was closed with the general conclusion that helical gears had no particular advantage over the older type, and in fact a number of the representatives showed preference for the straight spur gears and pinions.

In response to an inquiry by one of the representatives as to the average rate at which bonds could be installed, it was brought out that one type of machine operated by a crew of three men had a capacity of about sixteen bonds per working hour. It was the

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experience of Mr. Gunn that about seventy-five bonds could be placed in a day by one operator using a Lincoln type bonder and welder on a push car. When using a freight or passenger car the train crew assisted in the work so that an average of from 300 to 350 bonds per day could be installed.

Rail Cars Finding Place on Steam Railroads

New York, New Haven & Hartford Official Gives Operating Experience—Three Cars Now Making Almost 350 Miles Each Day

IN a paper on Australia and its railways, F. M. Whyte, at the February meeting of the New York Railroad Club, explained that motor cars with internal combustion engines were being used there successfully on lines of light traffic. Such cars seem to be favored for service on outlying sections where traffic is not only light, but where fluctuations in demand are not wide.

The need for extensive experimental development in the rail car was pointed out by W. L. Bean, mechanical assistant New York, New Haven & Hartford Railroad. Mr. Bean said that the automotive industry must venture considerably and be willing to develop vehicles of greater capacity, speed and comfort.

Three rail cars are now operated on the New Haven property, with the results shown in the table. One of the cars, which seats thirty-five passengers, went into service Jan. 3, and makes two round trips on a branch 15 miles long. The speed between terminals, including three stops, is 25 m.p.h. The average of 1.2 minutes delay per trip is considered not excessive for breaking in a piece of equipment of radically new design, especially in midwinter.

The second car is operating on runs which require speeds on various schedules from one end of the line to the other from 19 to 23 m.p.h. This car runs, with frequent stops, over grades up to about 1 per cent for considerable stretches and over a very crooked line.

A third car went into service on Jan. 3 and until Jan. 30 made only about 20 miles a day. Since then it has averaged 146 miles a day, on schedules that range from a speed of 20 to 26 m.p.h.

In concluding, Mr. Bean said that the New Haven experience gave its officials confidence that there is a large economy available through gasoline rail equipment. The development should be rapid and along good engineering lines in order that there may be no serious setback and that no one gets loaded up with unsatisfactory equipment. The need for unit cars is impressive, particularly on branch lines, where engines are kept under steam, frequently from one washout period to another, and only make 30 or 40 miles per day. The field of economy is great if a rail car can be developed that will compare with a motor truck on the highways in reliability, in the saving in fuel, in the saving in wages and in the saving in attendance other than operating wages, to say nothing of possibilities in maintenance cost reductions.

RAIL CAR OPERATING DATE, N. Y., N. H. & H. R. R.

Operation Started	Average Daily Mileage	Average Operating Speed, M.P.H.	Total Train-Miles	Average Delay Per Trip, Min.	Passenger Data — Total	Per Trip Average	Per Trip Max.	Per Trip Min.
January 3.....	146	20–26	2,661	1.2	4,443	....	73	10
January 18.....	60	25	1,497	1.2	2,118	21.2	38	3
January 30.....	137	19–23	.....	0.4	1,467	27.2	66	10

Difficulties Confronting Electric Railways in California*

Short Franchises, Heavy Taxation, Paving Burdens and Unfair Automobile Competition Delay Electric Railway Development—Public Opinion Becoming More Favorable to Electric Roads

BY W. V. HILL
Manager California Electric Railway Association

THERE are thirty-four electric railway companies in California operating 3,140 miles of single track with 5,736 cars and employing 17,544 men. The investment in these properties is approximately $350,000,000. Their gross receipts in 1920 were close to $50,000,000, and their deficit for that year was $1,244,337, according to the report of the Railroad Commission. During 1920 they carried 624,991,946 passengers. California ranks fifth in point of mileage, cars operated and passengers carried on electric railways.

When the electric car replaced the horse car it succeeded to all of the obligations incurred by its predecessor with compound interest, including the obligation to pave and repave the tracks and for 2 ft. on each side thereof. With the advent of the automobile and trucks, the expense of track construction has grown from $5,000 a mile during the early days to $143,000 per mile in some of the cities in California. Notwithstanding the tremendous increase in this and in all other costs of operation, the little old nickel carfare that was charged thirty years ago is still doing duty in San Francisco and on one of the lines in Los Angeles.

FRANCHISES ARE BURDENSOME AND SHORT LIVED

With the exception of Oakland, the franchises in the larger cities are limited to from twenty to twenty-five years. In San Francisco the city reserves the right to take over the property without payment therefor and has taken over some of the lines and paralleled others. In Los Angeles the city agrees to pay for the property if it desires to take it over at the expiration date. You can appreciate the difficulties of financing a property of forty or fifty-year bonds with franchises that run about one-half of the life of the bonds and with all the uncertainties that are liable to arise, and have arisen, at the expiration thereof.

In addition to the paving charge, there are other obligations in the franchise. They vary somewhat to meet local situations, but the more important provisions are contained in all.

Take Los Angeles for example: Twenty-one year limitation; right of city to purchase; may grant extensions of three years; grantee must pay 2 per cent of gross receipts to city (this in addition to state tax of 5¼ per cent); grantee must carry free on cars city officials, policemen, firemen and mail carriers (free rides on the Los Angeles Railway amounted to 4 per cent of the total travel in 1920); grantee must use heavy girder rail and track construction, including paving, in accordance with plans and specifications of the City Engineer; grantee must give transfers to all lines operated, and a 5-cent fare is stipulated. The Railroad Commission, however, has been vested with jurisdiction over fares. There are requirements to build culverts at street intersections where curve tracks are constructed; there are restrictions as to the kind of cars used, the service performed, the hours service must be performed and many other minor restrictions. These are a few of the requirements to which a company must agree when it accepts a franchise to operate an electric railway.

Is it surprising that the electric railways have failed to keep abreast of the development of this wonderful state? I think I speak conservatively when I say that there should be 5,000 miles of electric lines in operation in this state today properly to care for the transportation needs of the people.

There should be a drastic change in our system of granting franchises and this power should be vested in the State Railroad Commission. It is too large a problem for the average city hall politician to handle; it is a state problem, for after all most of the electric railways operate in more than one city. The Pacific Electric, for instance, operates in fifty-two incorporated cities and towns. Just imagine conforming to the different franchise requirements of these municipalities. It reminds me of the conflicting ordinances in Los An-

*Abstract of address presented before California Real Estate Association, Los Angeles, March 25, 1922.

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geles and Pasadena relating to smoking on cars. A passenger wanting to smoke on a car operating in and between these cities is required to start smoking on the front end in Los Angeles and go to the rear end when reaching Pasadena. I expected South Pasadena to require smokers to sit in the center of the cars, for they never could agree with Pasadena or Los Angeles on anything as a rule. The Railroad Commission now has jurisdiction over fares, rates, service, finances, accounts, extensions and abandonments of electric lines, and in order to work out these important problems it should have jurisdiction over the granting of franchises, for after all the franchises are the foundation of the structure, and unless that is made secure it will be impossible to finance further extensions, and the officials responsible for these properties have already come to the conclusion that they cannot hope to place them in a sound financial condition and render adequate service to the public until the franchise problem is remedied.

Bus and Auto Truck Competition Is Serious

While the large number of privately owned automobiles are responsible to some extent for our loss of revenue during the past six or seven years, yet we do not feel we have any grievance with this class of competition, for the highways and paved streets were built by the taxpayers for this kind of traffic.

On the other hand we have some 800 companies and individuals operating about 2,500 large buses and trucks as common carriers over these highways (which we are being taxed to help build and maintain), doing a business estimated to be close to twenty millions annually—or about one-third of the gross business of the electric railways—destroying these highways without paying anything in the way of rental or taxes therefore, excepting a pittance of a motor vehicle tax, and nominal licenses imposed by less than 10 per cent of the cities and counties in the state. Of all the impositions ever placed on an industry, I consider this the worst. C. A. Whitmore, a member of the State Highway Commission, in a recent speech, clearly expressed the situation when he said:

> A peculiar paradox exists in California. We raise the money to meet highway bonds and interest from taxes on railroads and public utilities. With this money we build highways which are now used by automobile transportation lines in competition with the railroads. The competition reduces the revenues of the railroads and reduces the income which accrues to the state, with a part of which it builds highways. The state furnishes almost free a roadway for one common carrier out of money provided by taxation of another. Obviously this situation cannot continue. Highways cannot be maintained under circumstances like these.

Mr. Whitmore also stated that it was costing about double the amount per mile to care for the 5 per cent (trucks and buses) of the vehicles using the highways. In other words, they could build highways for $25,000 a mile that would withstand the traffic of 95 per cent using them, but it would cost $55,000 per mile to build highways that would withstand the other 5 per cent of the traffic.

The Highway Commission in its last report said: "The chief need for the heavier duty highway comes from the truck and auto passenger traffic. We believe that present laws should be amended to place a larger burden of maintenance cost on this particular class of traffic."

Public Sentiment Changing

A feeling is growing throughout the state that we have been given a raw deal by the taxpayers subsidizing our competitors with a free right of way and the non-payment of state taxes, and if this sentiment continues to grow, as reflected in more than a hundred editorials appearing recently in as many papers, we have hopes this injustice will be soon corrected. About one-half the county boards of supervisors and numerous chambers of commerce have petitioned the Railroad Commission not to grant any more permits where they compete with rail carriers, for it is now realized by public-spirited men that it has resulted in the impairment of service and in some cases the entire abandonment of lines, and that after all no community can thrive without a dependable transportation service.

So far these bus and truck operators have utterly failed to render as satisfactory service as that performed by the rail carriers, but have taken just enough revenue away from them to make it impossible for the rail carriers to maintain their former high standard of service and meet the demands of the public in making extensions in keeping with the progress of the state's development. Until the franchise burdens and the injustice of this subsidized competition are corrected the electric railways cannot hope to board the bandwagon with you again and take their rightful place in the future development of this wonderful state.

Technical League Prospers

THE Technical League of Milwaukee, which is one of the activities of the Employees' Mutual Benefit Association of the Milwaukee Electric Railway & Light Company, and was organized in December, 1919, reports that during 1921 its membership practically doubled. Meetings are held monthly in the Public Service Building, usually preceded by a supper.

During the year, out of seven papers read before the league, five were presented by company employees. The assistant general claim agent discussed the work of the claims department; the general auditor, that of the accounting department; the chemist, that of the chemical and physical laboratory, and so on. Other addresses were given by the local resident engineer of the Wisconsin Railroad Commission and a prominent banker formerly intimately connected with public utility work.

At the annual meeting prizes were awarded to a transportation department man for a paper on "Power Saving as a Factor of the Transportation Department Bonus," and for papers on "Electric Characteristics of the Electric Steel Furnace," "The Three-Truck, Two-Car Train," "My Job and I" and "Essentials of a Service-at-Cost Contract.

American Association News

Way Committee Holds Well Attended Meeting

THE committee on way matters held its second meeting for the year at association headquarters in New York City on March 29 and 30. In attendance were: W. F. Graves, chairman; H. H. George, vice-chairman; R. C. Cram, sponsor; C. A. Alden, V. Angerer, E. B. Entwisle, W. R. Dunham, Jr., C. F. Gailor, E. P. Roundey, E. M. T. Ryder, F. Tingley, W. W. Wysor, G. C. Hecker, E. J. McIlraith, H. M. Steward, W. C. Emory and F. A. Weymouth. The items covered are segregated below by subject assignments:

Standardization of Branch-Off Frogs and Car Clearance Curves—The proposed standardization scheme for branch-off frogs, as submitted in Plan B Appendix A of the 1921 report, was discussed. The general opinion was that this should not be approved. The proposed tables and data for car clearance curves presented last year as Appendix C was approved with addition of a drawing to assist engineers in making selections for varying street conditions. This material will be offered for approval as a recommended design. The tables are to be amplified with data covering the use of clearance curves for tracks of other than standard gages.

Proper Location of Tongue Switches in Turnouts, Crossovers and Branch-offs—Drawings were submitted and approved for adoption as recommended design.

Design of Curved Treads for Wheels and Study of Design of Flange and Tread Contours—These subjects had been combined to facilitate discussion with the committee on equipment. It was decided that a set of three flanges of different heights but uniform thickness be suggested for discussion at the meeting of the equipment committee on April 6. The view was expressed that treads should be at least 3 in. wide and that 2½-in. wide treads should be used only when conditions will not permit a wider tread. A suggested compound tread contour applicable to all treads regardless of flange depths was to be discussed with the equipment committee also. The object of this is to secure a uniform contour of contact

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surface, more nearly in conformity with actual conditions found in the contact between worn wheels and worn rails.

Revision of Specifications for Girder Rails in Respect to the Method of Tests and Review of the Engineering Manual—An exhaustive study was stated to have been made of the manufacture of the steel test balls proposed for use with the modified impression test as originally suggested by the A. S. T. M. A slightly revised draft of the modified impression test was approved for adoption in place of the drop test. The manufacturers advised that they would continue to make the drop test or would substitute the impression test. Mr. Weymouth, for the A. S. T. M. subcommittee, stated his belief that the A. S. T. M. would accept the modifications proposed. A suggestion for change in the present specification for splice bars was also presented. The present specification will be set aside and certain A. S. T. M. specifications for splice bars are to be substituted. These cover all grades of hardness from the soft steel desired for use with seam welded joints to the high carbon bars of a nature similar to those provided by the existing specifications.

Designs of Substitute Ties—The subcommittee on this subject reported that it is preparing a statement of the controlling factors of design from data received.

Investigation of Arc-Weld Joints—The committee devoted detailed study to the design of a proposed machine for making an accelerated form of test of these as well as other joints. The manufacturers of welding equipment will be asked to devote their metallurgical studies to the question of the best methods of producing a satisfactory top seam. A statement was made to the effect that the committee on welded rail joints is compiling data from its recent questionnaire. A general meeting of this committee will probably be held late in April.

Wood Preservation—The sub-committee reported that some data from Europe are being gathered on the use of sodium fluoride as a preservative. Papers describing several timber treating plants of member companies are being prepared.

Review of Report of the American Committee on Electrolysis—Under this head there was some discussion of the definition of "stray currents." The matter was assigned for conference with the power distribution committee.

Specifications for Sundry Track Materials—On this subject the committee decided to suggest adoption of the A. S. T. M. specifications for tie plates, track bolts, ordinary hookhead and screw spikes. The specification for tie rods is to be considered further.

Dimension of Frogs—A set of angles and lengths for standard frogs used in turnouts in split-switch and tongue-switch construction was adopted for submission as recommended design.

Design of Track Construction in Co-operation with the A. S. M. I.—The sub-committee reported on correspondence had with a sub-committee of the A. S. M. I. It is hoped to arrange a joint sub-committee meeting soon.

Special American Association Reports and Compilations

THE following list of reports, which are available to members on request, has been issued by Executive Secretary Welsh.

Financial and Operating Statistics: Combined reports of approximately 175 companies showing complete income statement, operating expenses by departments, on various unit bases including operating and traffic ratios.

Motor-Bus Operating Costs: Gives operating figures for Chicago, Washington, D. C.; Lincoln, Neb., and a comparison of the relative costs of operation of motor buses, trolley buses and one-man cars.

Recent Official Valuations: Summary of commission decisions in valuation cases occurring since January, 1921, giving details of values found and the principles followed in determining them.

Fare Changes on Interurban Properties: Gives present fares in effect on interurban lines, changes that have occurred in past year and method of effecting change, *i.e.*, whether by increasing mileage rate, increasing zone rate, rearranging zones or other methods.

Depreciation Decisions: Summary of depreciation rates fixed by public utility commissions. This is a supplement to compilation of the same name issued June 1, 1921.

Metal Tokens: A list of companies using metal tokens, showing size of token and rate at which they are sold.

Printing Transfers: Showing companies that print their own transfers, number printed, type of transfer and cost of printing.

In addition to the above, supplements to the wage bulletin, the fare bulletin and the cost of living studies have been prepared bringing them down to date.

Help the Mail Pay Committee

THE Post-Office Department has recently mailed to all electric railway companies in the country that handle United States mail a series of forms calling for information necessary to enable the Interstate Commerce Commission to decide the petition recently filed before it, Docket No. 10227, by counsel for the committee on mail pay asking for increase in mail pay.

The American Electric Railway Association committee on mail pay has been in consultation with the Post-Office Department on this question, ironing out differences and reaching agreement on the method of procedure and scope of data needed. These efforts have been conducted for the department by Joseph Stewart, special assistant to the attorney general, and former second assistant postmaster general, and for the electric railways by L. H. Palmer, chairman, and W. H. Maltbie, counsel, of the committee on mail pay. The results are contained in the forms just sent out with a pamphlet of instructions.

Executive Secretary Welsh, of the association, has mailed to all companies copies of the petition filed with the Interstate Commerce Commission and two circular letters of explanation.

As the department desires operating data based on April, 1922, the compilation of the data called for on the forms cannot be completed until after May 1. As soon as possible thereafter, with the prompt co-operative efforts of the railway companies, an analysis and summary of the figures will be made and the case prepared for argument before the Interstate Commerce Commission.

Chairman Palmer states that the mail pay committee expects to develop some interesting and authoritative data on the relation between service provided as measured in seat-miles operated and the ratio of use of same. It hopes to show the costs of providing space for carrying mail both in pouches and compartments so that this difficult question may be solved once and for all. Finally the committee is sanguine that it can prove the inadequacy of the existing rates and the justice of an increase therein. None of these desired ends can be accomplished, however, says Mr. Palmer, without the co-operation of the mail-carrying electric roads in filling out the forms accurately, completely and promptly. Further work must be done in tabulating and analyzing the information after it has been forwarded to the Department and the counsel for the committee.

Merchandising Transportation

A MEETING of the committee on merchandising transportation of the T. & T. Association was held at association headquarters in New York on March 31. Those in attendance were E. M. Walker, chairman, Terre Haute; K. A. Simmon, East Pittsburgh; Victor S. Curtis, New Haven; W. H. Boyce, New Brighton, and J. B. Stewart, Jr., Youngstown, Ohio.

The meeting was devoted principally to deciding on the scope of the report for the October convention.

Busy Days for Committees

DURING the past week the Engineering Association committees on power distribution and equipment each held two-day meetings, largely attended, in New York City. The committee on purchases and stores was also scheduled to meet. Reports of these meetings will appear in a later issue.

Among coming meetings already scheduled is a two-day meeting of the buildings and structures committee, April 10 and 11, at Cincinnati, Ohio, and a one-day meeting of the committee on heavy traction, on April 19, at association headquarters.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Bacharach Bill Opposed

Public Opinion Aroused Over Measure Which Would Curtail Courts' Powers Over Commission Decisions

It would seem from the attitude of members of the judiciary committee of the House of Representatives that there is little chance of success for Representative Bacharach's bill to limit the jurisdiction of Federal courts in matters pertaining to state public utility orders. Still it appears likely that the bill will be vigorously sponsored. A further hearing on the bill will be held April 25.

In explaining the object of the legislation, Mr. Bacharach said:

> This bill seeks to amend the judicial code of the United States so as to compel utility corporations dissatisfied with the findings of the state utility commissioners to carry their cases through the courts of the state and then on to the Supreme Court of the United States if necessary. The enactment into law of this bill would not deprive utility companies of any of their just rights for they have every protection afforded them in the high type of men who compose the membership of the higher courts of the various states.

To enact such a bill as that proposed by Mr. Bacharach would be highly injurious to the public welfare, in the opinion of Everett T. Wheeler, of the Jurisprudence and Law Reform Committee of the American Bar Association. Among other things he brought this opinion to the attention of the committee:

> We often hear criticisms upon the writ of injunction from those who feel its effects, but in my judgment it is just as beneficial and important for the public welfare as the writ of habeas corpus. It prevents parties from taking the law into their own hands and provides for a continuance of existing conditions until a competent court has adjudicated the rights of the parties.

Former Senator Charles S. Thomas, of Colorado, says that he cannot conceive of any law that is more iniquitous than the legislation proposed. Mr. Thomas said:

> This bill is designed to reach a class of cases which will result from legislation existing or to be enacted in the future that will challenge the application thereto of such provisions of the Constitution as the fourteenth amendment. It seeks to deny to the Federal Courts the right to preserve the property and the rights of individuals pending the determination of the constitutional question and thereby in my judgment impinges upon the fourteenth amendment.

One of the most able of those who spoke for the bill was Clyde M. Reed, chairman of the Kansas Public Utilities Commission. This was the high point of his argument:

> It is not in the interest of public policy for the government to interfere where a body has been created under the state law for the benefit of the states laws and the state judicial bodies. If a constitutional question is involved, they can appeal to the Supreme Court of the United States.
>
> We have had in Kansas during the last eight or ten years a very large volume of litigation over these questions invoking the state courts and Federal courts and many of these cases have come direct to the Supreme Court of the United States. Usually the state power has been upheld but there has been a very considerable interference in the meantime by the lower Federal courts.

Paul V. Keyser, Des Moines, representing the Investment Bankers' Association of America, said that if the suggested legislation be adopted, it will affect very materially the value of securities already issued and outstanding. In addition, it would have a direct and immediate effect upon the credit of the utilities in respect to all additional capital requirements.

William Chamberlain, of Cedar Rapids, Iowa, representing utility companies in Iowa, Illinois, Indiana, Michigan and Tennessee, said in part:

> I think that it would be a serious thing to the finances and to the development of the utilities in the entire middle west to have a law passed which would take away from investors the protection of the Federal courts. I think that the result would be that in the financing of the utilities in the West you would practically drive away many millions of dollars which would otherwise be available for development.

Wage Reduction Accepted

Recently a wage reduction approximating 8 cents an hour for trainmen was placed in effect by the Pacific Northwest Traction Company and the Puget Sound International Railway, operating in Everett, Wash. The Pacific Northwest Traction Company operates the interurban line between Everett and Seattle and the Puget Sound International, the railway lines in Everett.

The old rate of wages paid trainmen by the Pacific Northwest was 58 cents an hour for the first year, 63 cents an hour for the second year and 68 cents an hour for the third year. The new rate is 50, 55 and 60 cents an hour. The present rate of wages on the city traction lines is 48 cents an hour for the first year, 52 cents for the second year and 56 cents an hour for the third year.

These reductions were accepted by the trainmen voluntarily following a conference with executive heads. This schedule prevails until 1923.

Traction Companies Will Save Through Centralized Plant

Power for all railway systems in Dayton, Ohio, soon will be supplied by the Dayton Power & Light Company. All but one of the five Dayton companies have been producing their own power heretofore, and in the case of this one exception, only part of the power was supplied. The Dayton power company some months ago secured a contract by which it will furnish all of the energy for the Indiana, Columbus & Eastern traction line. For a number of years it has supplied the Dayton & Troy, Dayton & Western, Dayton, Springfield & Xenia, and the Springfield and Xenia traction lines. In order to take care of these additional power contracts the company plans to spend more than $2,000,000 in extensions and improvements.

Election Result Awaited

Municipal Interests Planning Ahead, but Withholding Action Pending the Election

Little interest has been displayed in the railway situation by residents of Detroit, Mich., since the agreement was reached by the company and city officials regarding the purchase plan that will be voted on by the electors on April 17. The street railway officials are awaiting the outcome of the election before proceeding with their plans although little doubt is expressed that the purchase plan will be accepted by the voters.

While no financial statement has been given out for the year ending Dec. 31, 1921, covering the operation of the municipal railway lines, the revenues from operation have been satisfactory to the street railway commission and the municipal officials. The first municipal cars were operated over short sections of lines in February of last year and the first sections were put in operation for service only without the expectation of revenue until the lines were made into a more complete system by connecting the various sections. The crosstown lines have grown in importance until lines that at first showed receipts of only $200 a day are now producing $1,300 and $1,600 a day.

The opening of new city lines has changed somewhat the routes taken by some of the car riders and a study is being made of the traffic conditions with a view to determining future extensions in the way of branch lines and connecting links, to be constructed in carrying out the program of expansion. Schedules have been changed from day to day on certain lines to meet the requirements of the riders as they became accustomed to and used the new routes traversed by the M. O. lines.

While the proposed use of trolley buses in connection with the municipal system has not been abandoned, the commission has decided that no further steps will be taken to establish trolley bus lines until the more important problems pertaining to the main lines have been worked out so as to make the need of buses more evident. The idea of using buses has not been abandoned and new developments of importance are looked for in connection with trolley bus equipment. Gas buses are not looked upon with favor by the commission as it is believed that under the existing conditions on the lines contemplated gas buses could not be operated satisfactorily on a 5-cent fare. As noted elsewhere in this issue the municipal railway is preparing specifications for 200 Peter Witt cars with the idea of buying this new rolling stock if the city takes over the D. U. R. lines.

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Scores City Jurisdiction—Commends State Regulation

N. W. Simpson, member of the Missouri Public Service Commission, in a speech delivered before the St. Louis Rotary Club on March 9 declared that if the people of St. Louis insisted upon a cut in electric railway fares, which are now 7 cents, they would have to "stand up for a slash in wages." He said that not only should the public utilities be permitted to earn a reasonable return on their invested capital, but they should also be allowed enough money on which to operate.

Mr. Simpson referred to the old days when politics played so important a part in readjustments, when a man who was running for office did so on the promise that he would have fares cut or gas rates reduced. He said that the commission had ended all this. Mr. Simpson said in part:

> When the cities controlled public utilities they did not do it properly. State supervision was the answer. Would the United Railways have so large an amount of stocks and bonds outstanding against it today if the State had been supervising its operations? Franchises cannot cover the relations of the utilites with the public. The commission is needed.
>
> The public is woefully ignorant on questions in which public utilites are involved and the cities were decidedly recreant to the trust placed in them. This trust never will be returned to the cities unless there is some absolute assurance that the control will be exercised judiciously.
>
> The hardest work the commission has to do is to undo the bungled job that the cities did when they controlled utilities. Trying to untangle these knots has put gray hairs in my head. The utilities want more money, the public wants lower rates and the investors want more dividends.

Commissioner Simpson flayed the city press for its misinformed criticism of the utilities. He said he had just read an editorial on a subject on which he happened to be well posted, and he found that the editorial writer knew nothing about the subject. He said that he suspected he was the man who had been writing certain other utility editorials.

Wage Controversy Settled

A wage agreement has been signed by the East St. Louis & Suburban Railway, East St. Louis, Ill., and its many members of the Amalgamated Association, ending a controversy that has lasted for a year and litigation which has been in the federal courts for several months. Under the contract the men get 51 cents an hour, until May 1, 1923. This is the same rate of pay they have been receiving pending the settlement. Up to July 1, 1921, the men received 70 cents an hour.

The employees demanded 65 cents an hour. After the men submitted their demand a board of arbitration was named. The arbitrator representing the company resigned before the board rendered a decision. The company then obtained an injunction restraining the board of arbitration from rendering a binding decision, as it attempted to do through the two remaining members, the union's agent and a third party. Since the injunction was granted the employees have been working at 51 cents an hour, and the contract just signed by President W. H. Sawyer, continuing the scale for thirteen months, has been ratified by the union.

Transportation Commission Reports

Sees Bright Prospect for San Diego Property—Transportation of Passengers Necessary Part of City Building

Declaring that the San Diego (Cal.) Electric Railway has a bright future if properly managed, and condemning some of the practices in the past of the company, the citizens transportation commission of San Diego appointed last fall by Mayor John Bacon, made its report to the City Council on March 27. Among the more important recommendations made in the report were suggestions that the city create a Public Utilities Commission, consisting of three members, one to be a paid executive, to supervise operations of all public utilities, but especially transportation; the consolidation of all transportation lines into one company; discontinuance of the 2 per cent municipal franchise tax; relieving the company of obligation to pave between car tracks after 1930; and that the company begin reconstructing its lines without delay. The commission also takes a stand against the zone system of fares, recommending that the 5-cent fare for all points between the bay and the eastern boundary of the city be restored as soon as the company's earnings justify.

A change in management of the company was recommended, which recommendation, the commission added, had already been complied with. The commission also opposes the plan whereby the J. D. & A. B. Spreckels Securities Company, owner of the railway company's stock in exchange for 2 per cent of the gross receipts, furnished the railway's operating and accounting staff.

The commission report says that the San Diego Electric Railway lost $15,000 in operating the Point Loma Railway in 1920, and broke even on that line in 1921. The San Diego company operates the Point Loma company's line at a rental of 10 cents per car mile and normal maintenance, for use of track and trolley. The commission also thinks the railway paid excessive charges to the San Diego-Coronado Ferries company when it paid $12,000 in 1921 for use of terminals at both shore approaches to the ferry. Both the Point Loma company and the Ferry company are owned by the Spreckels.

The commission commends the use of one-man cars for light traffic, and recommends the use of the auto bus for furnishing transportation to districts not sufficiently populated to justify the laying of tracks.

"Transportation of our people is as necessary and integral part of city building as gas, water, sewer, police and fire station service," the commission report states, and recommends that the interest of the city in the welfare of the company should not be sporadic or occasional, but constant, constructive, energetic and reasonable. The report says:

> These companies demand security for their investments and a fair return in interest. This is as it should be, but the other equation is the city's right to demand the greatest degree of efficiency and economy in the conduct of that business. The people should know that the men administering these public trusts are capable and honest and serving the public no less zealously than the stockholders. In the last analysis their masters are the people and the stockholders jointly and equally.

The commission pointed out that any extravagance in management, any waste, or any franchise tax or paving charge against the company, meant a higher fare to the commuters. The commission declared that the San Diego system is helping to pay for the building up of Tent City (Coronado line) and Ocean Beach (Point Loma line) resorts, and that this is unjust, and a fare should be charged on these lines to make them self-sustaining, thus aiding toward a lower fare on San Diego city lines.

$75,000 Saved by Want Ad

Car riders were saved $75,000 by a "want ad," according to officials of the Cleveland (Ohio) Railway, which has just won a damage suit for this amount.

The "want ad" was used to get information about lapses of consciousness suffered by Mrs. Helen Bachman, 5600 Hough Avenue, N.E., who sued the company for $75,000 as the result of an accident in which she was squeezed by the door of a Wade Park car on March 20, 1920.

Mrs. Bachman, who was wheeled into court, maintained that her condition is the result of the accident. During the trial Mrs. Bachman submitted to "pain tests," in one of which a bandage was slipped from her head, and she showed no sign of emotion when a doctor drove a needle into her arm. As soon as the bandage was replaced, she became apparently fully conscious.

After an article appeared, telling of the "pain tests" in the court room, one of Mrs. Bachman's neighbors reported to Cleveland Railway officials that Mrs. Bachman had suffered in a similar way before the accident.

The company placed a "want ad" in a newspaper asking for information from other persons who knew of Mrs. Bachman's condition. Several appeared in response to the "ad" and testified that Mrs. Bachman had suffered lapses of consciousness prior to the accident. The jury returned a verdict in favor of the company. The case was heard before Judge Maurice Bernon.

"That little 'want ad' saved the street car riders of Cleveland about $75,000 to apply on the fund that will help reduce the present rate of fare," says Paul E. Wilson, secretary of the Cleveland Railway.

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Agreement Being Drawn to Provide Trackless Trolley

Counsel for the United Railways & Electric Company, Baltimore, Md., and for the Liberty Roads Improvement Association are preparing a formal agreement regarding the trackless trolley service from Gwynn Oak Junction to Randallstown. The association has notified the United Railways that the fund of $32,500, required by the company to protect it from operating at a loss during the first five years, had been raised.

As soon as the agreement is signed, the company will set about securing the necessary licenses and franchises, ordering the buses, and erecting the poles and wires. Three trackless trolleys will be purchased.

Under the agreement the residents of the section will guarantee the United against loss up to $10,000 during the first year of service, $7,500 during the second, and $5,000 during the remaining three years. By that time it is hoped that the territory will be sufficiently developed to support the line. A 14-cent fare will be charged on the line, and there will be no transfer privileges.

$575,000 Program of Improvements for Tampa

Increase of the Tampa (Fla.) Electric Company's capital stock from $2,879,800 to $3,454,800 to provide funds with which to finance extension and improvements to its property is proposed and a meeting of the stockholders will be held in Tampa on May 2 to ratify the decision of the board to go ahead with the improvements and to increase the stock for providing funds. Altogether $800,000 will be spent by the company in new construction, improvements and extensions, according to T. J. Hanlon, Jr., manager. Improvements include:

Construction of additional trackage on the Nebraska Avenue line to permit increased service. This is to include double-tracking of certain parts of the line so that ten cars may be operated on it. Additional turnouts and double tracks are to be installed in Jefferson Street from the county jail to Nebraska Avenue.

Track changes on the Union station line to permit of Birney car operation. This will include double track in Seventh Avenue from Twenty-second Street for a considerable stretch and will permit cars to operate on an eight-minute schedule during rush hours. In addition approximately 4 miles of new track will be laid on various lines about the city, double tracking present lines.

Purchase of twenty single-truck Birney cars for use on the Ross Avenue and Union station and Ballast Point lines, and for additional rush hour use on city lines. Ten of the new cars are to be delivered in July and the other ten in October.

Purchase of four double-truck cars for the Port Tampa line.

Additional storage and repair facilities to take care of this new rolling stock.

Establishment of substations in Gary and Sulphur Springs from which the supply of electrical current will be distributed.

Installation of a 600-hp. boiler and boiler accessories, pumps, etc., at the West Jackson Street power plant, which will make the sixth power unit at this plant.

Construction of a new store room and employees' room on part of the vacant property at the West Jackson Street plant.

One of the most important features of the program of improvements is the plan to place underground the light and power wires and cables leading from the east cable house at Whiting Street to remove danger of interruption of service from high water in the cable house or from fires in the lower down-town district. This item will cost approximately $300,000.

Labor Statistics Published

The *Monthly Labor Review* for February, 1922, contains a summary of a report by the Joint Commission of Agricultural Inquiry, which was created during the summer of 1921 to investigate agricultural conditions in the United States. According to the summary the inquiry covered "the condition of agriculture and the factors which caused it, the adequacy and effectiveness of the credit machinery and resources of the country transportation and marketing and distribution." A comparison is made of the average annual earnings of employees usually engaged in several of the leading industries in the United States for the years from 1909 to 1918, a comparison also of the value of these earnings at the prices of 1913 and their relative purchasing power. Included in the table are the following statistics on the average annual earnings of employees normally engaged in the electric railway, light and power, the telegraph and telephone industries.

Year	Current Money	Value at Prices of 1913	Indexes of the Purchasing Power of Annual Earnings. Base, 1913
1909	$623	$653	96.3
1910	638	653	96.3
1911	641	652	96.2
1912	652	656	96.8
1913	678	678	100.0
1914	683	676	99.7
1915	666	647	95.4
1916	732	665	98.1
1917	790	613	90.4
1918	878	556	82.0

Augusta Matters Unchanged

The situation in Augusta, Ga., has remained practically unchanged since the Augusta-Aiken Railway & Electric Corporation took its cars from the streets on March 16. The City Council at its last meeting referred the matter back to the committee on traffic and transportation. It appears now to be generally recognized that affairs are reaching a point where some constructive action will have to be taken soon.

Efforts have been made by city officials to regulate the jitneys, which are now the only means of transportation. There is some dissension among the jitney operators themselves in regard to the present situation.

Will Investigate Monthly Pass.—The Public Utilities Committee of the City Council of Seattle, Wash., has asked Superintendent of Railways D. W. Henderson to investigate the success of the monthly pass system in use on the Youngstown (Ohio) Municipal Railway.

Progress Seen in Trackless Trolley Plan

Such progress has been made in adapting a Brill trackless trolley for the Minneapolis (Minn.) Street Railway that the starting of its use on the Bloomington Avenue line from Thirty-eighth to Fortieth Streets is expected about April 15. Some of the changes made for the Minneapolis car, which is likely to be standard hereafter due to the logic of the development is a 36-in. wheel instead of 34-in., thirty seats instead of twenty-eight, one steel trolley pole instead of two of wood, a track shoe by which the car may be operated back to the company station from the end of the line.

T. Julian McGill, vice-president of the railway, believes from experiment that a trackless trolley must be constructed so that it will fit into all operations of the trolley system, otherwise it will be a mistaken policy to adopt use of such equipment. This car may be operated at a maximum of 12 ft. from the tracks in operation over the regular trolley routes back to the station, where emergency may require a detour to be made to avoid an obstruction.

The steel trolley pole with twin wheels to fit the double wire is believed to be an improvement of the original plan for a double wood pole. The company is operating successfully a motor bus as a crosstown line from the end of the Second Street line N.E. to the end of the Fremont Avenue line N., intercepting the Camden place line en route.

Plan for Removal of Traffic Danger Suggested

Los Angeles, Cal., will be 3½ in. above the danger mark in traffic accidents if the plans of a member of the Greater Los Angeles traffic commission are adopted. These plans are now in the hands of the commission for investigation. They provide for safety "islands" 3½ in. above the street, 30 ft. long, and surrounded by 18-inch lamp posts. These "islands" would be placed at each street intersection where cars stop, and would eliminate the possibility of automobiles driving into the space designated by the traffic department for boarding street cars. Another plan involves the erection of curbs 6 in. high at street intersections, running parallel to the direction of traffic, to guide four streams of traffic, two in each direction. This plan, if adopted, would eliminate the possibility of autoists crowding into streams four and five abreast and imperiling lives of pedestrians who must use the street intersections.

Los Angeles now has from 80,000 to 100,000 automobiles tributary to the congested district, and the registration for 1922 in California exceeds 700,000 automobiles, and it is estimated at least one-fourth of these will be seen on the streets of Los Angeles.

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Taxpayers' Appeal Taken Under Advisement

Seattle's Municipal Railway controversy came one step nearer settlement recently when the Supreme Court of the State took under advisement the appeal of the "fourteen taxpayers" in their suit to enjoin the city from invading the general tax fund for operation and maintenance of the railway. The case was heard by the Supreme Court, en banc. Attorneys for the taxpayers contended that the city was under no obligation to tax the city generally for operation and maintenance of the street railway or to retire the $15,000,000 bonds which the city gave for the purchase of the system; that the city had no power to levy a general tax for such purpose, but that it was intended to tax by directing a portion of the general fund to the operation and maintenance of the railway. Counsel for the city of Seattle contended that the city was under no obligation to tax, but that it has the power to tax, although it has no intention of so doing.

George T. Donworth, appearing as a friend of the court, a citizen of Seattle and of the State of Washington, argued that the statutes and the constitution provided against the creation of a general indebtedness for the operation of the street railway system except by popular vote, and that no such vote had been held in this case.

Plan to Resume New Orleans Negotiations

Security holders of the New Orleans Railway & Light Company, New Orleans, La., are ready to proceed with a settlement of the company's troubles on the same basis proposed last November. This was the declaration of C. C. Chappelle upon his arrival in New Orleans to represent the security holders. He will be followed in a few days by G. M. Dahl, vice-president of the Chase National Bank, and a final settlement of the problem is expected to be reached shortly after his arrival.

Mr. Chappelle is quoted as follows:

The city of New Orleans and its people are to be congratulated that the recent decision of the Supreme Court of Louisiana establishes home rule in reference to regulation and control of its local public utilities.

The city now has full power and authority to dispose of its utility problems upon constructive and permanent lines.

I am here to co-operate, as in the past, with the Commission Council to reach an understanding whereby the New Orleans Railway & Light Company can be reorganized into a new concern—a New Orleans institution, which can be financed and kept financed through the years to come, adequately to serve the public at reasonable rates.

We were in substantial accord when negotiations were interrupted last November, upon all matters vital from the city's standpoint—valuation, rate of return, limitations upon the issuance of securities, and upon disbursements to existing securities—hence, it would seem matters should be concluded speedily.

An enormous amount of legal routine and detail is necessary to bring about a reorganization. Therefore, an early and definite understanding between the city and the security holders as to the basis is essential to real progress.

The security holders, who will undertake the responsibility of reorganization, are ready to proceed and I have taken matters up with Commissioner Maloney.

The arrival of G. M. Dahl, vice-president of the Chase National Bank, in New Orleans, La., is being anxiously awaited by the members of the Commission Council so that the conference which was interrupted by action of the Supreme Court last fall may be resumed. The members of the Commission Council are ready and willing to begin where they left off in the conference as soon as it is agreeable and convenient for Chairman Dahl to do so. Meanwhile, however, all sorts of reports are afloat. The chief of these is that the Commission Council will oppose the rate of return of 7½ per cent on the valuation fixed by agreement and will insist on a lower rate of interest.

It may be stated authoritatively that these rumors are misleading. The only objection that has been voiced against the rate of return has been that of Mayor McShane, who has called upon the railway for certain data upon which he is alleged to base his opposition to the points already agreed to by the conferees. The other members of the commission are noncommittal and disposed to deal as fairly with the railway as they are with the public in general.

News Notes

Approve Queensboro Subway.—Committee of the whole of the Board of Estimate of New York, N. Y., has approved the tentative proposal for an appropriation of $4,000,000 for the Queensboro subway from Grand Central station to Eighth Avenue and Forty-first Street.

Company Claims Damages.—As a result of the Nova Scotia Legislature adopting the bill changing the "drive to the left" rule to "drive to the right," the Nova Scotia Tramways & Power Company, Halifax, N. S., has claimed compensation to the amount of $50,000. It is said this amount is necessary to change tracks, cars and snow sweepers.

Investigates Grade Crossings.—Investigation of grade crossings in Tiffin, Ohio, was ordered by the City Council on March 14, upon petition of a large number of residents. Safety Director George T. West was directed to probe conditions following complaints that rail crossings are left unguarded where there are no gates.

Examinations Announced.—The United States Civil Service Commission announces an open competitive examination for tax examiner specialist. The salary for this position ranges from $2,400 to $3,600. Receipt of applications will close on May 9. The commission also announces an open competitive examination for transitman on May 10.

Paving Suits Threatened in New York.—Borough President Julius Miller of Manhattan has disclosed that suits aggregating about $150,000 probably will be brought by the city of New York against the various traction companies operating surface lines to compel these corporations to pay for repaving and other repairs within the railroad area.

Meets on Wage Matter.—At Lima, on March 27, there was a meeting between B. J. Jones, receiver for the Ohio Electric Railway, which operates the Lima City Railway, and W. P. Anderson, J. C. Hutchinson and John Sweeney, arbitration committee appointed to adjust wage scale differences between the men and the company. A working agreement adopted last fall continues until August, but the wage scale terminated on Feb. 15. The men oppose a further cut in wages and ask for a slight increase. The committee ruled against any change.

Third Arbiter Selected.—Professor George W. Rightmire of Ohio State University, Columbus, Ohio, has agreed to serve as the third member of the board of arbitration which is endeavoring to settle the wage dispute between the Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio, and its employees. The other members of the board are C. W. Rich, Springfield, who was selected by the trainmen, and S. F. Hutchins, Columbus, selected by the company. These two agreed on Mr. Rightmire for the third member. The first meeting of the full board will be held at the company's office in Springfield on April 13.

Crews, 100 per Cent on Safety, Praised. — The Co-operative Welfare Association of the Louisville Railway and the Louisville Interurban Company gave a dinner and entertainment in honor of the motormen and conductors of the Brook Street car line who went through the month of February without a single accident. The festivity took place at "Safety Hall" at the Eighteenth and Walnut Streets carhouses. James P. Barnes, president of the railway, praised the efforts of the men and said that they were keeping up their good work for in the twenty-one days of March these same men had run 9,668 miles without an accident.

Fort Smith Awaits Settlement.—Meetings between the executive committee of the men and D. C. Green, general manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., have brought no concessions whatever from either side. The company is standing firm on its proposal of a separate contract for powerhouse men and trainmen; a cut of 6 cents an hour in the basic scale for carmen, and an additional cut of 3 cents an hour for swing run carmen; and the existing scale for powerhouse men and carhouse mechanics. The men are holding out for their original propositions: First, the same joint contract that has been in effect; second, the same contract, with a provision that any change in car fare would automatically open the wage scale to negotiations; and third, arbitration of the whole matter.

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Financial and Corporate

Rental Agreement Proposed

As Result of Court's Aid Readjustment Between I. R. T. and Elevated Will Go Before Security Holders

A tentative agreement has been reached between representatives of the Interborough Rapid Transit Company, New York, N. Y., and the Manhattan (Elevated) Railway which provides for a reduction in the 7 per cent dividend paid by the Interborough on $60,000,000, the fixed value of the Manhattan elevated lines, to 3 per cent for the fiscal year beginning July 1 next, 4 per cent for the succeeding fiscal year and 5 per cent thereafter. If the earnings of the Interborough system, subway and elevated lines, yield more than 4 per cent, the excess is to be divided between the two companies until the Manhattan again receives 7 per cent.

The agreement also provides for sacrifices by the Interborough. Its stockholders are to subscribe for $7,000,000 of new Interborough notes, and its bondholders are to waive the sinking fund charges to retire $160,000,000 of bonds. This waiver, which is expected to give the Interborough an additional $2,000,000 a year, the reduction in the Manhattan dividends, the money from a new issue of notes and other money to be gained by economies and new devices, will supply the Interborough, it is estimated, an average of $5,000,000 a year for five years. The Interborough has indicated that this sum would be needed to meet expected orders of the Transit Commission for increased service.

The agreement was the result of intervention by Federal Judge Julius M. Mayer, who appointed James R. Sheffield a trustee in bankruptcy of the Interborough Consolidated Corporation, the holding concern of the Interborough, to act as mediator.

The announcement that the Interborough would not continue to pay 7 per cent dividends to the Manhattan Company and the passing of two quarterly dividends aggregating $2,100,000 led to conferences between representatives of the Interborough and the Manhattan. No progress was made toward reaching an adjustment that would save the Interborough from a receivership. Two applications for a receiver have been pending before Judge Mayer and the time for their disposal was near.

Judge Mayer took charge of the matter in an extra-judicial capacity for the purpose of bringing the two groups together. The agreement must have the indorsement of the security holders of the two companies.

While the Interborough directors were trying to meet the financial difficulties of the company, Mayor Hylan introduced in the Board of Estimate a resolution calling upon the Transit Commission to declare the Interborough in default of its contract on the ground of inadequate service and to seize and operate the subways. The resolution also authorized Corporation Counsel O'Brien to proceed independently, presumably in the courts, if the Transit Commission did not comply with the board's mandate. The resolution, on motion of Comptroller Charles L. Craig, was referred to the committee of the whole for consideration.

The Interborough has also obtained a further extension upon the two applications for a receivership, one by the American Brake Shoe & Foundry Company and the other by the Continental Securities Company, the latter a minority stockholder action. The litigation involves an issue of $38,144,400 short term notes. Counsel for the Interborough said that only $721,000 of these notes had not been deposited for extension and Judge Julius M. Mayer of the United States District Court extended the time until April 28. He coupled with this order an additional order that any party in interest might apply for a receiver on an hour's notice.

Receiver Submits 1921 Report

Receiver O'Keefe of the New Orleans Railway & Light Company, New Orleans, La., has furnished Commissioner Maloney of the Department of Public Utilities with a report of the earnings for the twelve months ended Dec. 31, 1921. It makes a very good showing for the last three months of the year, when the population of tourists and winter residents was at its greatest.

The railway operating revenue for the year ended Dec. 31, 1921, was $8,845,876 and the expenses amounted to $5,790,269. The net operating income amounted to $2,322,354. The annual return based on the twelve months ended Dec. 31, 1921 and on proposed compromise valuation as of Dec. 31, 1920, was 6.1 per cent.

Surplus of $1,893 in Holyoke

At the annual meeting of the Holyoke (Mass.) Street Railway, on March 21, the directors were authorized to renew the lease of the Mount Tom Railroad, to expire in June next, on as favorable terms as could be arranged. The last lease was for twenty-five years at 6 per cent return on the capital. At the meeting Isaac E. Sawyer was elected a director.

Net earnings of the Holyoke Street Railway for the past year were $82,413, and after paying dividends at 6 per cent, amounting to $80,520, a surplus of $1,893 remained. Receipts and miscellaneous revenue totaled $1,104,250. Total operating expenses were $901,431, taxes $371,571 and interest $82,834, bringing total expenses to $1,021,836.

Buffalo Property Reports

International Railway Fails to Realize Fair Return—Traffic Falls Off—$3,000,000 for Improvements

The 1921 operating revenue of the International Railway, Buffalo, N. Y., last year was $10,721,279. This was insufficient by $1,186,562 to provide for maintenance, depreciation and renewals, operating expenses, taxes and a fair return upon the value of the property in accordance with a formula adopted by the Public Service Commission when it granted the 7-cent fare or four tokens for 25 cents for the city of Buffalo. This statement was made in the annual report of the company submitted to stockholders on March 28, 1922.

In brief the company sets forth that it inherited from horse-car days a continuing charge against its revenues for the paving of city streets. H. G. Tulley, president of the company, and T. E. Mitten, Philadelphia, chairman of the executive committee, contend in the statement that this charge is unreasonable and an unjustifiable burden upon the car-riding public and one that ought to be removed.

In touching upon service, the report says that 23,000,000 fewer passengers were carried in 1921 than in 1920. Schedules were adjusted to meet traffic requirements and unnecessary service was eliminated. This saving in operating costs offsets in part the loss in revenue. The report calls attention to the survey made in November and December by engineers of the Public Service Commission whose report recommended but 1 per cent additional service. The so-called old Buffalo and Niagara Falls line practically ceased to serve as a through route between these two cities when the modern high-speed line was placed in operation, according to the report which says that those sections of the old line between Buffalo and North Tonawanda and between Niagara Falls and LaSalle are needed for local traffic, but the intervening section between North Tonawanda and LaSalle parallels the high-speed line and represents wasted service, resulting in an operating loss of more than $150,000 per annum; this adding to the cost of transportation borne by the car riders, should, in the public interest, be eliminated. To avoid the expenditure of approximately $1,000,000 for municipal paving requirements and reconstruction of track, permission was requested and received from the commission, to abandon the line between North Tonawanda and LaSalle.

New working conditions affecting all hourly paid employees were adopted and made effective May 1, 1921, the report says, and adds that all rates paid employees working at unskilled occupations were adjusted to compare with those paid for similar work in the industries of Buffalo. The International Railway Company's Co-Operative Benefit Association was organized last year for the purpose of promoting true co-operation between men and manage-

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ment, and to provide protection to employees in the form of $1,000 group life insurance certificates and sick benefits of $1.50 a day. The membership dues were fixed at $1 a month, the company contributing each month to the funds of the association a sum equal to the aggregate amount of dues paid by members. Nine death claims and sick benefits to 160 members have been paid during the year.

The report closes the first year's operation of the International system under the Mitten Management, Inc., contract. Valuation of the company's property has been prepared for presentation to support the proposed application for a system basis of fare. Industrial relations have been much improved and the Co-operative Benefit Association so advanced in membership as to represent approximately 80 per cent of all employees. The property, it is stated, has been brought to a better state of excellence, with lessened accidents, and the number of suits pending reduced from 1,486 to 778.

W. S. Dunbar, comptroller of the company, sets forth in his report that existing tariffs for transportation over interurban divisions show wide variations. These rates originated largely through agreements made between municipalities and previous managements, prior to the formation of the Public Service Commission. Some of the fares are inadequate, Mr. Dunbar reports, in that they do not pay for the cost of service rendered.

It has, therefore, been recommended that a review of the entire rate structure be made, and a valuation of the system property as a whole be presented to the Public Service Commission with an application for a general adjustment of the rates charged on the International system; this in order to establish reasonable fares conducive to the maximum use of the cars, and productive of an adequate return upon the total investment in the combined system property. The expenditure incurred through improvements and betterments amounting to more than $3,000,000 entirely consumed the appropriation made from 1921 earnings for maintenance and renewals and approximately $500,000 of working capital provided by the stockholders.

Seeks to Abandon Line

The Pacific Northwest Traction Company operating out of Everett, Wash., has filed a formal request with the Public Service Commission for permission to abandon its line between Everett and Snohomish, over which no cars have operated since December of last year. Floods late last year caused damage that would require an expenditure of $60,000 to repair, and this the company is unwilling to spend, in view of the fact that the line has been operated at a loss for three years. The line is about 7½ miles long, 2 miles of which is owned by the traction company, and the remainder is operated under a lease with the Northern Pacific Railway.

Middle West Utilities Makes Report

The Middle West Utilities Company, Chicago, Ill., for the fiscal year ended Dec. 31, 1921, reports a total income of $3,441,561 and a net income of $1,616,326. The combined surplus earnings for the year, including $493,978 the proportion of the subsidiary companies' aggregate undistributed surplus, totalled $1,207,407. The total gross earnings of the subsidiary companies increased from $22,729,923 for the year ended 1920 to $26,348,234 for the year just ended. The company's balance as of Dec. 31, 1921, was $813,048.

The company refers to its activity with new properties during the year. It makes mention of its acquiring control of the Hydro-Electric Light & Power Company of Connersville, Ind., and also of its securing a controlling interest in the Ironwood & Bessemer Railway & Light Company, the Ashland Light, Power & Street Railway Company and the Big Falls Water Power Company. The report also includes a statement on the status of the company's ten-year 6 per cent collateral gold bonds, the three-year 6 per cent collateral gold notes and the five-year 7 per cent convertible gold notes. During 1921 the company gained approximately 8,000 new stockholders and 5,000 subscribers who are becoming stockholders. This was accomplished through the company's issuing and selling $4,375,000 in par amount of its 7 per cent cumulative prior lien stock. In addition, $1,591,600 par amount of prior lien stock was sold on partial payment plan to be issued when fully paid.

York Railways Planning New Property Acquisition

Negotiations are now pending by which the York (Pa.) Railways will ultimately get control of the York Haven Water & Power Company, located on the Susquehanna River at York Haven. This company has been closely associated with the York Railways and has an operating contract with the Edison Light & Power Company, by which an interchange of water power and steam power is effected, enabling the successful operation and development of the water power plant which formerly suffered from shortages due to conditions on the Susquehanna River, resulting in deficiencies which are now supplied by the steam plant of the Edison Company.

The officials of the York Railways, who also control the Edison Electric Light & Power Company, have been in conference with two groups of bankers located in Philadelphia. The deal involves about $500,000 or about 27,000 shares of common stock now held by Brown Brothers & Company, who hold the controlling interest in the York Railways, and the Edison Electric Light & Power Company.

The York Railways operates 85 miles of electric railway and controls the Edison Light & Power Company, which does a large electric lighting and power business. If the deal is consummated it will combine the three corporations —the York Haven Water & Power Company, the Edison Electric Light & Power Company and the York Railways.

The York Haven Water Power Company has a funded debt of $3,760,000 and $3,000,000 of stock at par. The plant generates 20,000 h.p.

The negotiations are being carried on by Charles R. Rhoads, a member of Brown Brothers & Company; Day & Zimmermann, engineers of Philadelphia; Janney & Company, bankers; Charles H. Bean & Company, bankers, and the York contingent.

Should the deal be consummated, the entire operation will be controlled at York, with local management and with Gordon Campbell as the probable responsible operating official in the capacity of president.

Valuation Case to Be Concluded

With the presentation of testimony as to intangible values, cost of promotion, consolidation and other items, the United Railways, St. Louis, Mo., expects to complete its side of the case at the valuation hearing before the Missouri Public Service Commission at Jefferson City, on April 17. At the recent hearing this phase of the case was opened.

Robert L. Warner, a New York financier, former vice-president of United Railways and an official of the North American Company, testified that there should be an allowance of 10 per cent for going value, 10 per cent for consolidation of the old lines, 10 per cent allowance to cover the expense of financing, and 10 per cent to cover the cost of promotion.

Frank O. Watts, president of the First National Bank, St. Louis, testified as to the allowance for financing, and stated that from 5 to 10 per cent would be a reasonable charge. Breckenridge Jones of the Mississippi Valley Trust Company gave similar testimony. Col. Albert T. Perkins, manager for the receiver of the United Railways, testified that not less than 20 per cent of the reproduction value of the property would be necessary to pay for promotion and financing. "No large amount of capital can be collected for consolidation purposes in handling transportation corporations without large bankers' and brokers' cost," he said.

The tentative valuation fixed by the commission for rate-making purposes is $50,000,000. Representatives of the corporation and also the receiver expect to show that the value is not less than $75,000.000. Manager Perkins, in his testimony, said that many things entered into a valuation of such property as that of the United Railways, besides the actual physical value. He cited the contract the United Railways holds with the Keokuk water power dam. "Financed at 7 per cent," he said, "this contract would represent a value in excess of $16,000,000." And yet, a few years ago, this contract was under vicious attack by newspapers.

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Stock to Be Issued to Cover Deferred Dividends

The directors of the Columbus Railway, Power & Light Company, Columbus, Ohio, on March 29 took the final step in the declaration of stock dividends on A and B preferred stocks and set March 31 as the date upon which the books will close. The dividend on A is 24.8 per cent and on B 2 per cent. The directors took the first step in declaring these dividends several weeks ago and their action was approved unanimously at a special meeting of the stockholders. Announcement was made that the stock dividend will be distributed as rapidly as the stock certificates can be made out.

The directors plan to hold a meeting about April 10 to declare a cash dividend on B. They will meet about June 10 to declare a cash dividend on A. The directors hope to pay a dividend on common later, but no date has been selected.

The Ohio Public Utilities Commission has approved the issuance of stocks of the company aggregating $1,288,996, so that the stock dividends could be paid. The commission gave its approval to the revocation of stocks and bonds of the company never disposed aggregating $774,900.

Abandonment Likely

Railway lines between Mechanicsburg, Carlisle and Cumberland County towns will probably be abandoned by the Valley Railways, Lemoyne, Pa., although some amicable arrangement is being sought. Residents of Carlisle have made a proposal which includes suspension of service on Hanover Street and the continuation of the present Harrisburg-Carlisle line to Cave Hill. The railway officials claim that the lines east of Mechanicsburg are the only ones which pay for operation and that eventually all lines west of Mechanicsburg will be abandoned. The company representatives will report the proposal made by the Carlisle people to the company's board of directors and will inform the Carlisle borough council of the directors' action before their next regular council meeting, April 13.

Ohio Traction Distributes Report

The first printed annual report of the Ohio Traction Company, Cincinnati, Ohio, to be submitted to stockholders was received on March 29. Heretofore the report has been read at the annual meeting, but no copies have been distributed among the stockholders. The report shows railway operating revenue for 1921 of $8,885,632, a decrease of $84,723. Net operating revenues were $2,979,695, an increase of $298,093. After taxes and rentals, excepting the franchise tax, there was a balance for the year of $1,079,232, or $298,093, greater than in 1920. Interest and sinking fund obligations took $686,117, leaving $393,115 available for return on capital, or $22,885 short of the amount of the allowance for capital return.

The report declares that the present rate of fare should be sufficient to provide the full return on capital for 1922. Passengers carried during 1921 showed a reduction as compared to the previous year, the number being 106,527,759, against 118,618,862 in 1920. The report estimates that there will be a surplus of $200,000 for 1922, which if realized will pay all but $133,000 of the accumulated deficit of the company under the service-at-cost ordinance.

The Ohio Traction Company owns practically all the stock of the Cincinnati Traction Company.

Seattle Shows Gain

Annual Report Shows Three Year Deficit of Municipal Railway Reduced to $1,526.869

D. W. Henderson, superintendent of the Seattle (Wash.) Municipal Street Railway has presented to Mayor Hugh M. Caldwell his annual report showing a gain of $378,824 resulting from operation of the railway system in 1921.

At the same time City Comptroller Harry W. Carroll made public figures showing that the deficit incurred from the operation of the railway for the three years since the Stone & Webster properties were purchased now stands at $1,526,869.

Mr. Henderson's figures of railway expense for the year include the large item for depreciation specified by the state accountants, $680,629, a book charge, while only $100,000 was actually set aside for depreciation. On the other hand, they do not include any monthly apportionment to meet the $833,000 annual payment to the owners of the system which was made on March 1, and which the Mayor has always considered in analyzing the financial condition of the railway.

Deducting the book depreciation charge from the total expense of the year, and adding the actual depreciation apportionment and the apportionment for redemption of bonds, the gain would be $326,453, it was pointed out.

SEATTLE MUNICIPAL STREET RAILWAY INCOME PROFIT AND LOSS STATEMENT YEAR ENDED DEC. 31, 1921

Operating revenues	$6,295,564
Operating expenses	5,105,487
Operating income	$1,190,076
Non-operating income	51,611
Gross income	$1,241,688
Deductions from gross income	866,846
Net income	$374,841
Losses accrued (other than income)	1,412
Income profit and loss income	$373,428
Delayed gains in prior period	53,133
Delayed losses in prior period	$202,673
Income profit and loss earned	$223,888
Unearned decrease of deficit by donations	2,700
Income profit and loss balance (credit)	$226,588

The operating expenses will check with the reports for twelve months of 1921 by adding $680,629 depreciation charge. $1,190 ground rental and the auto bus expense of $31,837, and deducting $12,079 which is an overestimated amount for industrial insurance.

Included in operating revenues are auto bus revenues of $16,964.

Fewer Passengers Carried

Superintendent Henderson's report showed that the total expense of the railway for 1921, including operating costs, depreciation and interest on bonds, was $5,951,385. The revenues for the year were $6,330,210. The municipal bus lines were operated at a loss of $14,872.

The total number of pay passengers carried on city cars during the year was 75,724,088, as compared with 98,824,369 in 1920, a difference of 22,916,386.

The report showed a marked decrease in the number of railway accidents. Car collisions decreased 106, collisions with automobiles decreased 433, derailments 125, and miscellaneous accidents 489. The total number of accidents decreased from 5,254 in 1920 to 3,972 in 1921, a difference of 1,282. The only increase reported was in the item of ejectments and disputes, which are listed as accidents, of which there were nineteen more in 1921 than in 1920. Such controversies between trainment and passengers in 1921 numbered 125.

Comptroller Carroll's figures varied somewhat from those of the superintendent. They credited the railway with a gain of $226,588 for the year, as compared with large losses during the two previous years. The loss in 1919 was $517,173 and in 1920 $1,236,283.

The capital assets of the railway, as shown by Comptroller Carroll's figures, on Dec. 31, 1921, were $15,205,588, the capital liabilities, $17,217,765, and the capital deficit, $2,012,176. The capital deficit, Mr. Carroll explained, is larger than the deficit for the past three years because of the deficit in the old municipal railway fund before the Stone & Webster properties were purchased.

Current assets of the railway, including materials and supplies and cash on hand, at the end of the year were $1,347,629, while current liabilities, including accounts payable and warrants outstanding were $922,901. The current surplus was $424,728.

In his calculations, Comptroller Carroll made the accompanying tabulation, comparing the three years of municipal operation of the general street railway system.

SEATTLE MUNICIPAL RAILWAY RESULTS

	1919	1920	1921	Total
Operating revenue	$4,114,885	$5,410,764	$6,295,564	$15,821,214
Miscellaneous revenue	43,268	52,628	51,611	147,507
Operating expense	4,067,902	5,585,301	5,105,487	14,758,691
Interest payments	607,424	865,660	866,846	2,339,931
Loss	517,173	1,236,283	.....	.....
Gain	.....	.....	226,688	.....
Deficit	.....	.....	.....	1,526,869
	1919	1920	1921	Total
Replacements and betterments	$ 193,217	$ 148,274	$ 146,074	$ 477,560

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New York State Railways Shows Improved Earnings

The New York State Railways, Rochester, N. Y., has reported railway operating revenues for 1921 at $10,692,263 against $10,454,410 in 1920. Operating expenses including $762,087 for depreciation in 1921 increased from $8,369,558 in 1920 to $8,511,376 in 1921. The 1920 expense figure included a depreciation amount of $567,554. From a net income of $568,854 in 1921 sinking fund appropriations amounting to $34,074 were deducted leaving a surplus of $534,780 against a surplus $397,047 in 1920.

James F. Hamilton, president of the railways, referred to the company's property in Rochester being valued tentatively at $17,500,000 and being finally fixed by the board of appraisers at $19,216,000. He alluded to the fare questions in Syracuse and Utica and intimated that a further reduction in wages was likely at the expiration of the agreement ending May 1, 1922. In discussing the earnings of the company, Mr. Hamilton said:

> While the company has earned a substantial amount available for dividends, these earnings have had to be used for corporate purposes. Conditions have been such as to prevent the sale of bonds for the refunding of bonds of the People's Railroad Company of Syracuse and of the Rochester City & Brighton Railroad aggregating $925,000, which when they became due had to be taken care of by issuing notes discounted at the banks.

In concluding his remarks to the stockholders Mr. Hamilton said the earnings were improving and he looked to the time when bonds would be sold to refund indebtedness and to reimburse the treasury for a certain amount of the expenditures on capital account which had been made from earnings. He was of the opinion that when this was effected it was to be expected that dividends could be resumed on the preferred stock and payment made on account of the dividends which have accumulated on that stock since 1918.

Receivership Lifted in Des Moines

Harris, Forbes & Company, New York, announce that the Des Moines (Iowa) City Railway, having completed arrangements for the satisfaction of its outstanding matured obligations, the properties of that company, for more than three years in the hands of receivers appointed by the United States District Court, by order of the court, have been turned back to the company. The company is now operating under a new franchise under which the rate of fare to be charged will be automatically changed from time to time, according to the costs of operation.

The bondholders' protective committee, representing the general and refunding mortgage 5 per cent bonds, due 1936, announces that upon presentation of certificates of deposit the bonds will be returned without charge to the depositing bondholders, together with interest due July 1, 1921, and Jan. 1, 1922, plus interest on overdue interest. Non-depositing holders may collect their overdue interest in the usual manner.

Financial News Notes

Valuation Fixed for Reorganization.—The valuation of the properties of Buffalo & Lake Erie Traction Company outside the city of Erie, Pa., has been fixed at $775,000 for reorganization purposes by the Pennsylvania Public Service Commission.

Increased Gross Earnings in Chicago.—Gross earnings of the Chicago (Ill.) Surface Lines increased from $55,016,348 in the 1920-1921 period to $60,343,733 during the twelve months ended Jan. 31. The total cost of operation amounted to $46,516,150 leaving $13,827,583 to be used for interest and surplus.

Approval of Security Issue Sought.—The Lafayette (Ind.) Street Railway, Inc., has petitioned for authority to issue $250,000 of stock, half to be preferred. The company bought, under federal court jurisdiction, the local railway property for $75,000. The petition says the company will buy new cars and improve the property.

Balance Decreases.—For the twelve months ended Feb. 28, 1922, the Republic Railway & Light Company, Youngstown, Ohio, reports gross earnings of $7,213,677, against $8,464,315 for the same period a year ago. The total income realized was $2,403,676, from which deductions amounting to $1,978,603 were subtracted, leaving a balance for depreciation, dividends, etc., amounting to $425,074, against $438,816 for the twelve months ended Feb. 28, 1921.

Gold Bonds Offered.—Halsey, Stuart & Company, Inc., and A. B. Leach & Company, Inc., are offering $1,000,000 of the American Public Service Company's first lien 6 per cent gold bonds due Dec. 1, 1942. The price of the bonds is 89 and interest, yielding about 7 per cent. Coupon bonds are offered in denominations of $1,000, $500 and $100. The American Public Service Company is controlled through stock ownership by the Middle West Utilities Company.

Passenger Revenue and Traffic Decrease.—For the two months of operation ended Feb. 28, 1922, the Philadelphia (Pa.) Rapid Transit Company realized a net income of $350,876 against $146,362 for the same period a year ago. The passenger revenue for the two months amounted to $6,446,479 a decrease of $246,494 over a total of January and February last year. The passengers carried totalled 130,660,707 for the two months of this year against 134,239,820 in 1921.

A Larger Surplus than Ever.—After all deductions the Eastern Pennsylvania Railways, Pottsville, Pa., and subsidiary companies realized a balance for the year 1921 of $393,065, which was transferred to surplus account, making the total accumulated surplus on Dec. 31, 1921, $1,020,895. According to the annual report of President Pardee this surplus was greater than for any previous year. The operating revenue increased from $1,932,751 in 1920 to $2,290,526 in 1921. The expenses, including taxes and rentals, increased $113,755.

Net Income of $980,838.—The income statement of the Brooklyn (N. Y.) City Railroad for the eight months ended Feb. 28, 1922, and 1921, was made public recently by H. Hobart Porter, vice-president. The eight months ended Feb. 28, 1921, include the strike period. For the eight months ended February, 1922, the company realized revenue from passengers amounting to $7,412,175, against $6,345,330 for the same period a year ago. The net corporate income for this period amounted to $980,838, against a deficit for the eight months ended February, 1921, of $908,994.

$50,000 More Approved.—An additional $50,000 for the city's expenses in the valuation proceedings of the Philadelphia (Pa.) Rapid Transit Company before the Public Service Commission was recently approved by the finance committee of the City Council. An appropriation of $175,000 has already been approved for the employment of experts. The work of fixing a value on the Philadelphia Rapid Transit properties is for the purpose of determining the permanent rate of fare the company should charge. Chairmen Gaffney recently explained how the appropriations had so far been spent.

New United Light Issue Offered.—A new issue of $7,000,000 United Light & Railways Company, Grand Rapids, Mich., first lien and consolidated mortgage 6 per cent gold bonds, Series A, is being offered by Bonbright & Company, Inc., New York, N. Y. The bonds are dated April 1, 1922, and are due April 1, 1952, and are non-callable for twenty-five years. They are offered at 93¾ and accrued interest, to yield more than 6.45 per cent. The company operates properties furnishing diversified public utility service in seventy-seven communities in the Middle West, most of them in Iowa and Illinois.

Service Will Be Resumed.—Railway service will be resumed in Corpus Christi, Tex., by the Nueces Railway. Street car service in Corpus Christi has been suspended since the power plant was destroyed by fire in October, 1921. A new power plant has been built, and the three-phase equipment was cut in last week. During the time the cars were not in operation, transportation was afforded by motor buses operated by the trainmen of the traction company. When the new service is inaugurated a 5-cent fare will be charged, and a twelve-minute schedule will be maintained on the company's lines.

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Traffic and Transportation

New Fare Expected

Commission Takes Under Consideration Chicago's Preferential 5-Cent Rate —Adjournment Until April 26

An order for a new rate of fare on the Chicago Surface Lines is expected in the near future. The 8-cent fare still continues under federal court injunction, and the Illinois Commerce Commission took under advisement on March 31 the city's application for an experimental rate, preferably 5 cents. The last hearing before the commission was marked by a formal notice from the employees' union that a cut in wages would mean a strike. The Chicago company is now paying a maximum wage of 80 cents an hour for platform men and the union representatives resented the suggestion of the commission and the city that they should do something to help reduce the cost of transportation.

The union statement was presented in written form at the conclusion of evidence. The men asserted that the cost of living in Chicago has not fallen so as to justify a reduction in wages, which, they claim, are for the first time on a basis parallel with living costs. They presented figures to show that rents, fuel and taxes are higher than the government data indicate. In speaking on behalf of 14,000 employees and their families they protested against "that which seems to them an attempt to force these workers and their families back into the condition of want and privation they experienced so many years." They also made a strong defense of present working conditions provided by their agreement with the company, claiming that the city's contentions for a longer work day and more swing runs would be a hardship and would reduce the number of runs so as to deprive thousands of employees of their jobs. They refused to bear the burden of any economies which the companies might be ordered to make.

After the city's attorney had talked for several hours in the closing arguments, the company's lawyer said he would rest his case on the showing made in the federal court that evidence had not been presented to justify a reduction of the 8-cent fare. Counsel for the city stated that he was not asking the commission to fix wages or salaries, but said it could order a rate of fare which would force the company to economize. He suggested that further payments into the renewal and damage funds be prohibited and that the commission might even consider the city's 55 per cent of net receipts as profits because the city will not accept this money.

Chairman Smith of the commission made a statement in which he denied any prejudice or political bias on the part of that body and regretted that the law did not empower him to demand an explanation of those who have circulated such charges. It has been rumored that the commissioners were agreed on an order for a 6-cent fare and 1-cent transfer charge, to be made effective before primary day, April 11. An adjournment was taken until April 26, when evidence will be resumed in the main case, this proceeding having been based on a demand for a temporary trial of a lower fare.

Petition for Ten-Cent Fare

A committee of business men recently conferred with officials of the Wheeling (W. Va.) Traction Company and urged that a straight 10-cent fare be established from Wheeling to Bridgeport, Martins Ferry and Bellaire, all Ohio towns, and that other fares be cut to not more than 60 per cent above those of 1914. H. C. Ogden, spokesman for the business men, said the company's franchises provide for a 5-cent fare, including transfers, and that these still constitute a contract, although every one agreed that during the war a higher fare was needed. The burden of proof was now on the company.

W. B. Wills, general manager of the Wheeling Traction Company, said the company was operating at a loss. The average seating capacity of a car, he said, was fifty-seven and the average load only twenty. He said the buses operating between Wheeling and the Ohio cities were taking $10,000 a month from railway revenues. Company officials told the committee they would notify it before July 1 if a fare reduction were practicable.

One-Man Cars Can Be Operated Safely

When the Illinois Commerce Commission authorized the use of one-man cars in Illinois by the Tri-City Railway it referred to the common objection that certain serious accidents have happened in the operation of one-man cars. Yet the commission indicates that there is nothing in the record to show that these particular accidents are due solely to the use of one-man cars.

According to the commission, statistics in the record showed that fewer accidents have happened by the operation of one-man cars than as a result of cars operated by two men, step accidents especially being reduced to a minimum due to one man being in full charge of the car in starting and stopping, obviously eliminating the divided responsibility under the two-men operation. In its statement the commission said that the safe operation of this type of car requires the motorman never to reverse or back them and further that the car should never be operated except from the controller in the end facing the direction toward which it is moving.

Hollywood Rehearing Held

Commission's Engineer Declares Impossible the Plan of Operating Hollywood Line Separately

The rehearing granted by the California Railroad Commission to communities who protested the recent rate increases on the lines of the Pacific Electric Railway was held on March 20, 21, 22 and 23. The commission's decision of Dec. 24, 1921, granted the Pacific Electric an increase on a mileage basis in interurban fares, which were put into effect on Jan. 1, 1922, and an increase of local passenger fares on its nine local lines in Los Angeles, whereby the commission established a zone system for a 6-cent fare for traveling in each of the two zones, inner and outer and a 10-cent fare for traveling from one zone to another with transfer privileges. Details of the fare order were given in the ELECTRIC RAILWAY JOURNAL, issues of Jan. 7 and Jan. 14.

The strongest protest came from the Hollywood Board of Trade, and following the protestants' request the hearing was held in the Masonic Auditorium in Hollywood. It developed at the first day of the rehearing that due to amended petitions filed by the Hollywood contestants, the main issue involved the subject of the extensions to Hollywood of the lines of the Los Angeles Railway rather than the anticipated protest. The Los Angeles Railway angle of the case was disposed of when the commission ordered interested parties to the controversy to submit briefs of arguments within a period of twenty-five days. Ten days additional in which to answer the briefs were also provided for in the governing body's stipulation.

COMMISSION'S JURISDICTION DISCUSSED

At the opening of the rehearing held en banc before the Railroad Commission, President Harley W. Brundige of the commission brought up the point of the jurisdiction of the commission over public utilities and asked for citations upon the point of this overlapping jurisdiction that would make clear whether the power to order extensions of paralleling lines into the territory already occupied by a public utility is vested in the Board of Public Utilities of Los Angeles or in the Railroad Commission.

The Hollywood Board of Trade attorney said that the authority of the commission was paramount in the instance under discussion. The Los Angeles city attorney claimed that the line between the jurisdiction of the city and the commission was not clearly drawn. The opposite side of the argument was taken by E. O. Edgerton, former head of the railroad commission, and at present acting as special counsel for the Los Angeles Railway. Mr. Edgerton stated that the city's present class of twenty-one year franchise makes the financing of such lines an impossibility. The Hollywood Board of Trade is trying to force some authority to extend five different lines of the Los Angeles Railway into Hollywood territory now exclusively served by the Pacific Elec-

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tric, The Los Angeles Railway still operates a 5-cent fare in Los Angeles.

It was declared by the Los Angeles Railway counsel that the lines demanded extended had only 4, 5, 9 and 19 years yet to run on their existing franchises, and that the class of franchise now obtainable in the City of Los Angeles was not an asset as the old 40 and 50 year type of franchise granted in the early days; but the newer type was a liability. It was opinioned that any order of any governing body to extend these lines would be confiscatory and force the Los Angeles Railway to apply for higher rates on its entire city lines if it was forced to extend its 5-cent lines into Pacific Electric 10-cent Hollywod territory to satisfy Hollywood's clamor for a 5-cent fare regardless of the haul of over 8 miles involved.

Paul J. Ost, Assistant City Engineer of San Francisco Municipal Street Car Lines, and employed by the Hollywood Board of Trade to show that the Railroad Commission's basis on which the Pacific Electric was granted an increase of rates was unsound met with considerable opposition. He claimed under testimony that his calculations were based on data supplied by the commission's engineers in their service survey and valuation report of the Pacific Electric Railway's property; but it appeared that Mr. Ost got hold of some wrong figures in the report, as Mr. Richard Sachse, Chief Engineer of the Commission, stated that the figures used by Mr. Ost were taken from an incomplete report of the state engineers compiled in June, 1921.

Suggests Independent Operation

Mr. Ost attempted to set the Hollywood lines out as a separate entity—to be operated independent of the other nine local city lines of the company. The commission's chief engineer explained that this was impossible. It was also cited that the State Constitution and Public Utilities Act prohibits the commission from discriminating against persons and places. It was shown that the earnings of the Hollywood Lines in January and February of this year installing the higher fares showed an increase of approximately $30,000 over the same months of 1920.

The zone alteration asked for in the amended protest filed with the commission was withdrawn by the Hollywood attorney restoring the zone to original bounds, as Engineer Ost for Hollywood recommended the inner zone be expanded.

Mr. Sachse of the Commission is defending his reports and recommendations to the commission, as attacked by Mr. Ost, claimed Mr. Ost's methods of rate-making theory were wrong and would not apply in the Hollywood case. Mr. Ost opinioned himself as opposed to a zoning system, being favorable to the straight fare as applies on the San Francisco municipal lines. He stated that the main point in which his report departed from the data furnished him by the commission's engineers was in estimated operating expenses of the Hollywood Lines. The maintenance charged these lines he insisted would bear trimming. His methodical theory of a reasonable rate on the Hollywood Lines was that the present 10-cent fare from the outer zone in Hollywood into the inner zone or vice versa should be 8 cents—a haul of over 8 miles.

During the first two days of the rehearing the Hollywood interests were concluded, and the last two days, as held in the commission's court rooms in Los Angeles, were devoted to rehearing other communities of Southern California served by the Pacific Electric local and interurban lines, who were petitioning the commission for a further readjustment of the rates.

Bus Lines Under Consideration

Attorneys for Alhambra, South Pasadena and Glendale communities leading in the petition for readjustment of the rates had municipal bus lines under consideration, so they informed the commission, but Mr. Sachse gave it as his opinion that very careful investigation should be made before any effort was made to start bus lines to compete with the Pacific Electric. Other suburbs of Los Angeles also filed petitions.

The attorneys from outlying interurban ciites did not offer further protest to the valuation figures of the Commission on which a fair return was estimated, as they had previously protested against the valuation figures including a fair return on donated rights of way and bonuses, claiming their rates should be lower on lines operated over such free rights of way and under such conditions.

These communities' attorneys testified it was a judicial point observed in rate-making throughout the United States and the law governed in this respect. The chief counsel of the Pacific Electric filed a brief with the commission outlining the Company's position and attitude in the matter and citing many and certain Supreme Court rulings in this particular instance.

It will probably be forty days before the commission can conclude a decision in this rehearing.

The Los Angeles Railway Corporation's application for a rehearing for a straight 6-cent fare on its lines without taking the token privilege, as formerly authorized by the commission, was scheduled for rehearing at this time. The Los Angeles Railway had rejected the commission's granting of an increase from 5 to 6-cent fare with token privileges and requested a rehearing for purpose of eliminating the token feature and obtain, if possible, permission for a straight 6-cent fare.

While the Hollywood-Pacific Electric case was under way the Los Angeles Railway requested permission of the commission to withdraw its petition for a rehearing, which was granted and the application wiped off the board. This means that the Los Angeles Railway will still continue operating under the 5-cent fare in Los Angeles.

Committee Claims Exoneration From Charges of Bad Faith

An adjustment committee from the Dallas (Tex.) Railway has filed a statement outlining the position of the railway in the present fare controversy. This committee claims that the railway operated at a loss from Dec. 1, 1920, until May 1, 1921, on which date the City Commission granted authority to increase fares from 5 cents to 6 cents. Further that statements showing the company's loss on file with the Supervisor of Public Utilities exonerates the committee which negotiated with the city as well as the executives and members of the railway's Board of Directors from charges of bad faith made by city officials.

The controversy arose when the city officials learned that $100,000 collected by the traction company since the 6-cent fare went into effect over and above the authorized return of 8 per cent on its invested capital had been paid out to stockholders of the company in dividends. It was claimed that the agreement between the city and the traction company at the time the 6-cent fare was granted, was that additional earnings under the 6-cent fare would be used to make certain improvements, notably paving between the tracks on certain streets ordered paved by the city, and that in not using the earnings as agreed the company had acted in bad faith. The city, when it was learned that revenues under the 6-cent fare had been paid out in dividends, on the ground that back dividends guaranteed by the city were being paid, issued notice of hearing on April 6 on a proposal to reduce fares in Dallas from 6 cents to 5 cents and officials of the company were directed to appear before the commission and show cause why such reduction should not be made immediately.

A detailed statement from the committee outlining the company's position was submitted to the Mayor and Board of City Commissioners. This controversy in Dallas was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 18.

Increased Fares in Effect

The Public Utilities Commission of the state of Idaho on Feb. 25 handed down its decision in answer to applications of the Boise Valley Traction Company and the Boise Street Car Company for increased fares on city lines. This order authorizes the following schedule for the Boise Street Car Company's city lines and the Tenth and Eighteenth Streets Belt Line of the Boise Valley Traction Company:

Cash fare	7 cents
Ten tickets	50 cents
Forty school tickets	$1.00

The South Boise line operated by the Boise Valley Traction Company was excepted from the order and a cash fare of 5 cents authorized, with forty school tickets for $1. The new fares became effective on March 6.

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Meeting Held in Waterbury on Fare Experiment

A proposal that the Connecticut Company be ordered to reduce the fares in Hartford, Conn., to 5 cents, with an additional charge of 2 cents for transfers, was laid before the Public Utilities Commission recently by Alderman Charles Schmidt of Waterbury during a hearing in Waterbury. It was proposed as a part of a suggested experiment for trial in the four largest cities, and after the experimental period the company would be asked to adopt for all the large cities the plan which has proved most successful in the tests. Alderman Schmidt's plan was to have Bridgeport continue with its present radial rate of 5 cents with no transfers, while New Haven would try a straight 7-cent fare, Waterbury a 5-cent fare with transfer privileges, and Hartford the plan mentioned above.

Two of the three members of the Public Utilities Commission who were present at the hearing announced that the commission would give consideration to the plan and announce its decision later.

A citizens' hearing on the matter of a 5-cent fare on the Connecticut Company's lines was largely attended at New Haven, Conn., recently. President Storrs of the company was not present, having been called to Denver by reason of illness of a relative, and the company was represented by Manager Harlan. Mr. Elwell presided for the Public Utilities Commission, as Chairman Higgins is ill. The petition was twofold—a nickel fare and a re-routing of local lines to give positive rather than indirect service on all lines. There were many speakers in behalf of the fare, some asking for the 5-cent unit and showing a willingness to have a transfer made an extra charge, while others wanted action which would end the plan of having transfer points at busy places on the central streets.

Jitney Regulatory Ordinance Invalid

The city ordinance passed by the City Commission of San Antonio, Tex., several weeks ago regulating the operation of jitneys inside the city limits, has been held invalid and an injunction restraining the city authorities from enforcing its provisions has been granted by Judge R. B. Minor of San Antonio. The ordinance was passed by the city in carrying out its part of the agreement with the Public Service Company, which owns and operates the electric railway system in that city, under which fares were reduced to 5 cents on condition that the city stop the operation of jitneys within the city except those operating to Camp Travis, which is not served by a car line. Since the ordinance was held invalid and its enforcement enjoined, jitneys have run riot, taking any route desired and maintaining any schedule or no schedule at all.

In his opinion Judge Minor said that if the controlling purpose of the commissioners in passing these ordinances was to destroy the jitney business and create a monopoly in the San Antonio Public Service Company then two conclusions must follow: First, that the ordinances were not passed for the bona fide purpose of relieving congestion in the interest of public safety, and, second, the ordinance would be void as having the deliberate purpose to create a practical monopoly.

Transportation News Notes

Hearings Ended. — Hearings before the Nebraska State Railway Commission on the application of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for a permanent rate of fare have been concluded. The finding will probably not be handed down before July 1.

Better Relations Sought. — *Trolley Wires* is a new publication in the interest of the employees of the South Covington & Cincinnati Street Railway, Covington, Ky. It made its appearance on March 30. The object of the publication is to seek a better understanding among railway officials, patrons and employees.

Will Experiment with Lower Fare.— If the State Public Service Commission gives its consent, the Grays Harbor Railway & Light Company, operating in Aberdeen and Hoquiam, Wash., will experiment with a 5-cent fare in the two cities, with a 10-cent fare for intercity travel or to Cosmopolis. The present fare is 10 cents in both cities, with the same fare for intercity travel.

Reduced Fare on Toledo Beach Line. —A reduction in fares on the Toledo, Ottawa Beach & Northern Railroad, Toledo, Ohio, has been announced to take effect April 1. The round-trip tickets from the Casino to Toledo Beach for adults will be 30 cents. Children over 5 and under 12 years of age will be charged 15 cents. Forty-five commutation books good for thirty days will cost $4.80. The former price was $5.75.

I. C. C. Decision Expected April 15.— The decision of the Interstate Commerce Commission in the matter of a general reduction in rates, it now appears, will not be forthcoming before April 15. At present the case is being studied by the commissioners individually. If they should find themselves in substantial accord, the decision probably could be handed down as early as April 15, but should there be important differences among them, it obviously will extend the time required for the consideration of the case.

One-Man Car Operation Started.— Operation of the new one-man cars on certain of the lines of the Dayton (Ohio) Street Railway was started April 2. At the invitation of W. L. Smith, general manager of the company, a number of city officials and members of the City Commission, together with Mayor Hale and City Manager Eichelberger made a test trip the preceding week and expressed themselves highly satisfied with the operation of the cars. The city officials were accompanied on the trip by W. A. Keyes, president of the road, and general manager Smith.

Rerouting Ordinance Passed.—Ordinances calling for the rerouting of all downtown lines of the Cincinnati Traction Company were passed by the City Council by a vote of twenty-seven to five, despite the fact that several business organizations voiced strenuous objections to the plan. The principal argument against the rerouting plan is that it is based upon an elaborate scheme of one-way streets in the downtown section. W. Jerome Kuertz, Director of Street Railways, proposes to reroute nearly all downtown lines over seven different loops.

Increased Fares Resought.—The Galveston (Tex.) Electric Company has renewed its efforts to get an increased fare in Galveston, and at the meeting of the City Commission recently a petition from the traction company was presented setting forth that the company can not meet operating costs under its present fare. The petition was referred by the commission to the city attorney for investigation as to the propriety of considering the petition while the suit of the city of Galveston against the Galveston Electric Company, enjoining the company from increasing its fares, is pending in Federal Court.

Fifteen Tokens for One Dollar. — The Public Utilities Commission of the District of Columbia has authorized the Washington (D. C.) Railway & Electric Company to sell fifteen tokens for $1. The Capital Traction company has been selling at this rate without express authority from the commission. The established fare is 8 cents cash or six tokens for 40 cents, and to save time in purchases the Capital Traction Company advertised fifteen for a dollar, which will now be followed by the Washington Railway & Electric Company.

Fares Adjusted.—Fares on the lines of the City Light & Traction Company, Sedalia, Mo., have been finally fixed by a recent ruling of the Missouri Public Service Commission. Numerous hearings and some changes in previous orders have resulted in a 10-cent cash fare with a ticket rate of ten tickets for 6 cents each and children's tickets for 3 cents each. The property is valued by the commission at $300,000 and the earnings under the new finding are stated to be about 3 per cent with a 3 per cent allowance for depreciation. In the Feb. 18 issue of the ELECTRIC RAILWAY JOURNAL reference was made to the 8-cent cash fare order of the commission.

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New Publications

Government Control and Operation of Industry in Great Britain and United States During the World War

By Charles Whiting Baker. Published by the Carnegie Endowment for International Peace, New York. 138 pages.

The tremendous output of the industries in the United States and Great Britain was one of the striking features of the war. The fate of Great Britain and the world, according to Mr. Baker, never hung on a more slender thread than during the early months of 1914, when the question was undecided whether British labor would sacrifice its dearly purchased power over wages, hours of labor, working conditions and output. But Lloyd George accomplished the feat of persuading labor to make this sacrifice, and had he performed no other service he would have deserved perpetual honor as the savior of his country and the world. The industrial record in this country for the five years was a revelation of the world's surplus production capacity, but such stimulation necessarily has to be followed by a period of depression. Mr. Baker's book covers quite thoroughly the action of the government in this country in the case of the railways, public utilities, shipping, labor, fuel, etc., as well as what was done in Great Britain. On the whole, Mr. Baker's answer to the question "How has government operation worked?" during the war must be considered favorable, and he sees in the future an extension of government control over certain industries, in cases where private ownership breaks down.

Principles of Alternating Currents

By Ralph R. Lawrence, associate professor of electrical engineering, Massachusetts Institute of Technology. Published by McGraw-Hill Book Company, New York, N. Y. 432 + xiv pages, illustrated.

This text-book covers the fundamentals of electric circuits in a way which will prove clear and interesting to readers having a thorough preparation in physics and in mathematics through the calculus and the elements of differential equations. Its place is thus the classroom of the high-grade engineering school, or the reference library of the trained engineer who wishes to "brush up" on theory from time to time.

The Electrification of Railways

By H. S. Trewman. Published by Sir Isaac Pitman & Sons, New York, 1920. Cloth 4 x 7 in., 78 pages.

To date there has been but little published on railway electrification for the benefit of the layman. It is the author's intention in this book, without going into detail, to bring to the reader's notice some of the main questions to which attention must be paid, giving at the same time sufficient technical electrical information to enable these points to be understood. The occasion for the book is the wide discussion that has taken place in England for several years past of the electrification of steam railways. The importance of the subject has steadily increased, especially during recent years, and the author states that there is an urgent need for a more general appreciation of the possibilities of electric traction.

Städtebau ("City Planning")

By Otto Blum, G. Schimpf and W. Schmidt. 478 pages with 482 illustrations, published by Julius Springer, Berlin.

This is one volume of a library of twenty-two engineering books being issued by the publishers under the direction of Robert Otzen. It is divided into three parts, each written by one of the authors mentioned. The first takes up city planning in general, the second transportation in cities and the third paving. It is the second section, comprising 274 pages, or more than half of the book, in which readers of this paper will be most interested.

This chapter is a posthumous work of the author, Prof. Schimpf of Aachen, who died shortly after he had practically completed the manuscript. He had studied American transportation systems in this country and his portion of the book embodies data from all countries. In the first chapter the author takes up the question of traffic distribution, hourly, daily and monthly, in different cities in Europe and America, with load curves and charts, showing lengths of ride in certain cities, with a theoretical division of travel between street cars, rapid transit lines and walkers, based on distance covered. In a second chapter he considers the relations, determined from records, between population, mileage of track, speed and number of passengers; then the subject of ideal and actual layouts for radial and longitudinal cities. The following chapter is devoted to rapid transit station layouts, actual and ideal; another to different types of elevated and subway structures, carhouses and repair shop layouts. The fifth section of the book is given up to equipment and contains designs of different types of rapid transit cars, showing seat arrangement, etc., with a table giving dimensions and weights of cars, total and per seat and per passenger, with other details. In the chapter on operation graphic time tables are given of the Hamburg Städtebahn and Elevated Railway, lengths of station stop on the Berlin Elevated Railway, according to the number of passenger interchanges, and whether the train consists of one, two, four or six cars, etc. There is almost an equally extended treatment of traffic, line layouts, waiting stations, track construction, overhead construction, car equipment, fares, etc., for surface lines. The concluding chapters in this section relate to bus and ferry operation.

Legal Notes

NEW YORK—*Damages from Operation of Elevated Railway.*

Where an owner of premises owns land to the center of the street, subject to the public easement, it is proper for the court to consider this fact in fixing the damage from the maintenance and operation of an elevated railway in the street. [Berry vs. City of N. Y., N. Y. Supp., 631.]

NEW YORK—*Removal of Subway Kiosks at Company's Expense Not Compelled.*

Where a traction company located its subway kiosks on the sidewalks under a certificate issued by the board of rapid transit commissioners with the consent of the city, the company could not be compelled to bear the cost of removing the kiosks when the roadway was subsequently widened. [City of New York vs. Hudson & Manhattan R.R., Northeastern Rep., 152.]

NEW YORK—*Receipts from Advertising Are Receipts from Operation.*

The section of the Transportation Corporation's Law under which certain routes of the Fifth Avenue Coach Company operated provided that such a corporation " . . . shall also pay to the comptroller or other fiscal officer of said city 5 per centum of its gross receipts from the operation of said routes." The question involved, which was decided in the affirmative, was whether the revenue derived from advertisements in the interior of stages constituted part of the "gross receipts from the operation of said routes." [City of New York vs. Fifth Avenue Coach Company, 127 Northeastern Rep., 910.]

NEW YORK—*Passenger, Who Passed Behind Car After Alighting Therefrom and Was Struck by Another Car, Held Contributorily Negligent.*

A passenger, who, after alighting from a car, passed behind it and was struck by a car approaching on other track from opposite direction, though she did not actually step on the other track, was held to be contributorily negligent. [Wall vs. International Railway, 188 New York Supp., 550.]

PENNSYLVANIA—*A Passenger Struck While on the Step by a Passing Car Was Guilty of Contributory Negligence.*

A boy 18 years of age, boarding a crowded street car which he could not enter and standing on a step where he knew that there was only 6 in. clearance between the car and any other car that would pass on the next track, was guilty of contributory negligence. [112 Atlantic Rep., 22.]

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Personal Mention

H. S. Day Leaves Kansas City Railways

Henry S. Day, equipment engineer of the Kansas City (Mo.) Railways, has resigned to become vice-president, in charge of production, of Smith & Sons Manufacturing Company, Kansas City, manufacturers of road building machinery. His resignation became effective April 1. R. W. Bailey, superintendent of power, has been made superintendent of power and equipment and assumes the added responsibility of the mechanical department. R. S. Neal, heretofore in charge of the drafting room and engineering work in the mechanical department, has been appointed assistant superintendent of equipment.

Mr. Day took up his work with the Kansas City Railways on July 1, 1919, immediately after his return from France, where he served as a Captain of the 37th Engineers. Prior to the war he was a valuation engineer for Sanderson & Porter and before that was for seven years on the New Haven Railroad in a responsible position in connection with the maintenance of the equipment on the electrical division. His early training was gained with the Westinghouse Electric & Manufacturing Company.

Upon severing connection with the Kansas City Railways, his fellow employees at the shop presented him with a fine Hamilton watch and an alligator traveling bag, and Mrs. Day with a forty-eight piece silver service.

C. W. Preble, superintendent of interurban lines of the Ohio Electric Railway, Springfield, Ohio, has taken a similar position with the Cincinnati & Dayton Traction Company, Dayton.

W. G. Neibert, who for several years has been the auditor for the Monongahela Power & Railway Company, with headquarters at Fairmont, W. Va., has been transferred to Parkersburg and will be the auditor for the Parkersburg-Marietta division of the traction company.

M. J. Collins, for twenty-eight years in the service of the Ohio Electric Railway, at Hamilton, Ohio, has been named superintendent and claim agent for the Hamilton district, succeeding Gordon Lewis, to whom he was formerly assistant. Mr. Lewis has severed his connections with the railway.

George H. Hudson has just been appointed master mechanic of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga. Mr. Hudson was master mechanic of the Tampa Electric Company from 1910 to 1918. In the latter year he resigned to become superintendent of equipment of the Monongahela Traction Company, Fairmount, W. Va. He resigned from that company because of illness and later joined the forces of the Ohmer Fare Register Company which he held until he took up his new work.

Joins Transit Commission

E. A. Roberts of the Beeler Organization Appointed Chief of Transit Bureau

Chief of the Transit Bureau of the New York Transit Commission! This is the title, with its attendant duties and responsibilities as well as honors, bestowed upon Edward A. Roberts on March 23. Mr. Frank Bennett has been named his assistant.

Mr. Roberts takes up his work with no small previous training and experience. He has been assistant to John A. Beeler, consulting traffic expert, and

E. A. ROBERTS

during his connection with Mr. Beeler has done intensive work in the supervising of electric railway operations. His new work will be of prime importance to the Transit Commission, for the expert advice and suggestions which he qualified to offer will increase the value of the regulatory work of the commission.

For some time at least Mr. Roberts' duties will be to work out plans for the efficient utilization of the transportation facilities already in existence. The commission considers that this is the greatest immediate work until new subways can be completed—a matter of perhaps five years.

Mr. Roberts has a long list of accomplishments already to his credit. Since joining Mr. Beeler's organization in 1917 Mr. Roberts has served with the Massachusetts Public Service Commission in the investigation of operating methods and practices preceding state control of the Boston Elevated Railway, and with the Public Utilities Commission of the District of Columbia. His work there was to increase the capacity of the Washington railway systems under war conditions. He has also made extensive investigations for the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey.

Among his many duties Mr. Roberts has found time to write several illuminating articles for the ELECTRIC RAILWAY JOURNAL.

After his graduation from Harvard College in 1914 Mr. Roberts spent two years with the General Electric Company at Lynn, Mass., and Erie, Pa., in departments connected with the manufacture of electric railway apparatus. During 1916-17 he was a research member of the faculty of the railway engineering department of the University of Illinois, and for a short time thereafter he was associated with the Boston Elevated Railway in its electrical engineering department.

Elbert G. Allen has recently become connected with the Philadelphia (Pa.) Rapid Transit Company's engineering forces. He was formerly advisory engineer with Stone & Webster. Mr. Allen was graduated from the Massachusetts Institute of Technology. He received the degree of B. S. in mechanical engineering in 1900 and E.E. in 1901. He immediately entered the service of Stone & Webster.

William J. Baldwin, assistant to General Manager Kempster of the New Orleans Railway & Light Company, New Orleans, La., in the capacity of publicity director, has resigned to accept the position of assistant to the president of the Alabama Power Company, Birmingham, Ala. Mr. Baldwin's work at New Orleans has attracted unusual attention both for its originality and its forcefulness.

Walter E. Bryan, superintendent of power of the United Railways, St. Louis, Mo., was recently elected president of the Engineers' Club of St. Louis, and president also of the Joint Council of the Associated Engineering Societies of St. Louis. For some time he has served as chairman of the electrolysis committee of the American Electric Railway Association. Mr. Bryan is a graduate of Washington University, and, with the exception of eight months, has served the United Railways in various technical positions continuously since his graduation.

Edwin Gruhl, vice-president and general manager of the North American Company, New York, N. Y., has been elected president of the North American Edison Company, a newly organized subsidiary of the North American Company. The new company was incorporated on March 25 in Delaware. It will own 72.7 per cent of the outstanding common stock of the Cleveland Electrical Illuminating Company and the entire outstanding common stock of the Union Electric Light & Power Company, St. Louis, Mo. The 200,000 shares of no par value stock of the North American Edison Company will all be owned by the North American Company.

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Mr. Gadsden Chairman of Committee Reporting on Trade Associations

Philip H. Gadsden, Philadelphia, former president of the American Electric Railway Association, has been appointed chairman of a committee of the Chamber of Commerce of the United States which meets in Washington on April 5 to report on the manner in which trade associations may render the greatest service to business and the public.

George W. Booz has been appointed supervisor of traffic of the Camden lines of the Public Service Railway, Camden, N. J. Mr. Booz was formerly day station master. Jake Adams now holds this position.

Thomas K. Glenn, president of the Georgia Railway & Electric Company, Atlanta, Ga., has been elected president of the Trust Company of Georgia. He plans to give up his work as president of the Atlantic Steel Company.

J. L. Egolf, general superintendent of the Interurban Railway & Terminal Company, Cincinnati, Ohio, has accepted a position as general manager of the Aurora, Elgin & Chicago Railway, Fox River Division, with headquarters at Chicago, Ill.

John Paul Lucas, editor of the *Southern Public Utilities Magazine,* will direct the state "Live-at-Home" campaign in North Carolina. He was appointed by Governor Morrison. Mr. Lucas' work will be to issue information concerning agricultural conditions in the state and to urge the farmers to raise food stuffs so that they may be economically independent.

E. J. Burns, formerly efficiency expert of the San Diego (Cal.) Electric Railway, who is largely responsible for the zone system of fare collection now in successful use there, has been appointed assistant general manager of the company. The appointment of Mr. Burns to the newly created position was one of the first acts of the company's new general manager, Claus Spreckels.

George E. Snider, who has been chief engineer of the Toledo Edison Company, has been promoted to chief engineer of the Ohio Public Service Company, with headquarters in Cleveland. The new position puts him at the head of the production department of the Henry L. Doherty properties at Elyria, Lorain, Warren, Alliance, Massillon, Orrville and Mansfield. J. F. O'Connor, who has had charge of the Acme plant at Toledo, will succeed Mr. Snider. A. L. Rider will take Mr. O'Connor's place.

F. M. Finlayson, superintendent of power of the Worcester (Mass.) Consolidated Street Railway, has been made superintendent of lines also. He has been with this company since 1906, first as chief engineer of the Fremont Street plant. He had previously served the company from 1902 until 1904 as engineer at this station. Prior to the time he was engineer of power stations for the Newton & Boston Street Railway. During his absence from the Worcester company he was engineer of the power plant of the Pittsburgh, McKeesport & Connellsville Street Railway, Pittsburgh, Pa.

Obituary

Leo Daft

Leo Daft died at Albany, N. Y., on March 29. To many persons engaged in the electric railway industry today Mr. Daft's name is merely a memory, so rapidly is history made, but it was he and his contemporaries, Sprague, Van Depoele, Short, Bentley, Knight and others who, in the pioneer days of electric railroading, laid the foundations on

LEO DAFT

which the industry now rests. To record all the work done by Mr. Daft in the early days would require a volume in itself so firmly was what he did linked with the important developments of the times. These developments Mr. Daft sketched himself in an article over his own name published in the STREET RAILWAY JOURNAL for Oct. 8, 1904, on the occasion of the twentieth anniversary of the founding of the paper. This article, six pages in length, reviewed the work done under Mr. Daft's own supervision for the Daft Electric Company in Pittsburgh, Baltimore, Saratoga, Coney Island and on the Manhattan Elevated Railway in New York in 1882 and shortly thereafter. Mr. Daft's active connection with the electric railway industry ceased about 1895. He then traveled extensively at home and abroad until about 1901, when he settled in Rutherford, N. J., and commenced work on a process whereby rubber is vulcanized onto metal plated with alloy. It was along this and allied lines that Mr. Daft had worked recently except for such interruptions as occurred when he was acting as a consultant or as an expert. Mr. Daft was born in Birmingham, England, on Nov. 13, 1843. He was a charter member of the American Institute of Electrical Engineers, a member of the International Conference of Electricians in 1904, a member of the American Association for the Advancement of Science and a member of the Electro-Chemical Society.

Michael J. Clark, for twenty years with the Associated Bureaus of the Pittsburgh Railways, died in that city on March 17.

George F. Allen, for many years a salesman with the Railway Materials Company, Chicago, and widely known and esteemed among steam and electric railway men of the Middle West, died March 24.

W. T. Pilcher, foreman in the Building Department of the United Railways, St. Louis, Mo., was shot by an unknown assailant on Feb. 6, and died Feb. 11. Mr. Pilcher had been with the company nineteen years.

Fred C. Hinds, long identified with the construction of electric railways, died March 12, at his home in West Newton, Mass. He was born in Calais, Me., sixty-eight years ago. He was one of the builders of the Boston & Worcester Street Railway, and he also was interested in the construction of the Bay State Street Railway and other lines in Massachusetts.

Otis H. Cutler, former president of the American Brake Shoe & Foundry Company, died recently aboard the yacht "Seramia" off the Florida coast. At the time of his death Mr. Cutler was chairman of the board of directors of the company. His connection with the company dates back to 1902 when he became affiliated with it as vice-president and general manager. His term as president extended from 1903 to 1916. Previous to his connection with the American Brake Shoe & Foundry Company, Mr. Cutler was manager of the Ramapo Foundry Company. From 1895 to 1898 he served in the New York State Assembly and during the European war was manager of the insular and foreign division of the American Red Cross.

Henry P. Nawn, president of the Hugh Nawn Construction Company, Boston, Mass., died March 28 at Gilboa, N. Y. He was sixty-four years old. Mr. Nawn was associated with many large construction undertakings in New England. His work in and near Boston included the construction of the East Boston tunnel, the Washington Street tunnel, the Boylston Street subway and station, the Cambridge tunnel and stations, two sections of the Dorchester tunnel and stations, the tunnel stations at the junction of Washington and Summer Streets, the L Street tunnels of the Edison Electric Light Company, the foundations of the Elevated structure at Sullivan Square, and the concrete structure of the Boston Elevated Railway at Forest Hills. He organized the Hugh Nawn Contracting Company in 1905. Mr. Nawn was engaged on a construction job at Gilboa at the time of his death.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

American Gear Manufacturers to Meet in Buffalo

The sixth annual meeting of the American Gear Manufacturers' Association will be held April 20, 21 and 22 at the Lafayette Hotel, Buffalo, N. Y.

This association, through a sectional committee, has been giving close co-operation to the American Engineering Standards Committee, and the report of this and other committees on standardization promises to be of unusual interest.

Special emphasis will be given to business conditions in the gear industry and the outlook for the immediate future.

Among the subjects to be discussed are "Good Hob Practice," by H. E. Harris of the H. E. Harris Engineering Company; "The Use of the Projector Comparator in Testing Gear Teeth," by Ralph E. Flanders of the Jones & Lamson Machine Company; "Proportions of Industrial Gears," by G. E. Katzenmeyer of the R. D. Nuttall Company; "The Grinding of Gear Teeth and Its Future in the Industry," by R. S. Drummond of the Gear Grinding Machine Company; "The Gleason Works System of Bevel Gears," by F. E. McMullen and T. M. Durkan of the Gleason Works, and "Conditions in the Industry," discussed from the standpoint of the industrial member companies under the leadership of George L. Markland, Jr., of the Philadelphia Gear Works and from the automotive standpoint with R. P. Johnson of the Warner Gear Company presiding.

An informal banquet for representatives and guests will be held on Friday evening, April 21, the principal speaker at which will be John C. Bradley of the Pratt & Letchworth Company, Buffalo, N. Y., who will take as his subject "What's Ahead."

New Cars Received in London

The London County Council has begun to receive delivery of 125 new tramcars, which have been on order for a considerable length of time. On Jan. 27 a demonstration trial run was given with one of these cars. In general appearance they are quite similar to the cars now in use, being double truck, double deck, with top deck covered, and having a total seating capacity of seventy-eight passengers. There are some changes in the equipment, however. The new cars have two motors of 60 hp. each, as compared with 42 hp. used with the older cars. These latter when hauling trailers are not able to accelerate as rapidly as is desired. The new cars will be able to accelerate with a trailer at a rate of 1.37 m.p.h. per second, which is the rate of the older cars without trailers. By using the new cars in trailer service as far as possible, the average speed on any route will be increased. When running without a trailer the new cars can accelerate at a rate of 2.06 m.p.h. per second, up to a speed of 12 miles per hour. Another improvement is the use of a combined folding step and side lifeguard under it. When the motorman pulls up the step the guard comes into position. The lighting and ventilation on both decks are improved, the light being more evenly distributed and the ventilation improved to prevent draughts.

Proposed Electrification in Hungary

Present conditions indicate the necessity for electrification of Hungarian railways. Although the Government has not arrived at any decision regarding this matter, it is proposed ultimately to electrify all trunk lines radiating from Budapest—a total of about 870 miles, or 1,245 miles including double tracks. No decision has been reached as to the system of electrification, though a new split-phase system, somewhat similar to that of the Norfolk & Western Elkhorn grade, will be given a trial. An experimental run will be started about the end of April on a short line of about 15 km., equipped with overhead construction. If the test proves satisfactory, a definite decision will be arrived at next year, and general electrification will be pushed as rapidly as financial and manufacturing conditions will permit.

New Car Company to Start Operation

The Missouri Car Company, incorporated in Missouri in September, 1920, for $500,000, has purchased a ten-acre tract with building 567 ft. by 102 ft. in East St. Louis and announces it will begin on June 1 the manufacture of trucks for one-man cars under patents by Theodore A. Brewster. Mr. Brewster was formerly with the St. Louis Car Company and the J. G. Brill Company. He will be vice-president and chief engineer of the new company. Edward S. Stebbins will be president of the company. He has been Western manager for a large Western corporation manufacturing hydraulic equipment and has lived in St. Louis six or seven years.

In describing his patents Mr. Brewster says his "non-rollicking" truck will be in the light-weight safety class, specially designed for cars of the Birney type. A feature is that the lower section of the journal box is removable, thereby making it possible to remove wheels and axles without disturbing the journal boxes. The side frames of the truck are of standard I-beam sections. The truck is designed strictly in accordance with A.E.R.A. principles, making it possible to use axles and wheels out of any A.E.R.A. trucks without change. It will manufacture all types of steel cars for city and suburban service, also large motor bus bodies. The company expects to employ 500 men. It will probably be in the market for steel sheets and structural shapes of various weights and sections, also malleable castings.

Municipal System Planning Two Hundred Car Purchase

Inquiries have been made and specifications are being prepared for 200 Peter Witt type cars for the Detroit Municipal system. Bids for the construction and furnishing of these cars will be asked for soon after the election if a favorable vote is cast on the taking over of the city lines of the Detroit United Railways. The Peter Witt cars will be purchased to replace about 340 single-truck cars now being operated by the Detroit United Railway. The commission plans on improving the service by rerouting certain cars and providing new and clean cars to replace the older cars which are now being used.

Rehearing Sought on Lumber Interests

Rehearing of the open price association practice in trade or modification of the decree in the hardwood lumber to permit of the collection and dissemination of production, sales and stock reports has been requested of the United States Supreme Court in a petition filed by the American Column & Lumber Company, the defendants in the recent suit in which the court decided the practice was illegal because in violation of the anti-trust law. The lumber interests base their request on misinterpretation of certain phases of the case, and make general denial of the conclusions of the court that the purpose of the practice employed by the lumber interests was to curtail production or enhance prices.

Metal, Coal and Material Prices

Metals—New York	April 4, 1922
Copper, electrolytic, cents per lb.	12.675
Copper wire base, cents per lb.	14.062
Lead, cents per lb.	4.90
Zinc, cents per lb.	5.10
Tin, Straits, cents per lb.	29.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.575
Somerset mine run, Boston, net tons	1.875
Pittsburgh, mine run, Pittsburgh, net tons	1.85
Franklin, Ill., screenings, Chicago, net tons	2.05
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.90
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	84.00
White lead, (100-lb. keg), N. Y., cents per lb.	12 25
Turpentine (bbl. lots), N.Y., cents per gal.	68 00

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Rolling Stock

Pittsburgh Railways has ordered forty cars from the Standard Steel Car Company.

Binghamton (N. Y.) Street Railway, through William G. Phelps, receiver, recently awarded a contract to the Cincinnati Car Company for seven new double-truck steel cars at a cost of $71,545.

Tampa (Fla.) Electric Company will purchase twenty single truck Birney cars and four double truck cars if the funds for the program of improvements are voted at the meeting of the stockholders in Tampa on May 2.

Brooklyn (N. Y.) Rapid Transit Company will expend $860,000 in converting several cars into the one-man type and for reconstructing tracks of several lines. Mr. Garrison, receiver, said that the present financial condition of the company warranted this expenditure to rehabilitate the company's service.

Track and Roadway

Calgary (Alta.) Municipal Railway has asked the City Council to approve a recommendation for the rehabilitation of the electric railway. It is reported that approximately $24,000 a year for ties and about $40,000 a year for subbase will be required during the next eight years.

United Railways, St. Louis, Mo., following approval by the receivers, is placing orders for material to construct fifty motor cars of the Peter Witt type to be built in its own shops. The new cars will be of the same general construction as fifty-one motor cars built last year. The approximate cost is $500,000. A total seating capacity of sixty passengers will be provided and the approximate weight will be 35,000 lb.

Tacoma Railway & Power Company, Tacoma, Wash., will share in the repairing of Broadway, from Seventh to Seventeenth Streets, at a total cost of $175,000, by the relaying of tracks and standing a portion of the paving expense. The new rails required will cost $20,910. Laying new ties and foundations, tearing out old tracks and paving approximately one-third of the width of the street will cost between $60,000 and $70,000, making a total expense of $90,000 to the company.

Seattle, Wash.—To finance the purchase of rails for use on First Avenue, to be installed in connection with new paving there, the city of Seattle, Wash., may resort to giving bonds to the manufacturers in payment for material and to the contractor who performs the work. A bond issue of $680,000, including this project, has long been authorized, but the securities failed to sell recently, although publicly advertised. Corporation Counsel Walter F. Meier has begun preparation of an ordinance directing the Board of Public Works to prepare plans and specifications for the improvement.

Columbus Railway, Power & Light Company, Columbus, Ohio, has several important improvements in prospect which were recently approved by the stockholders. These include paving of the company's share of Front, Third and East Main Streets, installing a double track on Third Street, extending the tracks used by Leonard, Linden, Mount Vernon and Shepard cars directly east on Spring Street to Cleveland Avenue instead of turning at Chestnut, Naghten and Fourth Streets.

Cincinnati, Ohio.—Plans and specifications for Section No. 6, the longest stretch of the rapid transit loop for Cincinnati, have been completed by the Rapid Transit Commission. The unit is to be built in the open and will extend a distance of approximately 3 miles. The estimated cost is $399,635. Bids on the construction will be advertised at once. Frank Krug, chief engineer, reported at the meeting of the commission that of the $6,000,000 bond issue voted for the rapid transit loop bonds to the amount of $3,300,000 had been issued and sold and that the commission had remaining $2,700,000 to be sold.

Indiana Service Corporation, Fort Wayne, Ind., track extensions to the site of the International Harvester Company plant east of the city will be delayed until actual work is started on the new plant, according to S. W. Greenland, general manager of the railway. Plans have practically been completed for the work, Mr. Greenland said, but the two lines called for in the contract between the traction company and the Harvester company will not be started until more definite information is available. The corporation, said Mr. Greenland, is now devoting its efforts to the erection of a high-tension line from the Decatur interurban road to the Fort Wayne, Van Wert & Lima electric system, to provide feeders for the Harvester company plant for power and lighting.

Power Houses, Shops and Buildings

Toledo & Indiana Traction Company, Toledo, Ohio, is planning a new interurban freight station at Washington and Ontario Street.

Hagerstown, Md. — The Western Maryland Railway and the Hagerstown & Frederick Railway have entered into a contract by which the former will dismantle its electric power generating plant in the shops at Hagerstown and thereafter purchase power from the Hagerstown & Frederick Railway.

New Orleans Railway & Light Company, New Orleans, La., is revising plans perfected thirteen years ago for the erection of an office building. The company's headquarters were recently destroyed by fire. If found suitable with changes adaptable to present construction methods an up-to-date building will be erected upon the old site at Common and Baronne Streets. Meanwhile the company's headquarters temporarily will be at 421 Baronne Street.

Rutland Railway, Light & Power Company, Rutland, Vt., has removed its motor-generator set from the Rutland substation and installed it at Castleton Corners. This will supply the railway with 60-cycle current at this point and is the last change necessary to transfer the railway load from 25 to 60 cycle. A new 60-cycle generator for the Cavers Falls generating station, which is replacing a 25-cycle machine, is now being installed.

Seattle, Wash., city officials are considering steps to reduce the amount of power purchased from the Puget Sound Power & Light Company to operate the Seattle Municipal Railway. The City Council utilities committee has ordered a favorable report on a resolution by Councilman Philip Tindall, calling on J. D. Ross, Superintendent of City Lighting Department, for a statement as to the earliest date at which the light plant will be ready to take over 5,000 kw. of the railway power load. Under the contract of purchase for the traction property, the city has a right at any time after March 1, 1922, to take over 5,000 kw. from the load now being furnished by the Puget Sound Company by giving one year's notice.

Trade Notes

The Uehling Instrument Company, manufacturers of CO_2 recorders and other fuel economy equipment, announces that the principal office of the company is now located at its factory in Paterson, N. J., instead of at the former address, 71 Broadway, New York City.

Combustion Engineering Corporation, New York, N. Y., announces the opening of a new branch office at 1137 Guardian Building, Cleveland, Ohio. This office will be in charge of Frank Henderson, who has been associated with several of the most prominent stoker companies in this territory for many years.

Largest Order for Power-Saving Devices.—A note in this department in the issue of March 25 regarding the recent Philadelphia order for Economy watt-hour meters referred to it as "probably" the largest order for power-saving devices ever placed. The comparison intended was in amount of money involved. The Brooklyn order in 1920 for 2,400 Arthur recorders is claimed still to hold the record for number of devices sold on a single order.

Chester F. Gailor has resigned as consulting engineer of the Trackless Transportation Company, New York City, to devote his attention to other business with which he has been closely associated. He was in 1913 made assistant chief engineer of the United Railways & Electric Company, Baltimore, and before that was with the Hartford division of the Connecticut Company.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors — HENRY H. NORRIS, Managing Editor

HARRY L. BROWN, Western Editor — C. W. SQUIER, Associate Editor — CARL W. STOCKS, Associate Editor — G. J. MacMURRAY, News Editor

N. A. BOWERS, Pacific Coast Editor — H. S. KNOWLTON, New England Editor — DONALD F. HINE, Associate Western Editor — R. E. PLIMPTON, Editorial Representative

PAUL WOOTON, Washington Representative — ALEXANDER McCALLUM, British News Representative — ROBERT M. HAIG, Special Consulting Editor

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Obstacles to Success in the Membership Campaign

THE campaign for new railway and manufacturing members for the American Electric Railway Association is now in full swing. The active co-operation of the whole present membership is being enlisted. While the "prospect list" is not a long one, as measured by mileage or business done, yet all companies listed ought to be in the association for their own benefit and for the good that they can do the industry.

The fact that there are any names on the prospect list shows that real or fancied reasons for non-membership exist in the minds of the prospects. These the present members must meet. The most formidable is that "the benefits of association membership, while undoubtedly great to others, are not available in our case." The attitude thus expressed simply indicates that the scope of operation and the effectiveness of the association machinery are not clearly understood. Another obstacle is a supposed lack of funds, which simply means that available funds are assumed to be needed more for other purposes than this. Again, there is lack of appreciation of what association membership is worth. There is a danger that indifference to the real best interests of the local railway or manufacturing property may lie at the root of the whole difficulty.

In exhibit years there was an extra and compelling reason for manufacturers and railways being in the association. They would otherwise miss a great opportunity. The lack of an exhibit last year thus undoubtedly affected the membership somewhat. This obstacle to enlistment in association ranks has been removed by the decision of the association at Indianapolis that the exhibit feature of the convention will be restored this year.

What's Meant by Publicity Anyhow?

IT'S a safe wager that if you asked an electric railway man what publicity means, he would answer: "Publicity is telling the public why we are entitled to such and such a fare or why we shouldn't pay taxes or why we have the right to the public highways, etc." In short, he might say: "It's the art of telling the public about our rights and our wrongs."

But suppose you asked a merchant to define publicity. What would he say? Wouldn't he be likely to reply something like this: "Publicity is the art of telling the public that your goods are not only desirable but good value for the money." Can you conceive a merchant using space to point out that the pushcart peddler pays no rent and only a nominal license fee? Just how much difference is there between that and the usual anti-jitney campaign which does not realize the import of that truly American slogan: "Every knock is a boost"?

In a recent case, a company which has used many columns of newspaper space to chide the public for permitting jitneys was ordered to furnish certain short ride service at a lower fare. One would have expected that a car card or dasher sign at least would have been used to set forth the merits of the reduction as a reason for increased patronage. Nothing of the kind has been done. The tragedy is that the management in all honesty believes it did all that was necessary by merely refraining from cutting service under the lower fare. The idea that a car ride cannot be sold as readily as "Sunstruck Prunes" betrays what the modern psychologist would call an "inferiority complex." Is it that the electric railway manager feels that no one ever takes a trolley ride unless compelled by bitter necessity? If he feels that way about it, why doesn't he enter another field and leave the job to those who know that the electric car, nine times out of ten, offers the biggest value for the money—and the greatest usefulness, too—to practically every element of the community.

Lakeside Power Plant a Big Undertaking

WHATEVER the final outcome as to the over-all operating efficiency and economy of the new Lakeside generating station of the Milwaukee Electric Railway & Light Company, one must admire the courage displayed in daring to pioneer on so big an undertaking as a 200,000-kw. station completely built around the idea of burning coal in pulverized form. For if this plant proves to be capable of producing a kilowatt-hour on fewer heat units than is being done in our modern stoker plants, then a development of far-reaching importance has been made available to the whole electrical industry. But with the prospect of taking on all the difficulties that go with an initial departure from standard practices, it was of no small moment when the decision was made to risk an enormous investment, and perhaps reputations, on a radically new fuel combustion system as applied to central station work, with but a small trial installation and tests as the basis of the decision.

The station was constructed during the year 1920 under conditions particularly adverse to the realization of a low construction cost. Labor cost was at its highest level. The severe cold and the location of the plant away from the city and transportation made it necessary to build and operate three construction camps for 200 men each in order to keep the men on the job even at the high wages. Much of the mechanical equipment had to be designed originally for this plant, involving a high development cost on top of the generally high equipment costs prevailing during 1920. The whole construction work was necessarily carried on under great pressure on account of the immediate need for additional generating capacity. There was the necessity to excavate a 70-ft. embankment at the lake side in order to put the condensers down where there would be no waste in lifting the large quantity of condensing water. And in order to provide the suitable intake reservoir for the condensing water it was necessary to spend $400,000 in dredging work and building a rubble mound.

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Despite these unfavorable conditions, an allocation of the present investment over the ultimate capacity of 200,000 kw. shows a construction cost per kilowatt capacity of $106.51. Elimination of the large item for the rubble mound and unusual amount of other marine, tunneling and excavation work, in order to put Lakeside on a more nearly comparable basis with the construction work on other recently built large generating stations, would seem to bring the cost of Lakeside into a favorable position.

There has not been sufficient time as yet to complete the research work involved in this development, nor have all of the opportunities been exhausted for research opened up in connection with the development of numerous original ideas which are incorporated in the design of this plant. However, the long series of tests made under the auspices of the United States Bureau of Mines have provided the basis for strongly expressed confidence on the part of the designers of the plant that their original expectations as to operating efficiency will be fully met. It is expected that full operating figures of the new station will later be made available. The true extent to which powdered fuel burning may affect future central station design will then be determinable.

Apply Modern Parts to Old Equipment Where Possible

THE task of furnishing more reliable service and of extending the life of railway operating equipment is an ever-present one with the superintendent of equipment and the master mechanic. Thoroughgoing maintenance includes both of these. Reliable service results from keeping all parts in a condition that will obviate trouble. Greater life from the various parts can come only with the use of better materials in construction and better methods in care and assembly and the selection of more satisfactory designs. But in the problems of maintenance the application to old equipment of improvements incorporated in late designs of equipment has not received the attention that it merits.

In an article in this issue John S. Dean discusses some improvements which form a part of most recent motor designs and which can be incorporated in old-type railway motors with beneficial results. For example, a number of modern designs of brush-holders are available for some of the old-type motors and, in cases when the complete brush-holder cannot be used, repairs can be made frequently with such improved parts as springs, ratchets, contact tips and braided shunts.

These changes from old designs have come about through the efforts of the manufacturers to improve their products and through results obtained in exacting service. Their adoption and application to present equipment will result in longer life and better service. Some improvements, like the use of spring pads under field coils to keep them tight, of brass or copper sleeves on brush-holder and field leads and of fiber or wooden cleats for wiring around the frame, are very simple and can be readily adopted without great expense.

With new equipment maintenance costs are comparatively low. But when repairs are necessary, methods and materials found most satisfactory by the manufacturer should be used. The use of correctly shaped armature coils, of pure tin solder instead of ordinary half-and-half solder and of a high grade of tinned-steel banding wire will do much toward producing high-class repairs. Proper maintenance means something more than restoring parts to their original new condition. It should include the use of the most modern parts and up-to-date methods.

Concentrate on Incentives for Best Results in Organization

WHY does a man who is in business for himself work, in general, with more satisfaction and interest to himself than one who works for others? In spite of his longer hours and greater financial risk, he is happier in his work provided that he has the requisite talent for business. The reason for this is obviously that he benefits directly by the results of his efforts and he is able, within limitations imposed by his financial and personal capacity, to carry out his ideas promptly. From this point of view it would seem as if everybody would want to get into business, but it is perhaps fortunate for the industrial condition of the country that only a small part of the population of the country have sufficient business capacity to enable them to be their own employers. Most of them must work for others, but if they are to do their best work they must be furnished an environment as nearly as possible like that which would surround them in their own business.

Recognizing the fact that the ideal condition for work is that under which the employee receives some tangible recognition for good service, electric railway managers are showing an increasing interest in bonus or premium plans of various kinds. Even where actual bonuses are not offered as rewards for good work, the fundamental principle underlying them is recognized. The problem of the executive is to furnish the most potent incentives to good work. What these incentives will be in each case is an individual problem to determine, but the manager must find them if he is to succeed largely. Probably the most extensive system in use is that employed in various departments of the Milwaukee Electric Railway & Light Company. It was inaugurated on a small scale in 1912 and since has been extended. The United Railways of St. Louis adopted a somewhat similar system in 1917. The plan of paying bonuses for fuel saving has been extensively used in power plants, as by the Manila Electric Railway & Light Company, and for accident reduction on a number of properties. Thus, last Christmas, the Los Angeles Railway distributed about $90,000 in awards to transportation employees, graduated on the basis of performance in this respect. Many received $60, and some as much as $120 for the year.

Money bonuses are not the only way of providing an incentive. The same result has been secured as in Philadelphia by making the men feel that they will participate in the prosperity of the company. A regular profit-sharing system is followed on the Pittsburgh, Butler & Harmony Consolidated Railway & Power Company under the McCahill plan and is included in the new franchises under which the combined urban railways of Paris (France) are now operating.

The general application of the piecework system, of which the bonus system is a kind of offshoot, is more difficult in the transportation departments of electric railway properties than in the shops or in manufacturing or mercantile operations. The difficulty should, however, be a challenge to effort rather than a discouragement. Employees are quick to recognize an interest in their welfare on the part of executives. If this interest takes a practical, but non-patronizing form, the reaction will be prompt and profitable.

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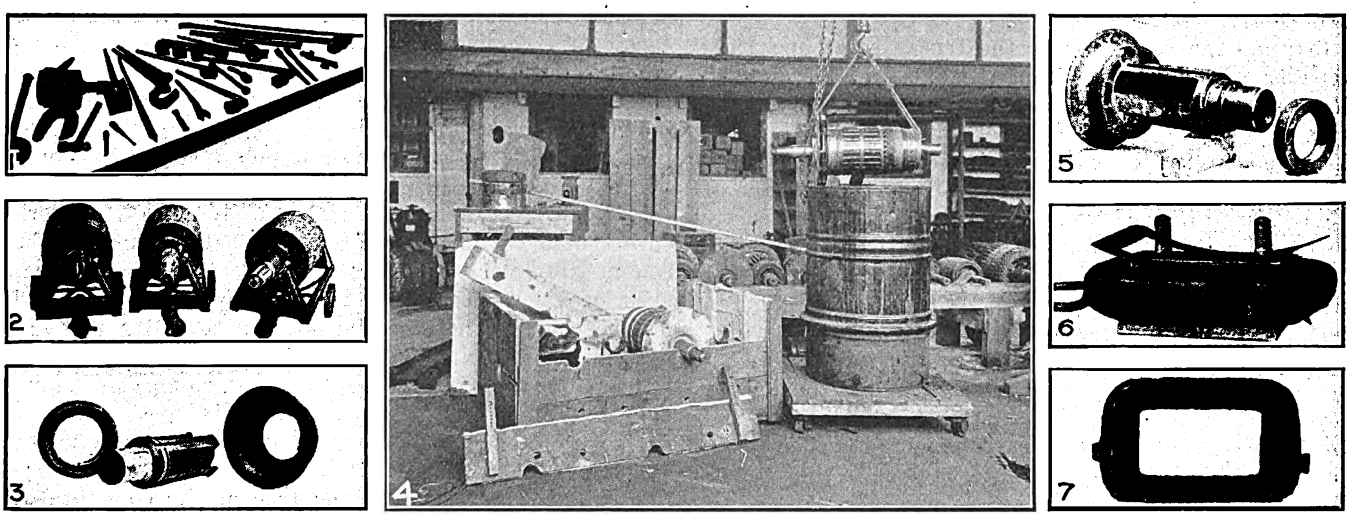
Revamping Old Railway Motors

Many Improvements Which Form a Part of Recent Motors Can Be Incorporated in the Old Types to Reduce Trouble and Decrease Maintenance Costs—Manufacturers' Methods Can Be Used to Advantage When Making Repairs

BY JOHN S. DEAN
Railway Motor Engineering Department,
Westinghouse Electric & Manufacturing Company

SOME of the older types of non-interpole railway motors have made a commendable record for themselves and have many staunch friends among the operating men in various parts of the country. In some instances, this loyalty is so pronounced that it would require considerable effort to persuade these operators to replace their older motors by the more modern types, even though figures were produced to show a considerable saving in power and maintenance charges. On the other hand, there are a number of operators who, al-



HANDY TOOLS AND IMPROVED DETAIL PARTS REDUCE MAINTENANCE COSTS

No. 1—Handy tools for overhauling.
No. 2—Railway motor armature shaft repaired by electric arc welding.
No. 3—Armature spider with detachable rear-end bell—ring key to lock laminations.
No. 4—Dipping and baking outfit made from discarded material.
No. 5—Armature spider and rear-end bell attached in one piece—ring nut to lock laminations.
No. 6—Main field coil with leads coming from the body of the coil and flat steel spring washer for keeping coils tight.
No. 7—Main field coil with terminals at ends for connecting leads.

though great admirers of these older motors, would no doubt replace them with the more modern motors and by so doing increase the earnings of their company, but the necessary money to make this change-over is not available. Both of these classes and many others now using these older motors are interested in the possibilities of bettering the operation and extending the life of the detail parts of older motors by adopting some of the following ideas which may be applied when these motors are being repaired or overhauled. Some of the important considerations to be followed are:

1. It is essential to provide the necessary and most efficient tools and equipment in order to overhaul and repair these motors in good, workmanlike manner and without danger of possible damage to any of the detail parts.

2. It is desirable to have several spare complete motors and armatures available so that when overhauling motors this work will not have to be rushed through the shops. This will encourage careful, consistent work on the part of the men and will result in a more dependable rebuilt motor.

3. In replacing worn parts, a better grade of material should be substituted wherever possible to insure a longer life of these parts.

4. It is necessary to adopt all the improved methods of reconstruction, including up-to-date processes and treatments, and to use greater care in the assembly of the various parts of these motors.

5. All improvements in design of the detail parts which are available should be applied and adapted to older motors.

Some of the more important points that should be considered in connection with the revamping of these old motors will be given in detail for the benefit of operators and master mechanics who may be interested in making their motors more reliable and better able to meet present-day operating conditions.

GOOD WORKMANSHIP REQUIRES PROPER TOOLS

An extremely important factor in doing any kind of work is that it be done by efficient and reliable mechanics who are provided with the necessary suitable tools and equipment. There is nothing so discouraging to any kind of a workman as to be forced to do a job without the aid of the necessary tools adapted for the work in hand. Of course, the job will be done, but generally in a heartless, shiftless sort of way and when completed it may or may not hold together in service. A good selection of small tools, snug-fitting, open-socket and special-type wrenches, flat and pointed steel bars, pullers, jacks, hoists, etc., placed in the hands of the average workman will do much toward producing very good results in the maintenance and upkeep of railway equipment.

In making repairs or when overhauling motors there

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are times when this work must be rushed through the shop so as to get the required number of cars out on the road to handle the rush-hour crowds. Granted that special rush jobs are sometimes forced upon the shop and cannot be avoided, there are instances where this method of making repairs becomes a habit with operators and all work is handled in this manner, resulting in establishing a standard of poor workmanship, which tends to increase the ultimate maintenance expense. A motor repaired under these conditions is only a makeshift job in many cases, and is very likely to be back in the shop again in a short time for other troubles that should have been detected when in for repairs the first time. It is needless to say that this oversight or apparent neglect on the part of the workmen is largely due to lack of time. This condition can be almost entirely remedied and, further, cars can be put back in service quicker by having extra motors to replace those taken from the cars for repairs or for overhauling. In the case of the split type of motors a number of extra armatures also greatly facilitates repairs and replacements.

In removing motors from the trucks some operators consider it advisable to keep the axle caps so marked that they go back on the same motor from which they were originally taken. Further, the axle bearings, if they are still in good running condition, are wired onto the axle in their original location. It is the practice of other operators wherever possible to have the partly worn pinion put back on the new or repaired motor on the same axle so that the original gear and pinion again work together. These precautions have been found to work out to advantage, as better fits are obtained which tend to reduce friction and noise of the car. After being removed for repairs the motor should be thoroughly blown with compressed air, and the surface scraped and cleaned of all dirt and grease. The motor is then taken apart and the work of overhauling is done in the various shop departments.

Heat-Treated Shafts Prevent Trouble

Worn and damaged shafts are usually repaired by means of the arc-welding process and if carefully done by experienced workmen this has been found to be quite successful, although it is well known that the structure of the steel is more or less weakened by this process. On properties that have considerable shaft trouble this condition can be greatly helped by the adoption of heat-treated shafts that are very much tougher and have approximately 60 per cent higher elastic limit than the ordinary axle steel shafts. These shafts have a tendency to wear less at the journals and will stand much more severe abuse under heavy loads, and are less likely to break. When using heat-treated shafts it is not advisable to do any electric or gas welding on them unless they are re-heat-treated after being welded.

Some of these older motors tend to develop loose iron on the spiders of the armatures, which some operators believe is largely responsible for broken armature leads. In a great many cases it will be found that these spiders are used in connection with a detachable rear-end bell generally made of cast iron with the laminated core iron held under pressure on the spider by a ring key locking device. Experience has shown that these end bells work loose, and in some cases the ring key springs out of place, thus allowing the laminations to move on the spider. An improved construction of spider that will overcome this trouble has the spider and rear-end bell cast in one piece made of malleable iron or steel, and with a ring nut at the commutator end threaded on the spider to hold the laminations under pressure. When this design is used in connection with old laminations it is advisable to have the spider furnished machined at the fit of the iron, from 0.010 to 0.012 in. over size, so that the old iron will be a tight driving fit on the spider. There may be some objections to the spider and end bell cast in one piece as it requires a more expensive renewal charge when the end bell is broken and needs replacement. But experience has shown that with this new type of construction made of malleable iron the end bell is not so readily broken and consequently requires less frequent renewals. The benefit derived from this more rigid construction more than offsets the anticipated objection.

Use Good Grade Mica

If the commutator is worn down and needs refilling with a complete set of new segments, care should be taken in the assembly to use a good grade of properly treated and built-up mica cones or V-rings, and to tighten the commutator while not under pressure to secure a good solid job. It is advisable to consider the use of malleable iron or steel V-rings and spider if these parts have given trouble in service due to cracking or breaking. If the commutator is not worn out and only needs truing up, this should be done in a lathe after the armature is wound and soldered. In doing this work care should be taken not to cut down the width of the commutator neck, as this would reduce the contact area of the leads soldered into the commutator and might result in their heating up and becoming loose in service. After turning and truing up the commutator some operators grind its face, using a fine abrasive stone held in the tool post of the lathe. This gives a smooth surface and tends to increase the life of the commutator and the carbon brushes. It is considered good practice to round off the edges on the face of the commutator as this helps to keep down flashing. The mica should be under-cut about $\frac{3}{64}$ in. and all particles or slivers of mica in the under-cut grooves removed. The insulation over the front V-ring should be thoroughly coated with a good grade of insulating varnish.

In rewinding, correctly shaped coils should always be used, thus permitting the winding operation to be made with the least abuse to the coils to get them down in place. There is a tendency to use a cheap make of coils which are poorly formed and lacking the required insulation at their weak points. When being wound these coils require more or less pounding and abuse and result in a finished armature that will soon break down in service. This is poor economy, as coils of a higher first cost which are properly formed and insulated will make a much easier winding job and will give a better armature that will stay out on the road. In connecting the windings, information as to the throw of the coils and the leads should be checked carefully with the winding diagrams furnished by the motor manufacturer.

If there is a tendency for the armatures to run hot in service and throw solder from the commutator necks it is advisable to solder these leads with a pure tin solder instead of the ordinary half-and-half solder, as the tin solder will stand higher temperatures and will not soften as readily, thus reducing the possibilities of the leads becoming loose in the neck. An acid flux should not be used in soldering. Alcohol and rosin make a good flux and will not damage the insulation.

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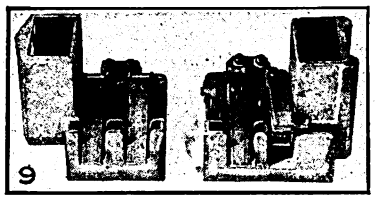
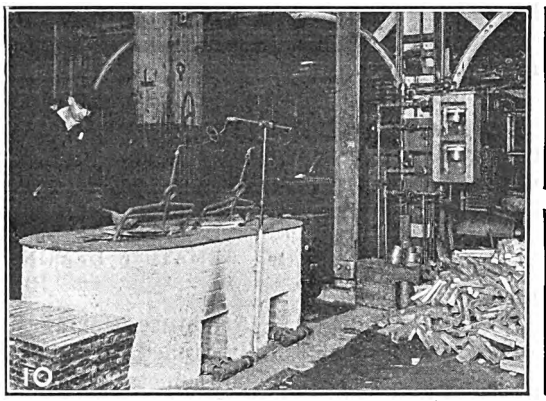
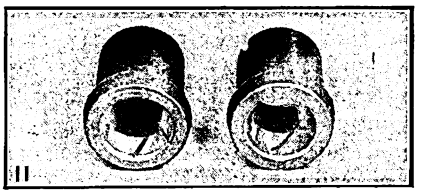
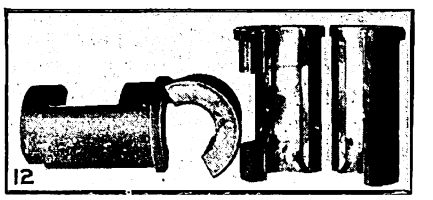





BRUSH-HOLDER AND ARMATURE BEARING MUST BE KEPT IN GOOD CONDITION

No. 8—Brush-holder spring tension fingers with various detail parts completely assembled—at left, old type; at right, new type.
No. 9—New design brush-holders for old-type motors.
No. 10—Automatic temperature control for babbitting pots.
No. 11—Solid type pinion end armature bearing.
No. 12—Split type pinion end armature bearing.

While soldering the pinion end, the armature should be raised from 6 to 8 in. above the commutator to prevent the solder from running into the windings back of the commutator neck, as this will result in short circuits. Still better results will be obtained by doing the soldering at the side of the commutator instead of on the top.

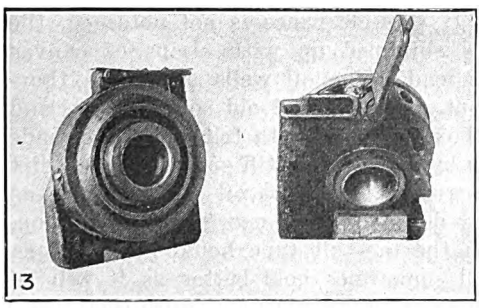
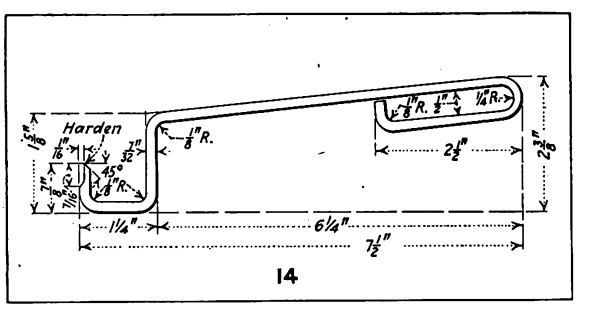
Band Hot to Secure Tight Armatures

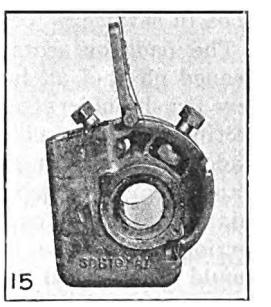
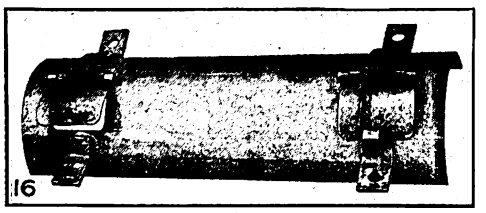
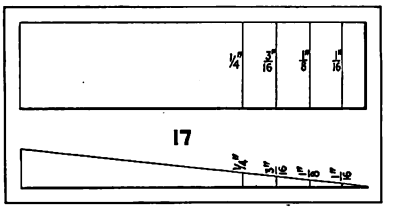
Banding armatures while hot gives a much tighter and more durable banding job, as it allows the coils to be pulled tightly down into the slots. It is preferable to use a high grade of tinned steel banding wire. If these bands are soldered with pure tin solder, instead of the ordinary half-and-half solder, they will hold together better in service, as the tin solder will stand higher temperatures before it will soften and allow the individual band wires to slip and become loose. Narrow strips of tinned sheet steel about 0.012 in. thick placed under the core band entirely encircling the armature, to which the band wires are soldered, strengthen these bands and reduce the tendency for them to become loose.

When the armature is completed, either dipping or rolling in a good grade of insulating varnish and baking at a temperature of from 95 to 105 deg. C. will increase its usefulness, as this will: (1) Fill up all the cracks in the insulation on the coils opened up during the winding process, and keep out the dirt and moisture; (2) tend to hold the coils solid in the slots, thus reducing vibration, and (3) form a good insulating coating over the entire surface of the armature, which reduces surface creepage.

Operators following the above practice report an increase in the life of their armatures, this being especially noted during the winter season when the equipment is subjected to severe moisture, water and snow conditions.

It is considered best practice in connection with all modern motors, and is recommended for old motors, to use cables coming out of the body of the coil instead of the heavy brass terminals to make the wiring around the frame connections. The main objections to the use of terminals is that they are more likely to break off due to vibration, or to develop loose connections which finally burn off the leads. Another disadvantage is the difficulty of properly insulating these terminals after the connections are made. Field coils should be well insulated and then dipped in a good grade of insulating varnish and baked. The dipping and baking should be repeated several times. Impregnating coils in an asphaltum gum further improves the insulation and makes a solid, compact coil that will better resist breakdowns.

VARIOUS TYPES OF HOUSINGS AND DUST SHIELDS FOR RAILWAY MOTORS

No. 13—Tap bolt type housing for split frame motor.
No. 14—Cold-rolled steel brush-holder spring tension adjuster.
No. 15—Through bolt type housing for split frame motor.
No. 16—Sheet steel axle dust shield fitted with inspection holes.
No. 17—Hardwood distance spacer for spacing brush holders from commutator.
No. 18—Malleable iron adjustable axle collars with double adjusting bolts.

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Porcelains on the brush-holders should be kept clean and tight on the pins to prevent creepage of the current to the ground. If the moving mechanism becomes screechy and stiff, a little signal oil should be added to the moving parts. When repairs are necessary, the improved parts such as steel spiral springs, fifteen-tooth steel ratchet, flat contact tips and the heavier flat braided shunts soldered to the brush-holder castings should be used, as these parts tend to give longer life and better service. Pressures should be adjusted to approximately 5 to 6 lb. per finger. However, if there is a tendency for the motor to flash in service it is advisable to increase this pressure to approximately 8 to 9 lb. per finger. Various modern designs of brush-holders are available for some of the older type motors and their use is recommended. Where these modern-type brush-holders have been used in place of the old original holders, better results have been obtained in connection with the operation of these old motors.

All dirt and grease should be cleaned from parts of the motor frame inside and outside, and the drain holes in the bottom of the frame should be kept open. After thoroughly cleaning, the inside of the frame should be painted with an air-drying insulating varnish. On split motors the surfaces at the split and at the housing or bearing seats should be well cleaned, removing all burrs and high spots by means of a file.

In replacing field coils sufficient spacing washers, preferably of sheet steel, should be used under the coil to insure a tight fit of the coil. In addition to the washers, the use of a flat steel spring washer is recommended to prevent coils from vibrating and chafing which would finally damage the insulation. These washers and springs should be temporarily taped to the field coil to prevent them from working out of place while the coil is being assembled on the pole. The surface of the poles and pole seats should be thoroughly cleaned and all high spots removed by filing before putting together.

Poles may be driven into place by means of a block of wood or a chunk of babbitt, but should not be pounded with a sledge. When pulled up tight these may be tested by hitting lightly with a hammer and noting the sound. Under the heads of all tap bolts and nuts on stud bolts used to hold the poles in place a lock washer should be used to insure that these parts will not work loose in service.

The pads or seats for the brush-holders should be cleaned off and all burrs removed and the repaired or new brush-holders securely clamped in place. In connecting up the field coils reference should always be made to the winding diagrams furnished by the motor manufacturer, which give the correct method of doing this work. After coils are in place and temporary connections are made, the polarity of the various coils should be checked to insure the flow of the current through the coils in the proper direction to produce the required magnetic field strength.

The soldering of all connections to the field coils and wiring around frame leads should be made by or under the direction of some one man experienced in this work to insure a good electrical job. All leads should be cleaned and tinned before soldering. Brass or copper sleeves should be used on the brush-holder leads and on field coil leads when terminals are used on the field coils. If, for any reason, sleeves cannot be used, the wires of the cable should be soldered together. When cables are in place all set screws on the field coil terminals and the brush-holders should be drawn up tight and locked. The field-coil terminals should then be well insulated and shellacked and painted. Leads should be well cleated and protected by wood, fiber or rubber bushings where they pass through the motor frame. The leads coming out of the motor frame should be marked plainly so that the workman will not have any difficulty in making the right connections to the car wiring.

ARMATURE BEARINGS NEED THOROUGH CLEANING BEFORE TINNING

Armature bearings if made of bronze should be carefully tinned and lined with a good grade of tin base babbitt metal. In doing this work the bearing shell should be thoroughly cleaned before tinning. While pouring the babbitt metal its temperature should be kept at from 460 to 482 deg. C. in order to get the best results. After bearings are lined, if the job has been well done the finished bearing will sound with a clear metallic tone when hung up by a wire and tapped with a piece of metal. Malleable-iron bearing shells if tinned before lining with the babbitt will tend to prevent the lining of babbitt from cracking away from the shell, and will give very much longer life in service. On some of the older types of motors, the pinion end bearings were split to facilitate repairs. Where the split type of bearings are used, longer life and better service will be obtained by replacing them with the one-piece solid type of bearing. All bearings should be provided with oil grooves and have the edges at the window chamfered to allow the oil to find its way into the surface of the journal throughout the bearing. If bearings are loose in the bearing seat it may be necessary to use an oversize shell. Some operators have used a shim of thin sheet iron to tighten loose bearings and report fairly good success. Other operators have expanded their bronze bearing shells by forcing a mandrel through them, to make them tight in the housings, and have found this to be quite successful.

CLEAN OIL WELLS CAREFULLY

Housings in split-frame motors should have a good clamping fit between the two halves of the motor frame. After the two halves of the frame are clamped together on the housing the clearance at the split as measured at the commutator and pinion end should be from 0.008 in. to 0.012 in. If this clearance is not obtained, the housings may be shimmed up with strips of canvas treated in white lead. The oil wells should be thoroughly cleaned out, removing all old soggy waste and dirt, and the oil box lids lined with felt should be made to close positively by means of a stiff spring to keep dirt and water from getting into the oil well. Housings should be securely doweled as an emergency precaution. If the threads in the tap-bolt type housings are worn a longer bolt will sometimes hold better as it will be found that the threads at the bottom of the tapped holes have not been damaged. Where the old tap-bolt type of housings are too badly worn to be used, these should be replaced with the new through-bolt type of housings available, for some of the older types of motors. If the housing seats in the frame are badly worn, an oversize housing should be used to secure a good tight clamping fit. This design of housing fitted with through bolts is now being used by a large number of operators and has done much to reduce the maintenance cost of these parts.

After the armature is assembled in the frame it

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should be carefully checked for the proper air gap and the correct end play. If there is any question as to the air gap being too small, it may be due to the poles not being pulled down tight on their seats. If for any reason the armature end play is excessive this can be remedied by placing thin brass or fiber washers on the shaft between the bearing and wiper rings, or by the use of a steel collar placed over the bearing shell between the bearing collar and the housing. All armatures to give satisfactory operation should have approximately $\frac{1}{8}$ in. initial total end play.

With the armature in place, the brush-holders should be carefully checked and adjusted with respect to the following points:

1. Brush-holder box should line up parallel with the commutator bars.
2. Distance from center line of one brush-holder to the center line of the other brush-holder should be equal to one-fourth the circumference of commutator.
3. Brush-holders should space $\frac{1}{8}$ in. to $\frac{3}{16}$ in., preferably $\frac{1}{8}$ in., from the face of the commutator.
4. Carbons should have a smooth sliding fit in the carbon box of the brush-holder.
5. The carbons should be seated on the surface of the commutator, by means of a strip of sandpaper cut the width of the commutator face.
6. A good grade of unplated graphitized carbon brush is recommended and approved by the motor manufacturer.

Be Sure That Bolts and Nuts Cannot Work Loose

It is very important that lock washers be used under the heads of all tap bolts and under the nuts of all through or stud bolts. Operators are learning the importance of using special heat-treated bolts in connection with the housings, axle caps and frames of railway motors. These bolts have 60 per cent more tensile strength and are tougher and more reliable than the general "run-of-mine" standard hardware bolts, and thus will stand more abuse and are less likely to stretch or break in service.

Bearings should be packed with a good quality of wool waste which has been saturated in an approved grade of car oil for about twenty-four hours. All bearings arranged for side feed and using oil and waste for lubrication depend upon the capillary or wick action of the waste to carry the oil up to the bearing window. Thus, in this type of bearing to insure clean oil reaching the journal, the oil should be poured into the oil well so it must feed up through the waste. If the oil is poured in on top of the waste the tendency is to flood the inside of the motor and to waste the oil. The normal average height of the oil as gaged in the oil well should be $3\frac{1}{2}$ in. maximum and 1 in. minimum for the armature bearings and $2\frac{1}{2}$ in. minimum for the axle bearings.

After field coils are connected up permanently and the armature is assembled in the motor frame, the field coils should be tested for polarity by connecting *F* plus field lead to the trolley through several grid resistors or a headlight resistor and *F* minus field lead to the rails, and with current passing through these coils check the polarity by means of a compass needle. This same testing circuit may be used to give the motor a running test to check the condition of the bearings. Before doing this, it should be made sure that the bearings are packed and oiled and that the carbon brushes are in place. To make this running test, connect *A* plus lead to the trolley circuit, *A* minus lead to *F* plus lead and *F* minus lead to the rails. To reverse the rotation of the armature, connect *A* plus to the trolley *A* minus to *F* minus and *F* plus to the rails. Be sure to open the test circuit after the motor has attained a speed of approximately 800 r.p.m. Test the armature and field windings for ground by means of a lighting-out line connected through a bank of lamps, or by means of an alternating-current testing box. If the motor meets all the above tests satisfactorily it can be passed for service as O.K.

Heat Pinions for Installation

All pinions should be heated in a tank of boiling water for several hours before applying. (Use $\frac{1}{4}$ lb. of washing soda to 5 gal. of water to prevent rusting.) The pinion bore and taper fit on the shaft should be carefully cleaned and all burrs and high spots removed. Keys should have all sharp corners rounded off and should fit properly. The pinion should be driven in place while hot, using a bar of soft metal. On pinions which drive up on the taper too far, some operators report very good results from the use of a paper liner placed between the pinion and the pinion fit.

When mounting the motor on the truck it should be seen that the axle bearings are in good condition, and that the dowels or keys in the axle caps are securely held in place. In addition to the dowels it is essential that the axle caps should securely clamp the axle bearings to prevent movement and rapid wear. To get this clamping action on old bearings worn on the outside, some operators use thin sheets of fiber at the bearing seat, while others have placed metal shims between the two halves of the bearing at the split. Another scheme used to get the desired clamping action is to machine from $\frac{1}{16}$ in. to $\frac{1}{8}$ in. of metal off the axle cap at the split. Special heat-treated bolts fitted with lock washers will hold the axle caps in place more securely. Axle cap oil wells should be thoroughly cleaned out and the oil box covers put in good condition.

If the gear case has a large clearance at the opening for the axle bearing flange it should be provided with two half rings of felt and the grease box cover should be put in good operating condition. If the gear seats on the motor or the suspension pads on the gear case are worn, it is advisable to place sufficient strips of canvas treated in white lead on the gear-case seats to insure that the case will be drawn up tight by the clamping bolts, thus preventing any movement of the two halves.

In order to increase the life of the axle bearings, it is very desirable to provide a reliable dust shield covering the axle between the axle bearings. This shield should be provided with peepholes to facilitate the inspection of the bearing wear. The inspection holes should be protected by a cover which is kept closed by a strong spring so as to keep out the dust and dirt.

In order to take up the end wear of the motor axle bearings, and to keep the motor in its proper position on the axle, thus preventing the gear from cutting through or otherwise damaging the gear case, it is advisable to use a suitable adjustable type axle collar. A good reliable collar for this purpose is made of malleable iron provided with a double adjusting bolt and having an overhanging lip engaging the axle bearing flange which keeps the dust and dirt from working into the wearing surfaces of the axle bearing.

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Convenient Forms Simplify the Making of Cost Records

On Medium-Sized Roads with Limited Office Forces Collection and Preparation of Accurate Data for Costs of Construction and for Maintenance Work Present a Considerable Problem

BY A. J. STRATTON
Assistant Superintendent of Railways,
Eastern Pennsylvania Railways, Pottsville, Pa.

THE head of the maintenance of way department of the medium-sized traction company usually has but little time to devote to extensive office work. There are, however, certain records that for the benefit of all concerned must be compiled. A great deal of this information depends upon the wishes of the management, but some data are necessary for the use of the head of the department. Clerical help is often restricted to the services of a timekeeper or clerk of material and supplies with the joint use of stenographer with some other department. The result is that the head of the department must give a certain amount of time to the collection and preparation of these data.

On properties where costly valuations have been made or where the physical property of the company is carried on the perpetual inventory system, it is of great importance that a record be kept of the new material that goes into the property, its location, and the time of its use. On reconstruction work this may be most conveniently handled by the work order system. Normal maintenance work such as the installation of ties, the surfacing in open track, replacement of parts of special work layouts, painting and repair of bridges, repairs to bonding, and other kindred charges not usually made under work orders may cost more in a year than all of the reconstruction work, but except for the gross cost, the replacement of materials is lost sight of.

Three reports are in use by the maintenance department of the Eastern Pennsylvania Railways covering trackwork, bonding and welding and repairs to bridges and structures. These reports are made daily by the foremen and collected by the timekeeper who checks the material used and the amount of work reported. Every man on the payroll must be included on these reports. Track greasers and other employees working individually are grouped on one report unless the work performed by the individual is of sufficient importance to warrant an individual report. The trackwalker is an example of the latter. When the work reported is covered by a work order the report is filed under the work order number. Maintenance work is filed under line and division. These reports are made for use on a standard 5-in. x 8-in. card file.

REPORTS SUMMARIZED MONTHLY

At the end of the month reports are summarized and a brief narrative report is made to the general manager's office covering the activities of the department for the month. Lists of material are taken from these reports monthly and are grouped for record purposes under the proper division, and at the end of the year a complete report is made covering all changes to physical property.

From an operating standpoint the compilation of these reports has assisted in increasing the efficiency of the various employees. For example, the number of bolts used by trackwalkers increased 300 per cent the month following the use of the daily report. A study of the

Eastern Pennsylvania Railways Co
Company

Work Order Requisition

W. O. No. ____

Date March, 1 192 [illegible] Executive Au. No. 737

Item	DESCRIPTION OF PROJECT	Charge Account No.	COST Estimated	COST Actual
	Reconstruction of tracks Broad Street, 19th to 23rd Streets, 4750 feet of single track.			
	Engineering and Superintendence	CR-1		
	Grading:			
	Excavation	CR-4-A		
	Removal of excess Materials	CR-4-B		
	Ballast	CR-5		
	Ties	CR-6		
	Rail, Rail Fastening and Joints			
	Rail	CR-7-A		
	Rail Joints	CR-7-B		
	Miscellaneous Fastenings	CR-7-C		
	Track and Roadway Labor			
	Handling and Delivery of Track Materials	CR-10-A		
	Track Laying	CR-10-B		
	Track Surfacing	CR-10-C		
	Joint Welding	CR-10-D		
	Protection of Work (Watchmen etc.)	CR-10-E		
	Miscellaneous Track Labor	CR-10-F		
	Paving			
	Delivery of Paving Materials	CR-10-A		
	Paving Materials	CR-10-B		
	Labor Installing Concrete Base	CR-10-C		
	Labor Paving	CR-10-D		
	Cleaning Up	CR-10-E		
	TOTAL			
	DIFFERENCE			

To be started Date April 1 192[illegible] To be completed Date ____ 192

Reasons and Benefits: Reconstruction necessary on account of debilitated condition of tracks and pavement, also to comply with new grade and pavement to be established by the city.

Issued by M. of W. Department
Estimated by C. J. Brown
Approved by J. J. Smith

Approved Date ____ 192
Gen. Mgr. ____

FORM OF WORK ORDER REQUISITION

work of several foremen engaged in similar work showed a divergence in the production per man too great to have been influenced by local conditions. It was then possible to give those foremen making the poorer showing more supervision and assistance to raise the product of their gangs to a general average. The work report was not designed to take the place of the time report, but the space in the lower left-hand corner showing the number of men and the rates gives the head of the department an opportunity to check the quantity of work produced against the cost. It also gives him an instant perspective of the work of his department day by day, a view presented by facts alone and unsupported by local color in the shape of a plausible story by the foreman.

All engineers are interested in cost data. Auditing departments are usually ready to co-operate as far as they can, but they look upon this work as being of secondary importance to their routine work, with the result that the desired information is not obtainable until long after the completion of the work. All work of importance should be done under the work order system. The maintenance department of the Eastern Pennsylvania Railways prepares work orders that are given numbers by the auditing department. The main

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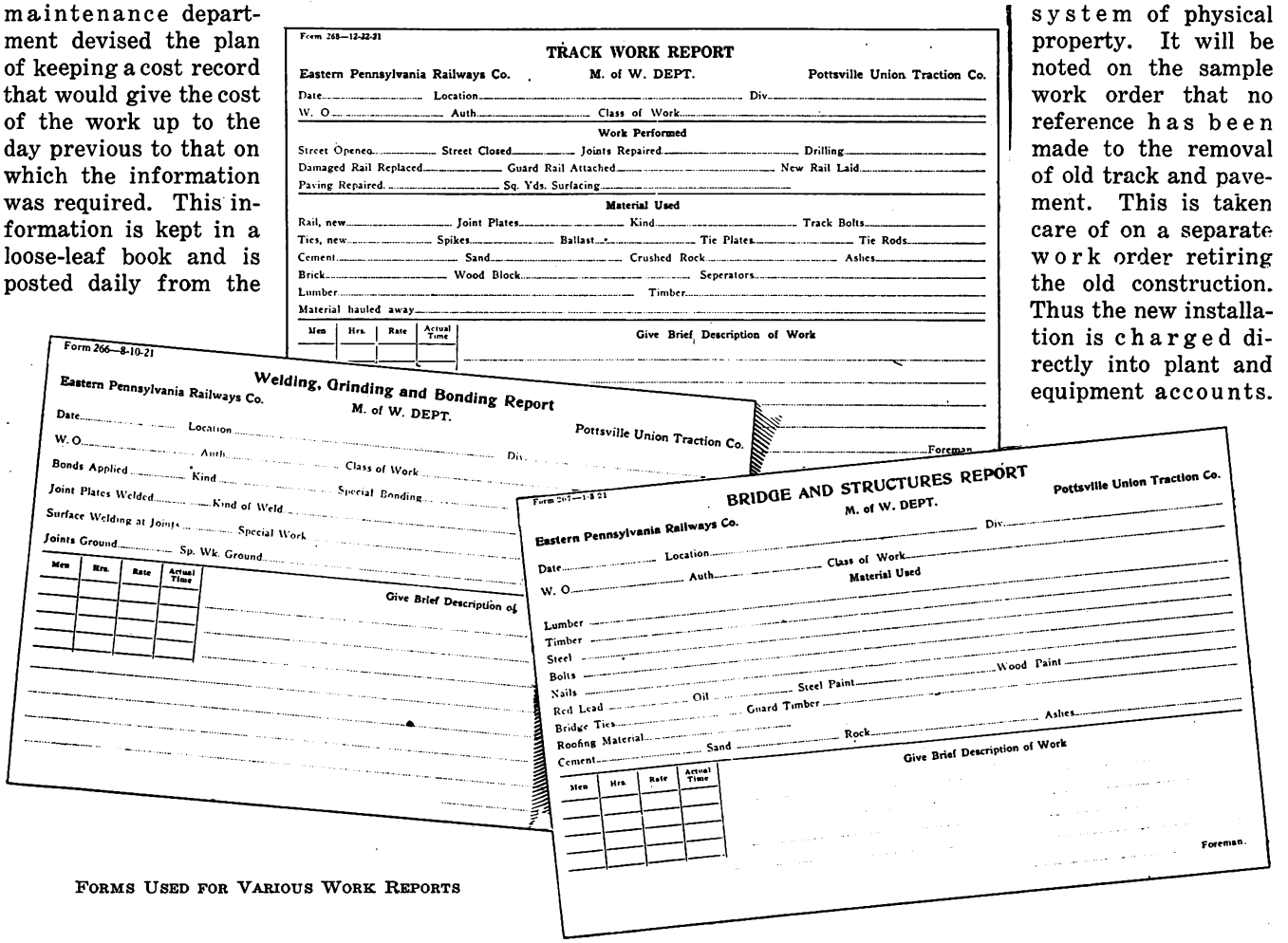
items on the work order consist of the accounts affected by the proposed work, in the system of accounting used on the property. Accounts involving labor charges are subdivided so that the cost of the labor operation may be segregated and analyzed. The timekeeper's report each day carries the work order number with the account number and the subdivision of the account if such is used.

As the information from the accounting department was received too late to be of immediate benefit the maintenance department devised the plan of keeping a cost record that would give the cost of the work up to the day previous to that on which the information was required. This information is kept in a loose-leaf book and is posted daily from the time sheets and from requisitions for material. Not only is the actual expenditure included but the man-hours also. From an estimating standpoint the latter is of more value than the former in so far as the labor items are affected. From these data the average rate may be obtained, and in the event of an increase or decrease in labor costs a percentage may be applied to the average rate and the resulting new rate can then be readily applied to the man-hours so that a new result is obtained.



FORMS USED FOR VARIOUS WORK REPORTS

It has been found of great value to subdivide the items involving labor. It is not enough to know that the cost of track and roadway labor on a certain job was $1.05 per foot of single track. The operation of track laying may be divided into several divisions, all closely related but nevertheless clearly defined, without involving so great detail as to confuse the entire labor account for the job. The first subdivision of track and roadway labor is logically the handling and distribution of materials from the point of storage to the point of use. Track laying and the surfacing of track are two distinct operations, but unless care is used they may be confused in the time report. Joint welding is also a separate consideration. The cost of watchmen and the protection of the public as reflected on the time sheets in the labor cost of temporary crossings, for fire equipment at hydrants, etc., form no inconsiderable item in the cost of track construction in our city streets. Last but not least is the "miscellaneous" subdivision used to cover all of those unexpected expenditures that cannot be estimated by any stretch of the imagination.

Reference has been made to the perpetual inventory system of physical property. It will be noted on the sample work order that no reference has been made to the removal of old track and pavement. This is taken care of on a separate work order retiring the old construction. Thus the new installation is charged directly into plant and equipment accounts. It being quite improbable that in the event of a physical valuation being made at some remote period the book value would be accepted, consequently a careful record is made of all changes to physical property so that should a future valuation become necessary unit prices could be applied to quantities as shown in the perpetual inventory. Work orders are letter size and are filed at the completion of the work, together with the original estimate and supporting data, a complete plan of the work, also sections showing the type of construction, all correspondence, computations relating to paving bills or contract work, copies of all requisitions for material, and at the completion of the work a complete statement from the auditing department of all the expenses entering into the job. With this information available a reconstruction of the work for valuation purposes may be made at any time by applying such unit prices as may be desirable to use.

The use of the various forms also simplifies the clerical work necessary, provides a means for accurate checking of costs when the work is completed and decreases the probability of errors.

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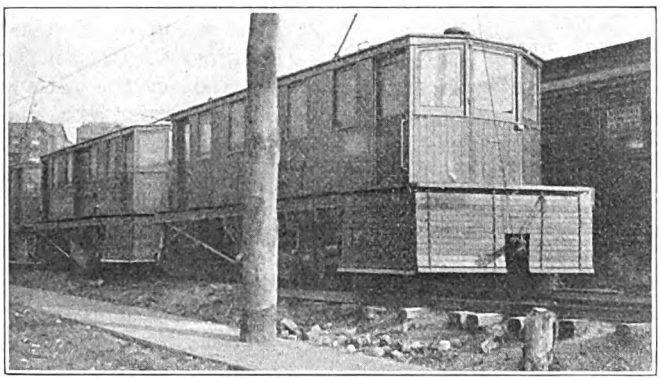
A More Substantial Substitute for Canvas Curtains on Snow Sweepers

MOST snow sweepers are equipped with canvas curtains to prevent the snow from being thrown too great a distance from the tracks. This scheme of restricting the throw of the rotary brushes has not been very satisfactory, however, on the Youngstown (Ohio) Municipal Railway. Hence, A. B. Creelman, master



WOOD SLATS REPLACE CANVAS SNOW PLOW CURTAINS

mechanic, devised the curtains pictured herewith. These consist of four lengths of ordinary fender support chain to which are bolted wood slats. No opportunity has been afforded to give these new curtains a real tryout, but it is believed that they will be much more effective and durable than the canvas curtains displaced.

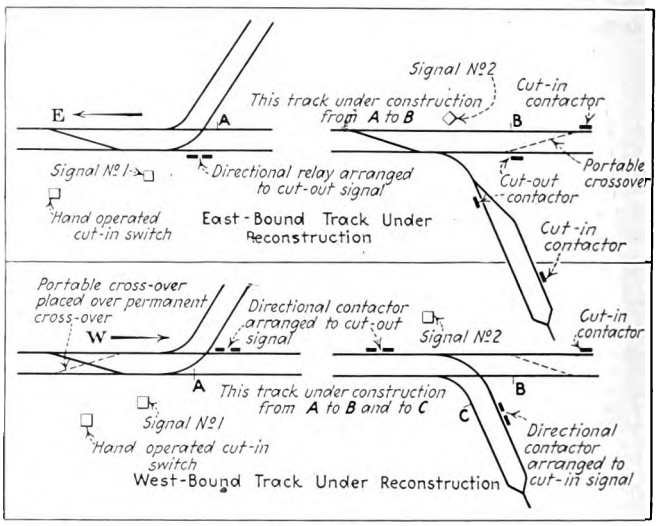
Safety Device for Circular Saws

ACCOMPANYING illustrations show a safety device which has been applied to several of the saw tables in the shops of the Third Avenue Railway, New York, N. Y. This device is the invention of Thomas E. Jenkins, mill foreman for the railway, and its use is proving of particular benefit in reducing accidents.

The device consists of a hinged metal piece which fits into the saw table around the circular saw. This is hinged at one end and in its normal position the end farthest from the hinge projects above the saw table slightly. It is held in its raised position by a small spring which acts on the underside of the guide. When lumber is being sawed the weight of the material forces the device down so that it is flush with the top of the saw table. When the cut has been finished the end of the board slides off the end of the safety device and this rises, so that the material cannot again be drawn back and engage the saw. If the material is drawn back toward the operator it will be forced to the side the distance that this projects out, so that there is no danger of accident. The accompanying drawing and photographs show how the device is installed.

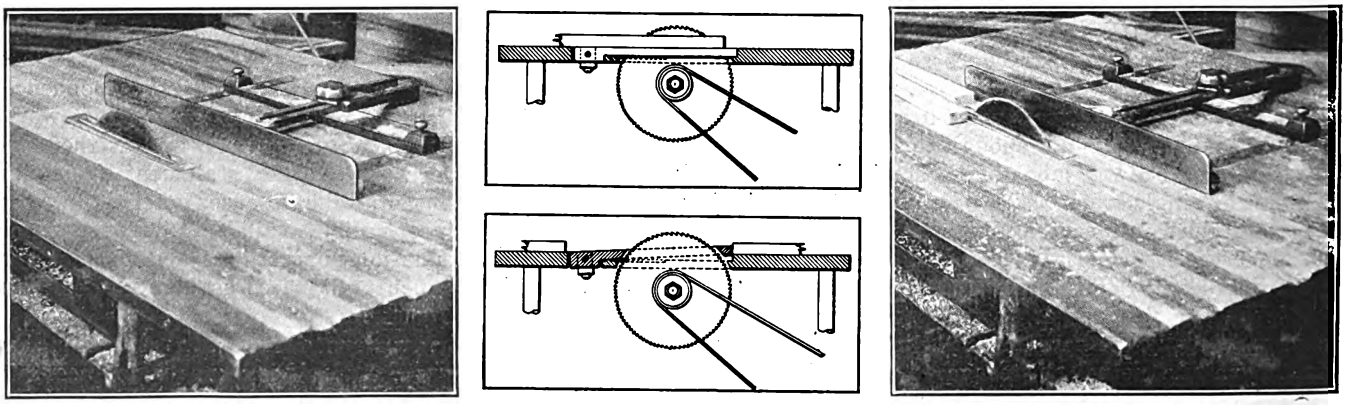
Temporary Signal Installation Saves Flagman During Construction

IN THE reconstruction of track during last summer, the Youngstown Municipal Railway, of which J. B. Stewart, Jr., is general superintendent, found that the single-track operation necessary was greatly expedited and the cost of a flagman eliminated through the temporary installation of Nachod signals. The manner in which the signals were used is shown in the accompanying diagrams. One shows the location of the signals while the eastbound track was under construction and cars were operated in both directions over the westbound track and the other shows the signal installation



DIAGRAMS SHOWING HOW TEMPORARY SIGNAL INSTALLATIONS WERE USED TO PROTECT TRAFFIC DURING TRACK RECONSTRUCTION

for the opposite condition, that is, while the westbound track was under construction. On account of the three lines of traffic, some signaling or flagging protection was absolutely necessary and the automatic signals made a nice economy. The hand-operated cut-in switch shown was used instead of an overhead contactor and operated by a switchman, because it was necessary to have the switchman there anyway to look after the portable crossover and because the electric switch on the branch-off at this point was disconnected and the switchman also handled this.



AT LEFT, VIEW OF SAFETY DEVICE AS INSTALLED IN SAW TABLE. IN CENTER, TOP, VIEW OF SAFETY DEVICE PRESSED DOWN BY MATERIAL. BOTTOM, SAFETY DEVICE IN NORMAL POSITION. AT RIGHT, MATERIAL AFTER BEING SAWED CANNOT BE DRAWN TOWARD THE OPERATOR SO AS TO MAKE CONTACT WITH THE SAW

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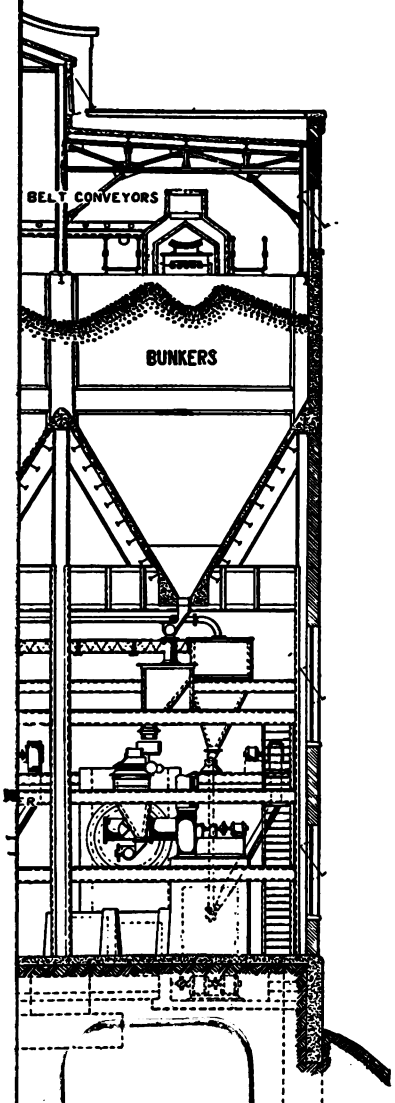

mound in Lake Michigan, the location of the plant in a deep excavation to reduce the lift of circu-

able, a suburban location was considered preferable. After canvassing the district for the most suitable

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At Left, View of Safety Device as Installed in Saw Table. In Center, Top, View of Safety Device Pressed Down by Material. Bottom, Safety Device in Normal Position. At Right, Material After Being Sawed Cannot Be Drawn Toward the Operator so as to Make Contact with the Saw

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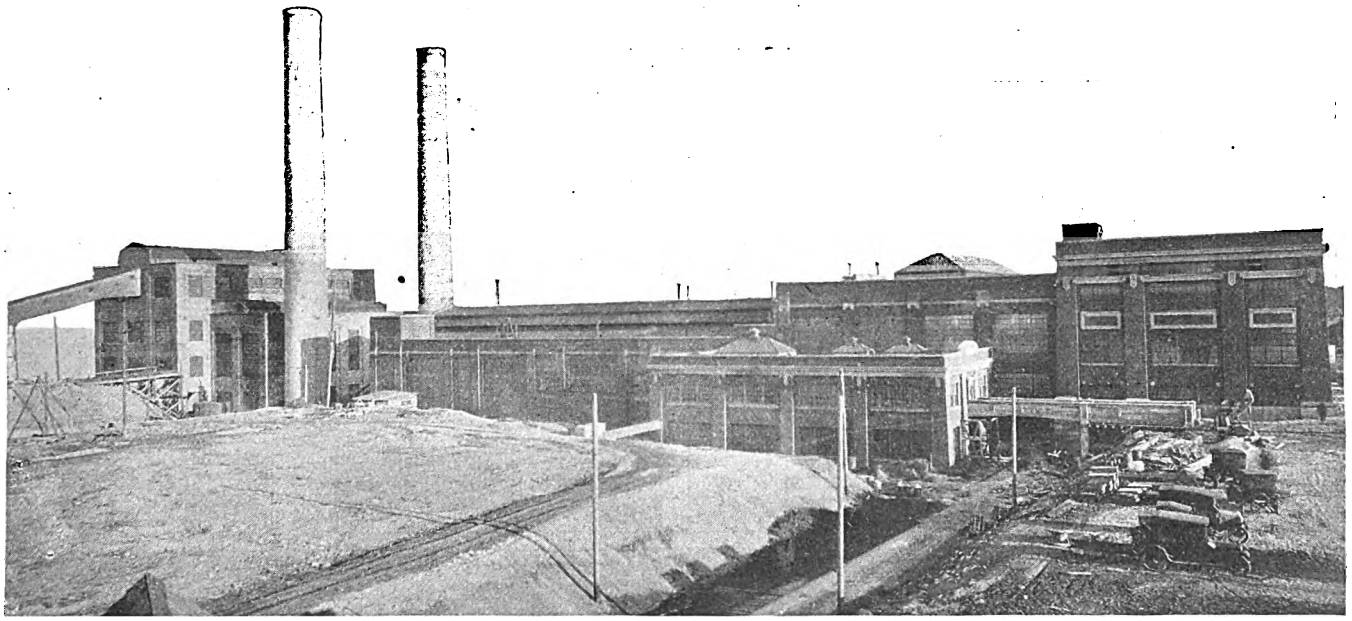

LAKESIDE POWER PLANT, MILWAUKEE. THE COAL PREPARATION BUILDING IS AT THE LEFT

Milwaukee's Powdered Coal Station

First Great Generating Plant Equipped for Burning Pulverized Fuel in Operation for a Year—Station with Ultimate Capacity of 200,000 Kw. Has Many Interesting Features—High Over-All Economy Expected to Be Realized with Use of Low-Grade Coal

OUTSTANDING among many features of the new 200,000-kw. Lakeside generating station of the Milwaukee Electric Railway & Light Company is its design and equipment from the ground up for burning powdered coal. It is the first large railway and central station power plant to be so equipped and therefore marks a development the outcome of which is of greatest interest to large power generation companies generally. The decision to make this largely untried departure from common practice was based primarily on tests made on boilers equipped for burning pulverized fuel at the company's Oneida Street station in Milwaukee. The results of this test, related in ELECTRIC RAILWAY JOURNAL, page 473, Vol. 55, indicated that better efficiency could be expected with pulverized fuel than with stokers, particularly if a plant were built and equipped specifically for this kind of firing.

The new Lakeside power plant has now been in continuous operation since Dec. 15, 1920. Despite the fact that it went into service with a new organization of men largely unacquainted with pulverized-fuel systems, no interruptions attributable to the mechanical equipment have been experienced up to the present time. The company officials feel that the test results so far obtained give promise that the specified thermal efficiency of the station will be reached when the operating and design problems incident to such a radically new system have been mastered. The station economy expected of Lakeside will be that which will result from a combined boiler, furnace, superheater and economizer efficiency of 88.15 per cent, using Illinois coal of approximately 11,000 B.t.u. heat value as received.

Other features of the new Milwaukee power plant are the unique circulating water system and $400,000 rubble mound in Lake Michigan; the location of the plant in a deep excavation to reduce the lift of circulating water with the attendant construction difficulties, and the practical completion of the first section of the station in less than a year. The ultimate development of the plant will reach an hourly capacity of 160,000 kw. with an installed capacity of 200,000 kw., 40,000 kw. being the initial installation and two additional 80,000 kw. sections the future plan. The final boiler capacity will be three times the initial installation and will comprise twenty-four 1,306-hp. boilers.

Work has just recently been started on the installation of an additional turbo-generator unit. This will be of 30,000 kw. capacity, and as it will be run in conjunction with one of the two 20,000-kw. units, no additional boiler capacity is needed for the time being.

The following matter descriptive of the new plant is abstracted from three papers presented before the Technical League of the Milwaukee company by R. H. Pinkley, John Anderson and G. G. Post, respectively engineer of way and structures, chief engineer of power plants and electrical engineer.

Owing to the rapidly increasing demand for electrical energy in the Milwaukee district, the Milwaukee Electric Railway & Light Company found it necessary, in 1915, to begin plans for increasing its power producing capacity. A study made at that time indicated that the best plan would be to construct an entirely new power plant which would provide the necessary increased capacity and would ultimately relieve the existing power plants of the major portion of their load. The general plan was to make provision for a 200,000-kw. plant, building the first section for 40,000 kw. Due to the experience with the old plants located in the heart of the city with an inadequate water supply, restricted coal and ash handling facilities and where smoke is objectionable, a suburban location was considered preferable. After canvassing the district for the most suitable

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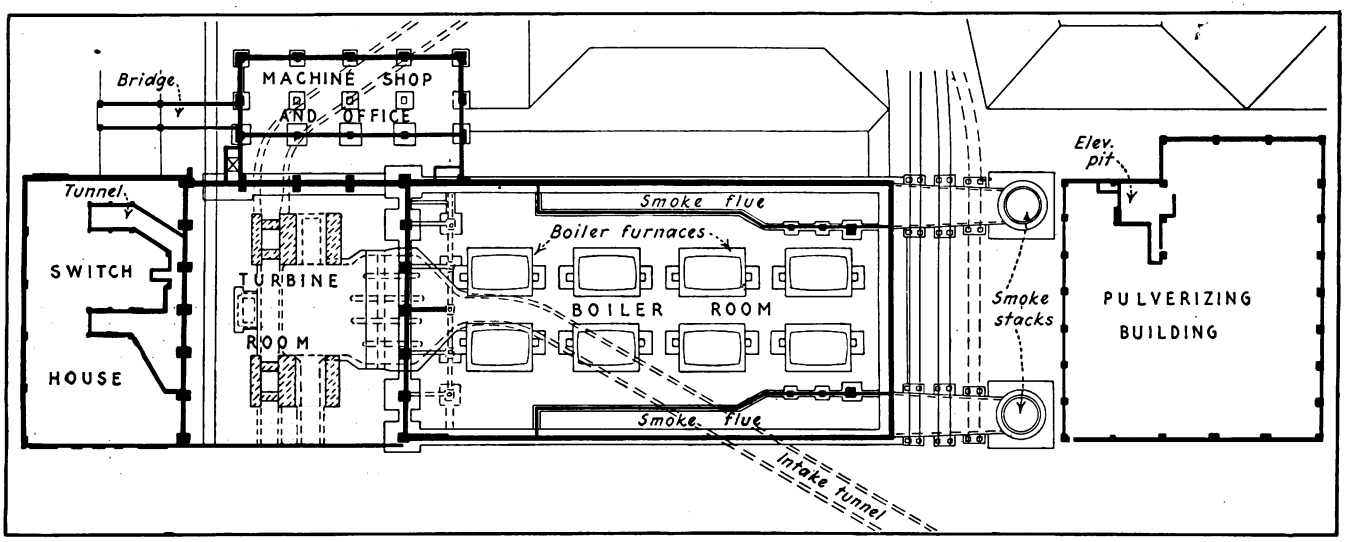
location, the Lakeside site, situated on the shore of Lake Michigan about 1 mile south of the south city limits of Milwaukee, was chosen. This site is not far from the electrical center of gravity of the company's load and is adjacent to the most important industrial centers in the district served.

Accordingly, in 1916, land was purchased, including 6,000 ft. of frontage on Lake Michigan and a railroad right-of-way connecting to the Chicago & Northwestern Railroad. Up to that time coal for power purposes was being received by the company entirely by lake transportation so that coal docks and a protecting harbor were considered essential features of the plant.

Owing to the conditions occasioned by the World War, in 1917 it was found impossible to go ahead with the project. The company set aside all thought of continuing and directed its efforts toward getting the utmost capacity out of every piece of the existing generating equipment. But at the end of 1919 the increased load made it imperative to begin again. Accordingly, on Dec. 22, 1919, orders were issued to proceed with the plans and rush through the construction of the first section of the new plant, including two 20,000-kw. turbine units, so as to have this capacity in readiness, if possible, to deliver power on Nov. 1, 1920. The entire engineering, designing and drafting work was done by the company's own forces and the work was executed under the direction of the company's engineers, the company acting in the capacity of general contractor and sub-contracting the various items of the work.



PLAN OF MAIN BUILDINGS OF POWER PLANT

The power plant proper is made up of three parts—the switchhouse, the turbine room and the boiler room. The switchhouse at the west end is directly joined to the turbine room, but separated by a solid wall except for necessary door openings and a glass panel over the bench board on the second floor. The south wall of the turbine room is a temporary one to be removed when the second unit is added. An auxiliary bay forms the connecting link between the turbine and boiler rooms, separating them to a certain extent but not interfering with the unity of design of the whole structure.

Just north of the turbine room is a two-story structure, 95 ft. x 52 ft., on the lower floor of which is the repair shop, completely equipped to handle work required in maintaining such a plant. On the second floor are the offices of the operating engineer and of the testing department. There is also found there a fine room, 47 ft. x 52 ft., for the use of the Employees' Mutual Benefit Association. To the east of the power plant is the pulverizing plant, 108 ft. x 125 ft., its east end reaching to the edge of the bluff at the Lake Shore. It is equipped to do pulverizing for the entire plant when completed. The stacks rise direct from the ground from a location between the boiler room and the pulverizing plant, each reached from the boiler room through an underground flue 8 ft. x 11 ft. average size. To the north of the pulverizing plant, distant about 400 ft. from it and placed against the side of the bluff to take advantage of the slope to secure a gravity flow for the coal, is the car-dumping and coal-crushing plant, from which the coal is carried by a covered belt conveyor to the pulverizing plant. This also has been planned to meet the requirements of the completed 200,000-kw. plant.

The ultimate 200,000-kw. plant will require water for condensing purposes at a rate of 360,000 gal. per minute or 518,000,000 gal. per twenty-four hours. In order to secure this supply from the lake without going out into deep water, it was decided to build a rubble mound inclosure extending approximately 485 ft. out from the shore and 850 ft. long to provide, in effect, a pond of still and clean water for this purpose. It is the function of the rubble mound to break the force of the waves and prevent rubbish, sand and ice from washing into the intake, thus permitting the intake tunnel to be terminated near the shore line. The discharge tunnel is arranged to discharge either inside or outside of this basin, so that in the winter time the warm discharge water can be used to prevent the basin from freezing. This rubble mound is designed with a height of 8 ft. from the normal surface of the water, with a width of 10 ft. on the top and a slope of 2 to 1 on the lake side and 1½ to 1 on the inner face. As the outer wall is in over 15 ft. of water, the base at the maximum point is 91 ft. wide. The core of this rubble mound consists of quarry run limestone having a minimum size of 3 in.; the cover stones weigh 500 lb. up to 15 tons each. All stone except the inner core are of granite from Wisconsin quarries and are keyed in rubble fashion. There was required in the construction of this rubble mound more than 80,000 tons of stone, the core stone being placed by dumping from

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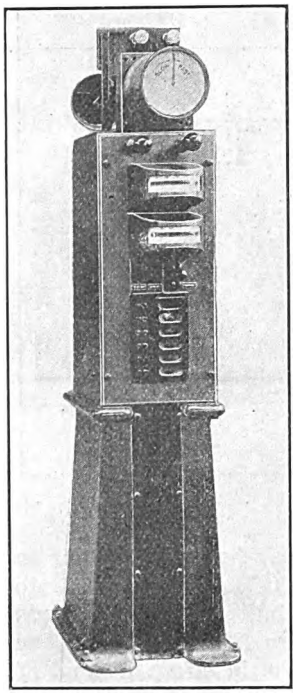
scows and the heavier stone being handled by derricks mounted on barges.

The intake tunnel, which has its top 5 ft. below the water level, is terminated about 50 ft. beyond the water line at the lake shore and a channel was dredged out 15 ft. in depth leading up to this tunnel, which required approximately 7,000 cu.yd. of dredging by dipper dredge. This tunnel is protected at the lake end by a timber ice boom, a submerged sheet pile weir having its top 5 ft. below the surface and a steel bar screen with 6-in. spacing. Inside the plant, the circulating water passes through revolving screens having ½-in. mesh, into a large suction chamber between the foundations of turbines Nos. 1 and 2. Gate houses are provided at the lake termini of both intake and discharge tunnels, so that stop logs can be placed for shutting off the water at these points.

TUNNELS FOR CIRCULATING WATER

Over 1,100 lineal ft. of tunnel and 150 ft. of construction shaft were required for the circulating water system, together with gate houses and a large screen and intake chamber below the condensers and pumps in the turbine room. This location of the traveling screens was decided upon because it saved excavation, permitted the use of overhead crane for lifting the screens for inspection or repair, and gave better operating supervision than if located at the tunnel mouth. As stated above, these tunnels have 10 ft. inside diameter and have a minimum thickness of concrete lining of 12 in. and an average thickness of 18 in.



SIGNALING AND SYNCHRONIZING PANEL FOR EACH MAIN GENERATOR

At the site of the plant, the general level of the ground averages about 50 ft. above the lake level, with a steep bluff at the lake shore. It was desired to provide a suction chamber at the lake level, and to place the condensers at such a level that the water could be circulated through them with a minimum lift, as otherwise an enormous amount of energy would be expended in raising the large quantity of water required for condensing purposes. This necessitated placing the condensers at a low level, which, in turn, determined the level for the turbines and boilers. The deepest excavation required was to an elevation 20 ft. below lake level for turbine foundations and intake chamber, placing the main condenser floor at elevation plus 1 and the main boiler room and turbine floor at elevation 32 or about 18 ft. below the ground level.

These requirements, together with the inclined cuts for railroad tracks, necessitated excavating approximately 131,000 cu.yd. of soil from a pit having a maximum depth of 70 ft. below the surface of the ground, resulting in an exceedingly difficult grading job.

The main smoke flues leading from the boilers to the smokestacks are in the form of concrete boxes approximately 8 ft. high and 11 ft. to 18 ft. wide. Two reinforced concrete smokestacks were constructed, having a height above foundations of 220 ft., inside diameter at top 15 ft. and bottom 16 ft. 6 in. These smokestacks were lined with a 4-in. concrete lining for a height of 60 ft. The main shell of the chimney was 5 in. thick at the top and 16 in. thick at the bottom. The concrete foundation for each chimney was 28 ft. square and 5 ft. thick, heavily reinforced. Each of these chimneys was constructed in about sixty-four days.

The construction of the main buildings involved the use of about 2,250 tons of structural steel, a part of this being in the form of steel plate coal bunkers, steel supports for machinery, galleries and stair work. In the pulverizing building, the steel frame was designed for supporting overhead coal bunkers having a capacity of 3,500 tons.

The coal dumping and crushing plant presented peculiar construction difficulties, being located on the slope of the bluff at the lake shore. The coal cars are brought in to the dumper on the high level at elevation 56. The crushing building is surrounded on three sides by high retaining walls, the west wall of the building forming a retaining wall nearly 50 ft. high and the two end walls being braced to the building floors by means of concrete struts, thereby greatly reducing the spans for the concrete and the materials required for the walls.

The quantities of principal parts of the work performed and materials used may be summarized as follows:

Cubic yards of rough excavation	131,895
Cubic yards of finish excavation	18,500
Miles of railroad track laid	5.5
Tons of stone placed in rubble mound	80,294
Cubic yards of concrete	25,000
Tons of reinforcing steel	1,250
Bags of cement	155,000
Feet of lumber	2,326,000
Number of brick	1,445,000
Tons of structural steel	2,237
Lineal feet of 10-ft. tunnel	1,145

MECHANICAL EQUIPMENT OF LAKESIDE POWER PLANT

The main units at Lakeside station consist of two 20,000-kw. turbo-generators, 13,200-volts, three-phase, 60-cycle, operating on 250 lb. steam pressure, 200 deg. F. superheat, with 1 in. absolute back pressure. The auxiliaries for each unit comprise one 35,000-sq.ft. three-pass condenser; one 24-in. 18,000-gal.-per-minute circulating water pump driven by 170-hp. motor; one 24-in. 18,000-gal.-per-minute circulating water pump driven by 170-hp. steam turbine; one condensate pump driven by a 50-hp. motor; one turbo-air pump driven by 100-hp. motor; one steam jet air pump, and one air waster.

Each condenser is thus provided with two half-capacity circulating water pumps of 18,000 gal. per minute each, one being motor driven and the other connected to a steam turbine. Both of these pumps will be required during the summer months when the water is warm, but only one will operate during the winter.

An air washer is installed for each generator which draws its supply of air from the main turbine room, eliminating a separate screen house and an air duct to outside the building. Suitable means of admitting air into the turbine room from the outside during the cold weather has been made in the monitors on the roof, while during the milder weather it is admitted through ventilators in windows. The generators discharge the air into the basement of the boiler room through sheet metal ducts, thereby using the heated air to augment the regular supply to the boiler furnaces. Provision was

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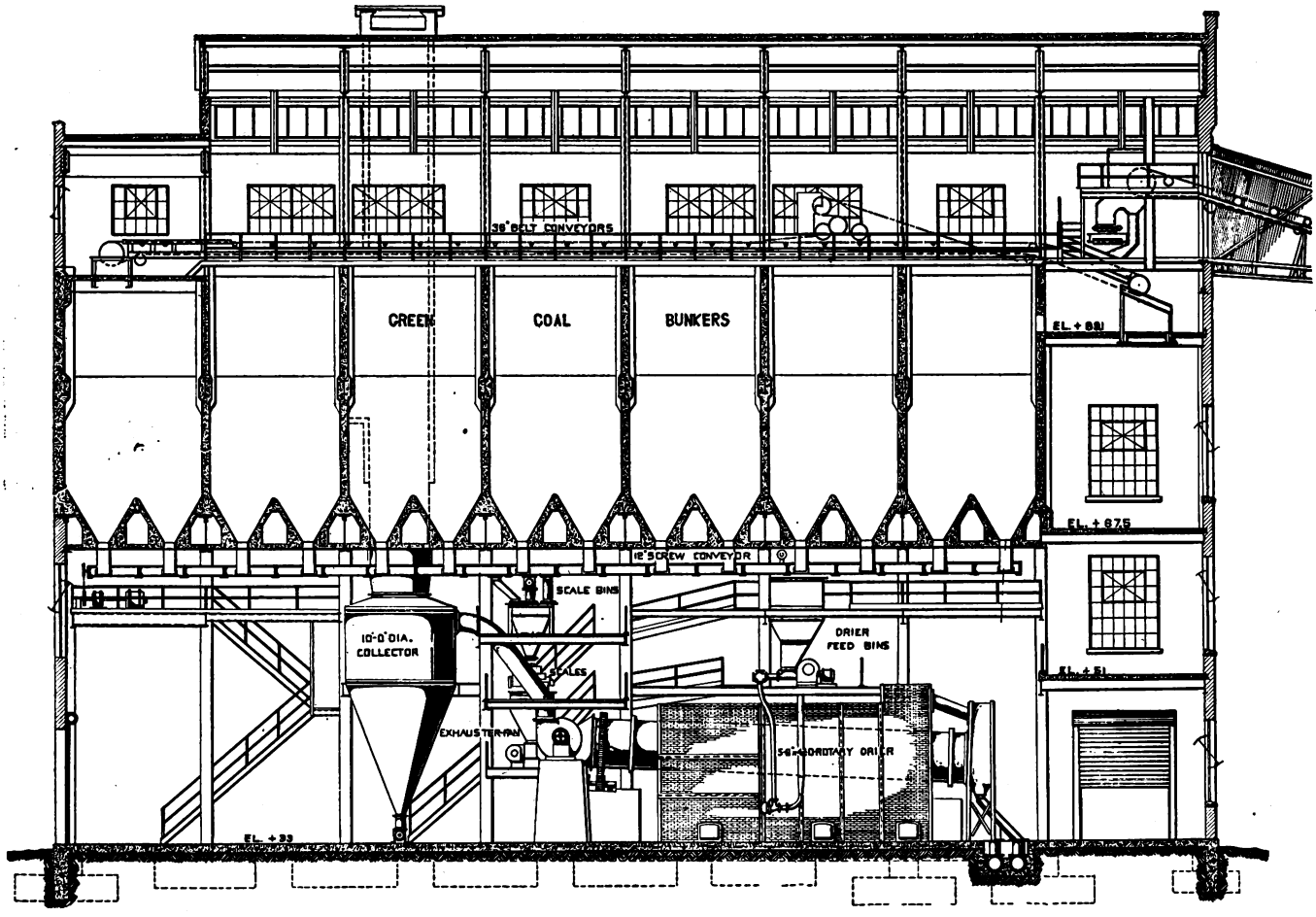
made in these discharge ducts to by-pass a sufficient amount of air back into the turbine room during cold weather so as to temper the air and reduce the openings of the ventilators to a point that will give a proper turbine room temperature. This design of air ducts for generator cooling gives the best results with least investment cost, and also provides for noise reduction.

Automatic dampers have been installed in both the air intake and discharge ducts as close to the generator as possible as a means of fire protection. These close when an unusually high temperature is attained, such as might be occasioned by fire. Arrangement will also be made for admitting carbon tetrachloride, or other fire extinguishing liquid. The station is equipped with the

Each boiler is fitted with a Foster superheater, having a capacity to increase the temperature of 90,100 lb. of steam per hour from 411 deg. F. to 611 deg. F., thus realizing a superheat of 200 deg.

The boiler furnaces are arranged for burning pulverized fuel, which is fed into them by screw feeders from pulverized fuel storage bins overhead. Six out of the eight boilers are equipped with the Lopulco system, that being the design which was tested out in Oneida Street and found satisfactory. Two boilers were fitted with the Fuller system for experimental purposes.

There are installed eight Sturtevant economizers of 7,603 sq.ft. heating surface, one for each boiler, arranged with by-pass connection to the stack for flue



LONGITUDINAL SECTION THROUGH PULVERIZING PLANT

necessary pumps for sanitary service, which pumps are so connected as to be available for reserve feed tank service. An air compressor for cleaning generators and other electrical equipment, operating pneumatic tools, boiler tube cleaners and general service also forms part of the station equipment.

INITIAL BOILER ROOM EQUIPMENT

There were installed eight 1,306-hp. Edge Moor boilers, designed for 300 lb. pressure. The boilers are arranged four in each of two rows. They operate normally at 200 per cent of rating. At this rating three boilers are sufficient to furnish steam for one 20,000-kw. turbine, leaving two spare boilers to allow for cleaning and maintenance. This number of boilers will also be necessary in order to furnish steam in the future for the larger generating units which are expected to be installed in the next section built.

gases. Each economizer is equipped with an induced draft fan driven by a steam turbine. The economizer receives the feed water at 140 deg. F. temperature and raises it to 255 deg. F.

The condensate from the condensers on the large turbines is pumped to an overhead hot well tank, the water from which feeds by gravity to two Hoppes heaters, maintaining a fairly constant pressure on the supply pipe thereto. The heaters raise the temperature of the feed water from approximately 80 deg. to 140 deg. F. The overhead hot well tank is equipped with an overflow to a reserve feed water basin located below the basement floor of the boiler room. The water is reclaimed from this basin by means of centrifugal pumps and is delivered to the overhead hot well tank as needed. From the heaters the feed water passes by gravity through an 800,000 lb. per hour "V" notch feed water meter of extra storage capacity. This meter is located

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on the floor above the feed pumps and gives a 15 ft. suction head on the pumps.

There is also installed a common test line with connections from condensate pumps on each condenser which discharges into a test meter of the "V" notch type of 300,000 lb. per hour capacity, from which it flows by gravity into the heaters. The test meter is located on the floor level with the overhead hot well tank.

The feed water pumps installed consist of two 6-in. centrifugal 650-gal.-per-minute feed pumps driven by 250-hp. steam turbines and two 4-in. centrifugal 400-gal.-per-minute feed pumps driven by 150-hp. motors. The maximum quantity of feed water required for eight boilers operating at 200 per cent rating is 1,254 gal. per minute. This leaves two motor-driven pumps or one steam-driven pump as spare. These pumps are located on the boiler operating floor level at the west end of the boiler room.

As the quantity of ash from pulverized fuel furnaces is very small and very fine it is easily conveyed by means of steam jet ash conveyors. A system of steam jet conveyors is installed with main runs leading to furnace ash pits and branches leading to combustion chambers at the rear of boilers and soot pits under the economizers. This conveyor discharges into an ash bunker which spouts into cars on the railroad track at the east end of boiler room.

Plant for Preparing Coal

The coal bunker is located in the pulverizing plant and has a storage capacity of 3,400 tons, which is slightly more than three and one-half days supply for maximum operation of all boilers in this section. The coal is taken from this bunker by means of three screw conveyors, which convey it to automatic weighing scales. From the scales it is taken by another set of screw conveyors and fed into the dryers. With this arrangement it is possible to take coal from any point in the bunker and deliver it to any one of three dryers. It also allows the coal to be weighed just before reaching the dryers, which is much to be preferred over the method of measuring coal as it enters the coal bunkers inasmuch as it permits of a close daily check on coal consumed in the plant.

Three dryers capable of reducing the moisture content in the coal from 10 per cent to 1 per cent have a capacity of 17½ tons per hour each. From the dryers the coal is discharged into screw conveyors, which convey it to bucket elevators, which in turn deliver it to other screw conveyors to be transferred to dried coal bins over the pulverizing mills.

Eight mills each having a capacity of six tons per hour pulverize the coal so that 85 per cent will pass through a 200-mesh screen and 95 per cent through a 100-mesh screen. The mills are each direct connected to a 100-hp. motor. Each mill is also provided with a fan for separating the pulverized particles which have been reduced to the necessary fineness, discharging them into cyclone separators overhead, where the fuel is separated from the air and falls by gravity into a screw conveyor located at the base of the separators. This conveys it to the pulverized fuel bins. From these bins it is conveyed to fuel bins in the boiler room by means of the Fuller-Kinyon system of transporting pulverized material.

Coal is removed from cars by means of a rotary car dumper of the Robins-Scherzer type and dropped into a track hopper fitted with bottom shaker feeders. Belt conveyors carry the coal from the track hopper over a magnetic pulley for the removal of such iron as may be in the coal. It is then passed through a two-roll crusher and hammer mill, where it is reduced to ½ in. size. It next discharges directly onto an inclined belt, which carries it to the distributing belts over the coal bunker in the pulverizing plant. There are three such distributing belts over the bunker, each having a traveling tripper which discharges coal at any point along the length of the belt.

The crusher and hammer mill have a capacity of 150 tons of mine run coal per hour. The conveyors are 36-in. belts, having a capacity of 250 tons per hour at 250 ft. per minute. Provisions have been made for the installation of another crusher unit which will double the capacity when required in the future. Provision has also been made for the future storing of rail coal on the dock by means of by-passing the crusher and conveying the coal by belt to the dock, where it will be taken up by coal bridge and stored. Coal from the dock will be reclaimed by reversing the operation and delivering coal reclaimed into crushers. Lake coal will be taken into the plant in the same way.

Method of Maintaining Heat Balance

It was decided in order to obtain a well-balanced heat condition for use in connection with heating feed water to a suitable and regular temperature before introducing it to the economizer to install steam drive for boiler feed pumps, induced draft fans and half of circulating pump capacity, leaving the balance of steam required for heating feed water to be supplied in varying quantities by the house unit, or so-called heat balancer. All other auxiliaries are direct motor driven.

Electrical Features of New Power Plant

Current at the Lakeside plant is generated at 13,200 volts and all outgoing high-tension lines operate at 13,200 volts and leave the station underground. Many of the lines have been connected to the Commerce Street power plant and other stations in Milwaukee, but others will be connected to an outdoor transformer station near at hand, which will step the pressure up to 26,400 volts for transmission to distances in general exceeding 6 miles. It is possible that at a later date some energy will be stepped up to 66,000 volts or more for transmission to remote points.

The generators in the initial installation are General Electric Company, 20,000-kw., 0.8-power factor, three-phase, 13,200-volt, 60-cycle, 1,800-r.p.m. machines. Excitation for the generators is furnished at 240 volts and is normally supplied for each generator by its own direct-connected exciter. Emergency excitation is furnished from the d.c. station power service. The oil switch control system is 120 volts d.c., regularly supplied from a separate storage battery and special motor-generator sets. If necessary the oil switch control may be transferred immediately to the battery on the d.c. station power system by connecting it across one-half of the cells.

The 13,200-volt main connections and circuit breakers are located exclusively in the switch house. There are two main bus bars with sectionalizing switches between generator sections. Possible future sectionalizing reactors will be installed. To promote safety and prevent electrical trouble from spreading, all 13,200-volt bare copper and cables are taped with approximately ¼ in. of varnished cambric and covered with a layer of

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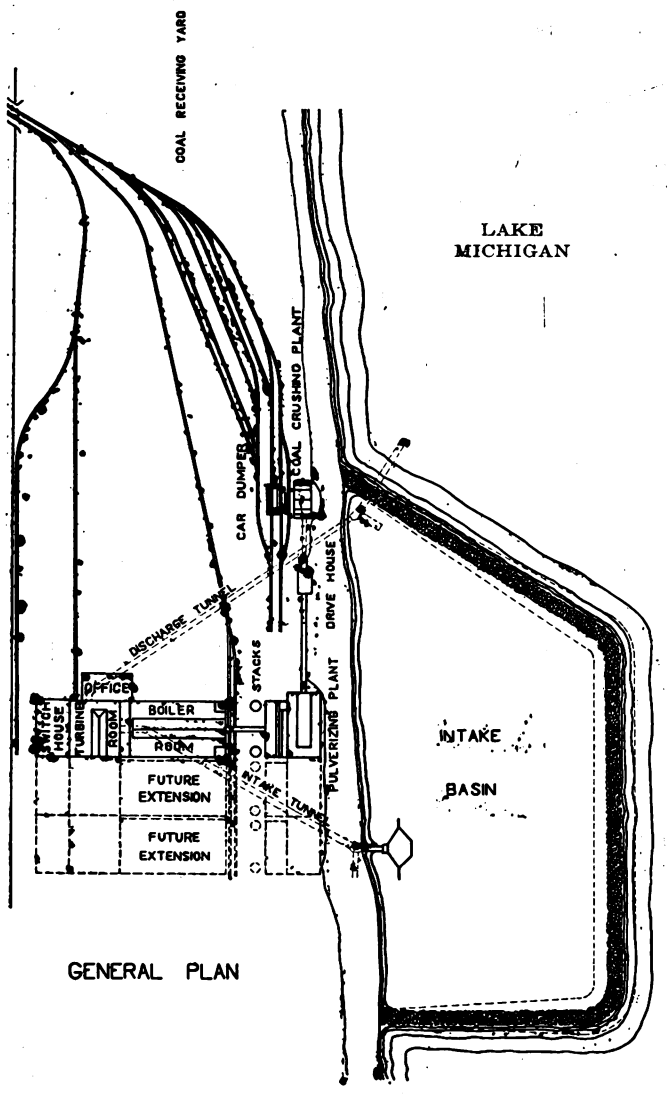
cotton tape impregnated with a fire-resisting substance. Each generator may be connected to either main bus through selector oil circuit breakers. Feeders are connected in groups of three to feeder group bus bars, which in turn may be connected to the main bus bars through group circuit breakers.

The arrangement of equipment in the switch provides for reliability of operation. Some of the features of the arrangement of apparatus are these: The main circuit breakers of different generators are separated a considerable distance from one another with from three to



GENERAL LAYOUT OF LAKESIDE POWER STATION FACILITIES

four groups of feeder breakers between them. Because of this it will be difficult for trouble on one set of generator breakers to be communicated to the breakers of other generators. The group breakers of any one feeder group are located as far as possible from one another, one being at one end and the other at the opposite end of the feeder section. This makes it unlikely that trouble in one group breaker will involve the other group breaker on the same feeder group.

Oil circuit breaker mechanisms are located on the fourth floor, oil circuit breakers on the third floor, main bus bars, potential transformers, feeder current transformers, feeder reactors and feeder group bus bars on the second floor, and generator current transformers, lightning arresters, feeder potheads and disconnecting switches on the first floor. The generator leads pass in a nearly horizontal direction from the generator foundation through a tunnel underneath the switch house and then rise vertically to the generator selector bus on the second floor. The generator leads each consist of two 1,000,000 circ.mil, single-conductor, stranded copper cables insulated with $\frac{7}{16}$-in. cambric and covered with a flame-proof braid. Although these cables are in a dry place and insulated for the operating voltage they are nevertheless supported clear of everything on porcelain bus bar supports spaced approximately 3 ft. apart. Cables are continuous without joints from the generator to the current transformer on the first floor. From the current transformers to the main circuit breakers the leads consist of two $\frac{1}{4}$-in. x 3-in. copper bars. The main generator oil circuit breakers are General Electric type H-6, rated at 2,000 amp., 15,000 volts and capable of rupturing 18,000 amp. at the rated voltage. Each pole of these breakers is located in an entirely separate compartment and the crossheads are in another separate compartment underneath the operating mechanism on the fourth floor. The main bus bars on either side of the room consist of two or more $\frac{1}{4}$-in. x 4-in. copper bars suspended from the ceiling on substantial porcelain insulators and separated from one another by gypsum barriers 2 in. thick. The main bus bars are on opposite sides of the room, making it practically impossible for trouble on one set of bus bars to involve the other.

The feeder group bus is connected between the group oil circuit breakers, one of which is directly over the west main bus and the other over the east main bus. Feeders are tapped off between the group circuit breakers. Conductors run from the feeder bus through porcelain bushings in the wall, thence upward to the feeder oil circuit breaker and down through current transformers and feeder reactors to disconnecting switches and cable terminals. Group oil circuit breakers are of the same type as the main generator bus bar, but rated 800 amp. and having a rupturing capacity of 18,000 amp. The crossheads, as in the case of the generator breakers, are located in a separate compartment underneath the operating mechanism on the fourth floor. Feeder breakers are General Electric type H-3, rated 300 and 500 amp., depending upon the size of feeders connected, and will rupture 10,000 amp. at 15,000 volts.

STATION SERVICE POWER

On account of the fact that some of the motor-driven plant equipment, such as that for coal crushing and pulverizing, is located a considerable distance from the source of supply, it was decided that such auxiliaries should operate at 480 volts. It was further decided that some d.c. auxiliary service should be furnished on account of the turbine room crane, motor-operated steam valves, car dumper, magnetic pulley and certain operations requiring variable speed. To make this service available as an emergency source of excitation, 240 volts was selected. To simplify the station power service, the control of main emergency auxiliary feeders was placed under the control of the switch house operator, who handles this system exactly as a substation supplying a group of customers. For the purpose of adding to the safety of workmen, safety switches have been adopted for use at the various motors. All bare copper bus bars, cable and wire are insulated adequately to safeguard the service.

Service for a.c. auxiliaries is furnished by two 3,000-kva., 13,800-13,200-volt primary, 480-volt secondary, 60-

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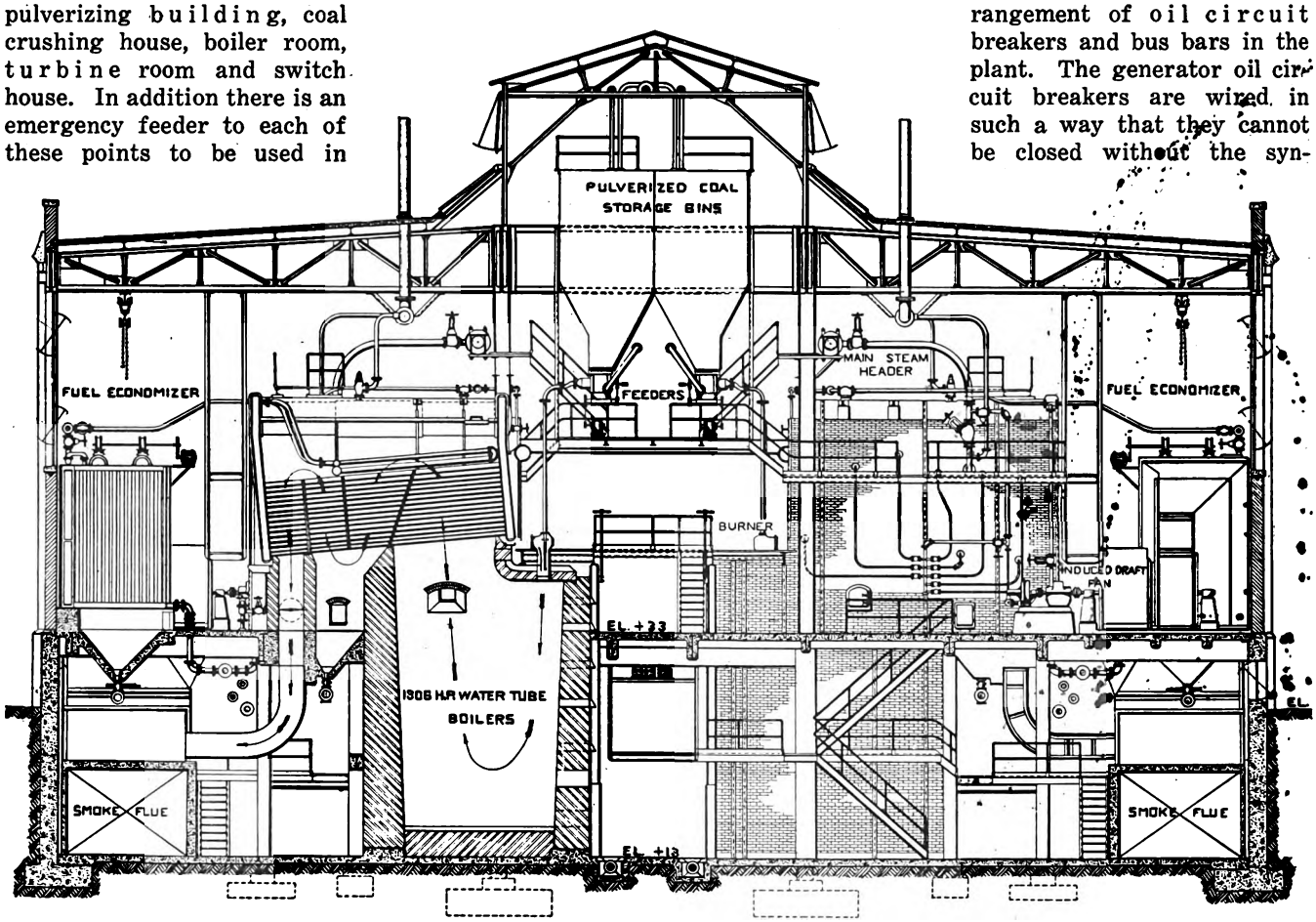
cycle, three-phase, water-cooled transformers, one serving as a reserve for the other. These transformers are located in the turbine room basement underneath the mezzanine floor on which the generator field and exciter rheostats, neutral oil circuit breakers and other electrical auxiliaries are located. Located as they are, the 13,200-volt cables supplying them are short and do not pass through any part of the plant where they may be subjected to too much heat and consequent liability of trouble. Bus bars, transformer circuit breakers and oil circuit breakers on feeders to distribution points throughout the plant are all in duplicate. There is one main feeder to each main division of the plant, such as pulverizing building, coal crushing house, boiler room, turbine room and switch house. In addition there is an emergency feeder to each of these points to be used in case of trouble on the main feeders. The auxiliary bus bars consist of ¼-in. x 4-in. copper bars supported on substantial porcelain insulators in horizontal compartments above the oil circuit breakers on the auxiliary feeders. Large air brake circuit breakers are used instead of oil circuit breakers on the secondary side of the auxiliary transformers. These breakers are provided with reverse power relays so that with both transformers in operation trouble in a transformer or on its primary breaker will cause the proper breakers to open, thereby clearing the trouble without interfering with the service. Station distribution switchboards, located in various parts of the plant, are constructed in such a manner as to make it possible to kill half of them for work to be done without interfering with service on the other half.

The general arrangement of the d.c. auxiliary supply is similar to that of the a.c. This system is supplied by two 300-kw. motor-generator sets, one serving as reserve for the other and each consisting of a 480-volt, 60-cycle, squirrel cage induction motor, direct connected to a 250-volt d.c., 1,200-r.p.m. shunt wound generator. These sets are supplied from the 480-volt a.c. station power system. To guard against a shut down, a 150-cell G-15 battery in G-23 tanks is kept floating across the 240-volt bus. The main d.c. busbars and switches are located on a switchboard in the operating room. Each main feeder is provided with an ITE circuit breaker and at the various distribution panels and cabinets in the plant fuses are provided on branch circuits.

The main station wiring is represented by mimic busbars on the bench sections and the arrangement of control switches is such as to conform exactly with the arrangement of oil circuit breakers and bus bars in the plant. The generator oil circuit breakers are wired in such a way that they cannot be closed without the synchronizing plug being in its receptacle. The same is true of feeder oil circuit breakers. The signaling equipment on the bench board is exactly the same as that on the instrument panel at the turbine throttle. Since the switchboard operator is in an entirely different room from the steam engineer, it is necessary for them to make use of signals in bringing machines up to speed and cutting them in or out.



CROSS-SECTIONAL VIEW OF THE BOILER PLANT

There are three feeders per panel, each panel corresponding to a feeder group. The equipment per feeder on each panel consists of three ammeters, one voltage indicating lamp, one synchronizing receptacle, one pull button control switch with red and green indicating lamps and three overload induction relays with test links.

To make it possible to communicate with all parts of the plant at any time of the day or night with the minimum of operating expense, an automatic telephone system has been installed. The exchange controls twenty-five circuits with an ultimate capacity for 50.

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Letters to the Editors

The Trolley Shoe or "Slide" at Low Speed

LEAGUE CITY, TEX., April 8, 1922.

To the Editors:

I have read considerable discussion on the merits of the sliding contact shoe as against the standard trolley wheel, but there is one feature of the case as I have experienced it that has never been touched upon in anything I have read or heard. This is the unusually great wear on the trolley wire by the sliding shoe at slow speeds. And while this might not be a deciding factor on high speed roads it would have a bearing in selecting a current collector for city cars, which of necessity must run slowly in the downtown sections, or for interurbans, which use city lines for entering the city.

My experience has been exclusively on high-speed interurban trolley,* and about three years experience proves conclusively that the wear on the trolley wire is very much greater at slow speed with the slide than with the wheel. And it would seem that the extra wear is due almost entirely to increased friction at slow speed. This is proved by tests which I have made.

For a period of about seven years we used wheels, and micrometer measurements of the trolley wire wear at intervals revealed no noticeable difference in the wear at points of high and slow speed, but after adopting the contact slide this became very noticeable without measurements. This extra wear was so great that in less than three years it was necessary to renew the wire at points where frequent stops were made, as in front of stations. And the first places to be renewed were those of most frequent stops. It has been suggested that the increased wear might be due to increased current draft in starting, but this is disproved by the fact that increased current draft with the wheels showed no difference in wear.

Another proof that it is increased friction is the fact that at high-speed points the wire takes on a gloss on the underside when the slide is used while the gloss is entirely absent where the speed is slow, indicating that the wire is being cut away with every passing trolley. The distance of increased wear is not very great, however, it being necessary to renew but little more than 150 ft. of trolley wire at each place renewed. This is due to the rapid acceleration of the trains in starting. I have also noticed that the slide is more destructive of trolley wire fittings—as splicing sleeves, section insulators, frogs and crossovers—than the wheel. This is due to the fact that a smooth under-run is never secured on these devices, and a hammer blow results with the passing of every slide, which forms a "shoulder" which is aggravated with each blow struck. The wheel *rolls* upon this uneven place with the result that the wear is not so great. This hammer blow tends also toward crystallization of the wire, making breaks at the entrance of the wire more liable. The tendency to run the slides after they are badly worn also is destructive to fittings, more so than the wheel, due to the fact that the slide takes on a more restricted groove than the wheel. After passing the end of a fitting the shoe has an upward thrust, and the resulting blow may tend to crystallize the wire.

This is not to be construed as being written in condemnation of the sliding contact, but only to point out certain results which may be expected from its use, results which I have never heard mentioned in discussions. My experience is that the slide stays on the wire better than the wheel, has much less arcing and pitting of the wire, and except in the faults mentioned is superior to the wheel. But in using it, it is well to pay special attention to fittings and points of slow speed, putting secure anchorage for the trolley wire on each side of such places, to catch breaks which may occur.

C. L. GREER.

*The Galveston-Houston (Texas) Electric Railway.

What the Committee on Welded Rail Joints Is Doing

BROOKLYN RAPID TRANSIT COMPANY
BROOKLYN, N. Y., April 11, 1922.

To the Editors:

The committee on welded rail joints has been making considerable progress in its preliminary work and it seems advisable to make a statement concerning its organization and the nature of the work so far accomplished. While the work, from its very nature, must be somewhat slow it will be realized by those who have tried to answer the questions in the four sets of data sheets recently sent out that the task of preparing them was no small one. It is quite certain that from this time forward the work will proceed faster because the committee is now in possession of enough preliminary data to permit the assignment of the various subjects requiring special research to definite sub-committees. It is now expected that a meeting of the general committee will be called early in May.

The American Electric Railway Engineering Association, through its 1921 committee on way matters, initiated the formation of a special committee on welded rail joints for the purpose of having an authoritative investigation made of the various types of welded rail joints now in commercial use. The American Bureau of Welding, as the co-ordinating agency in the general field of welding research and standardization, undertook to organize the committee.

Welding in one form or another is being widely used in making joints in street railway rails, but more or less trouble has been experienced in all types of welded joints from breakage. Very few scientific data exist as to the correct procedure to be followed in making the welds by the several processes. Several of the larger electric railway companies are spending many thousands of dollars yearly on such joints. Much of this expense is being made without a sufficient knowledge of the underlying principles involved.

A preliminary organization meeting of the committee on welded rail joints was held in June, 1921, at the office of the American Welding Bureau in New York City. At that meeting a plan of organization was prepared and the method of conducting the work outlined. A relatively large committee has since been organized, including representatives of users, consumers and the best technical experts in the field. For the purpose of directing the work during the formulative period the following were asked by the Welding Bureau to serve as an executive committee: Dr. G. K. Burgess, United States Bureau of Standards, chairman; E. M. T. Ryder, way engineer Third Avenue Railway, vice-chairman; C. A. Adams, director American Bureau of Welding;

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H. M. Steward, superintendent of maintenance Boston Elevated Railway, and the writer.

It should also be noted that the Engineering Association has become a member of the American Bureau of Welding, with E. M. T. Ryder as its official representative, in order to further the important work which the bureau is conducting in its direction of the work of the welded rail joint committee.

The members of the general committee are:

F. E. Abbott, consulting inspection engineer Lackawanna Steel Company.
C. A. Adams, Harvard University, director American Bureau of Welding.
E. O. Ackerman, engineer of way Columbus Railway, Power & Light Company.
G. K. Burgess, Bureau of Standards, Washington, D. C.
Alexander Churchward, consulting engineer Wilson Welder & Metals Company.
R. C. Cram, engineer surface roadway Brooklyn Rapid Transit Company.
J. H. Deppeler, chief engineer Metal & Thermit Corporation.
H. M. Gould, City of Detroit Department of Street Railways.
H. F. A. Kleinschmidt, superintendent track welding department Lorain Steel Company.
C. F. Lederer, Metal & Thermit Corporation.
J. C. Lincoln, president Lincoln Electric Company.
E. J. McIlraith, superintendent of way Philadelphia Rapid Transit Company.
J. K. Punderford, vice-president and general manager the Connecticut Company.
E. M. T. Ryder, way engineer Third Avenue Railway System.
William Spraragen, engineering division National Research Council.
W. C. Starkey, chief engineer Ohio Brass Company.
G. Wallace Smith, engineer San Antonio Public Service Company.
H. M. Steward, superintendent of maintenance Boston Elevated Railway.
H. L. Whittemore, Bureau of Standards, Washington, D. C.
G. L. Wilson, engineer maintenance of way Minneapolis Street Railway.
W. W. Wysor, chief engineer United Railways & Electric Company of Baltimore.
F. A. Weymouth, sales metallurgist Bethlehem Steel Company.
G. C. Estill, superintendent way and structures New Orleans Railway & Light Company.
E. Vom Steeg, General Electric Company, New York.
R. H. Dalgleish, chief engineer Capital Traction Company.
H. H. George, engineer maintenance of way Public Service Railway.
John H. Hanna, vice-president Capital Traction Company, Washington, D. C.
C. S. Kimball, engineer way and structures Washington Railway & Electric Company.
E. C. Price, the Indianapolis Switch & Frog Company.
Jonathan Wolfe, assistant superintendent track and roadway Chicago Surface Lines.
H. A. Currie, the New York Central Railroad.
D. D. Ewing, Purdue University.
A. P. Way, American Railways Company.

The general scheme of conducting the work, subject to such changes as may be made at the meeting of the committee, is as follows:

1. Preparation of a bibliography and critical summary of our present knowledge, including the gathering together of all available experience in this field.

2. Consideration of the results of (1) and the laying out of specific experiments to be performed.

3. The assigning of each of these experiments or researches to an appropriate laboratory, or in the case of field experiments to one or more appropriate operating companies. These assignments would, of course, cover the men under whom these specific experiments will be conducted.

So far the work of the committee has been financed principally by the American Bureau of Welding. The committee is without funds and it is hoped that the various railway companies, together with the several manufacturing interests, will contribute toward the expense of the work, either by furnishing test specimens, conducting field tests, laboratory experiments and tests or with direct cash contributions.

R. C. CRAM,
Engineer Surface Roadway.

Motormen Need Knowledge as Well as Good Physique

PORTLAND, ORE., April 8, 1922.

To the Editors:

I read with interest the letter from the Georgia Railway & Power Company, in the April 1 issue of the ELECTRIC RAILWAY JOURNAL, concerning the selection of employees. From the viewpoint of a motorman I heartily agree with the points raised in that letter. If a man has some physical defect he is a dangerous man around any kind of railway.

But there's something else just as important as physical fitness—that is, knowledge. Knowledge as applied to the motorman comprises three things: common sense, judgment and training. Over the first two the employing company has very little control, but over the last it has, and here is where a good many fall down.

Take, for example, two interurban electric roads operating heavy trains. On the first the motormen are required to take rigid air-brake and technical examinations and the discipline is very strict as to operating rules. On the other no examination on air-brakes or other equipment is required and discipline on operating rules is very slack.

Now which of these roads will come out better in the end? I believe the first one, and it is my contention that no electric road, particularly an interurban, can afford to get along without the air-brake examination.

GEORGE W. BOOTH,
Interurban Motorman.

Is Salesmanship in Transportation Possible?

THERE are not a few railway managers who say that salesmanship on the other fellow's property may be all right and possible, but how can it apply to their properties? Salesmanship such as evidenced by the following appears to be possible anyway:

"A traveling business man reports as follows: In . . . , a couple of weeks ago, I was very agreeably impressed by a conductor, who, when I thanked him for information, replied with a smile, 'You're welcome.'

"In . . . (another town) too, they seem to have conductors who take an interest in passengers. One conductor who carried me past my destination, stopped the car, came to me and said, 'I owe you a fare. I have carried you five blocks past your stop.' He then gave me a ticket (good for 8 cents) and told me where to stand to get the return car.

"The conductor on the returning car was a salesman also. I told him where I wanted to get off, describing the location as near a certain factory I desired to reach, and he not only told me where the corner was, but, as I was alighting, told me which way to walk to reach the factory I was looking for.

"I was impressed with the fact that while these were homely acts yet they were acts which evidenced a real instinct toward salesmanship."

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Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

New Double-Truck One-Man Cars in Bangor

Six Light-Weight Cars Embodying All Safety Car Features Have Been Placed in Service by the Bangor Railway & Electric Company

BY HORACE B. BALDWIN
Master Mechanic Bangor Railway & Electric Company, Bangor, Me.

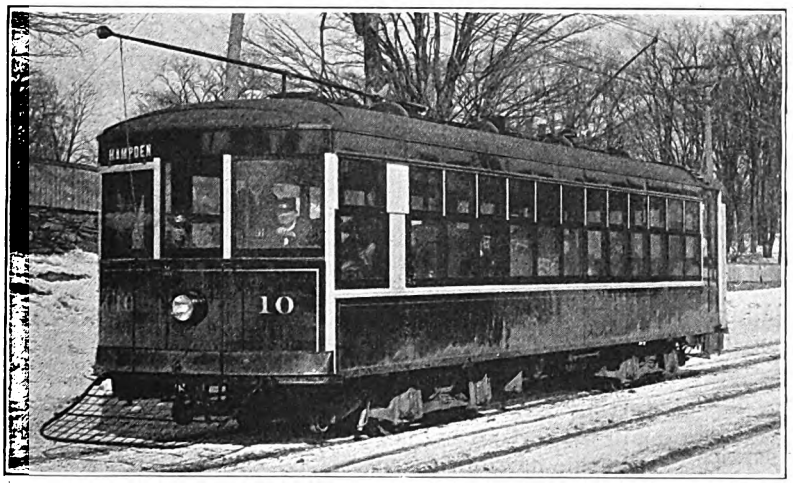
THE Bangor Railway & Electric Company has operated fifteen Birney safety cars equipped with General Electric type-258 motors since October, 1918. This operation has been very successful, but now as it is necessary to purchase new rolling stock the officials have decided to develop a light-weight double-truck car for one or two-man operation. This car can be used on either city or suburban lines, will weigh about 28,000 lb., seat fifty-two passengers and be equipped with four motors of the same type as used under the safety cars. The same general construction and all parts above the underframing will be standard with the Birney cars.

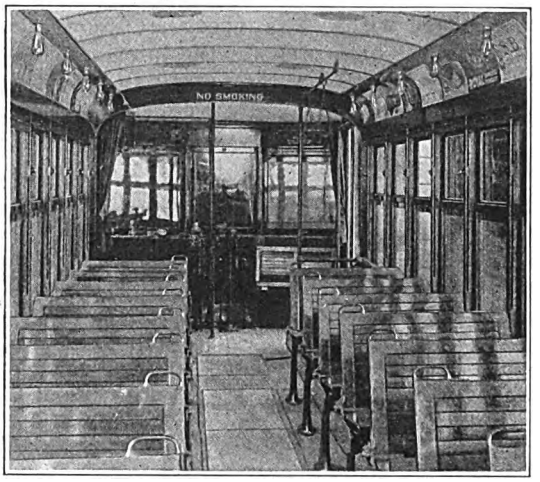
Six of these cars have been built by the Wason Manufacturing Company. The first two cars were put into service on Feb. 10, 1922, on the Bangor and Hampden line and will replace cars weighing 46,000 lb. of the semi-convertible type seating forty-four passengers, and equipped with four 40-hp. motors. During the snowstorm of Feb. 16, 1922, these cars operated very satisfactorily and we had no trouble in making the running time. The company now feels that this type of car will prove as efficient in snow as the heavier type car which it displaced. Some general dimensions of the cars are given in the accompanying table.

These cars have the general appearance of an elongated Birney safety car. The trucks are the Brill 77 E-1, specially designed for low floor, with 26-in. wheels. Other details include A.E.R.E.A—E 2 standard axles, 4 General Electric 258 Form C motors, K 35 HH control, General Electric CP 27 B air compressor, Safety Car Devices Company full safety equipment provided with whistles, Root air-operated snow scrapers, operators 14-in. foot gong, Keystone trolley catchers and Cleveland fare boxes. Two sliding curtains are provided which inclose the end of the car around the operator. Simplex No. 3 trolley bases, Golden Glow type S M 95 headlights and 22 Consolidated Car Heating Company's type 392 cross seat heaters are also used.

SOME DETAILS OF CONSTRUCTION

The body is framed for thirteen windows on each side. The side posts are 1½ in. x $\frac{7}{16}$ in. tees which run in one continuous length from side sill to side sill, and thus form the carlines. The post spacing is 28½ in. center to center except that of the extreme window opposite the door opening, which has a spacing of 38½ in. The side sills are 3 in. x 3 in. x $\frac{3}{8}$ in. angles in one continuous piece from end sill to end sill. The cross sills are 4-in. 5¼ lb. channel, and the bolsters are of the truss type with plates of 8-in. x $\frac{5}{8}$-in. and 8-in. x ¾-in. soft steel. Corner posts are pressed steel. The





EXTERIOR OF NEW LIGHTWEIGHT CAR, AND AT RIGHT VIEW SHOWING INTERIOR AND PLATFORM ARRANGEMENT

GENERAL DIMENSIONS AND WEIGHTS OF CAR

Length over bumpers	40 ft. 3 in.
Length of platform	4 ft. 9 in.
Distance between bolster centers	20 ft. 1 in.
Wheel base of truck	5 ft. 3½ in.
Width over side sheets	8 ft. 0 $\frac{7}{16}$ in.
Width over all	8 ft. 3½ in.
Height, from track to top of roof	10 ft. 1$\frac{13}{16}$ in.
Height from track to sill	2 ft. 2½ in.
Height from track to top of floor	2 ft. 8 $\frac{7}{16}$ in.
Height from track to step	16 in.
Height from step to platform	15½ in.
Width over side sheets	8 ft. 0 $\frac{3}{16}$ in.
Width over all	8 ft. 2$\frac{7}{8}$ in.
Width of door opening	2 ft. 8½ in.
Width of aisle	2 ft. 0½ in.
Side post spacing	2 ft. 4½ in.
Weight of car body with air brake and control equipment	15,110 lb.
Weight of trucks	9,100 lb.
Weight of four G. E.-258 Form C Motors	4,450 lb.

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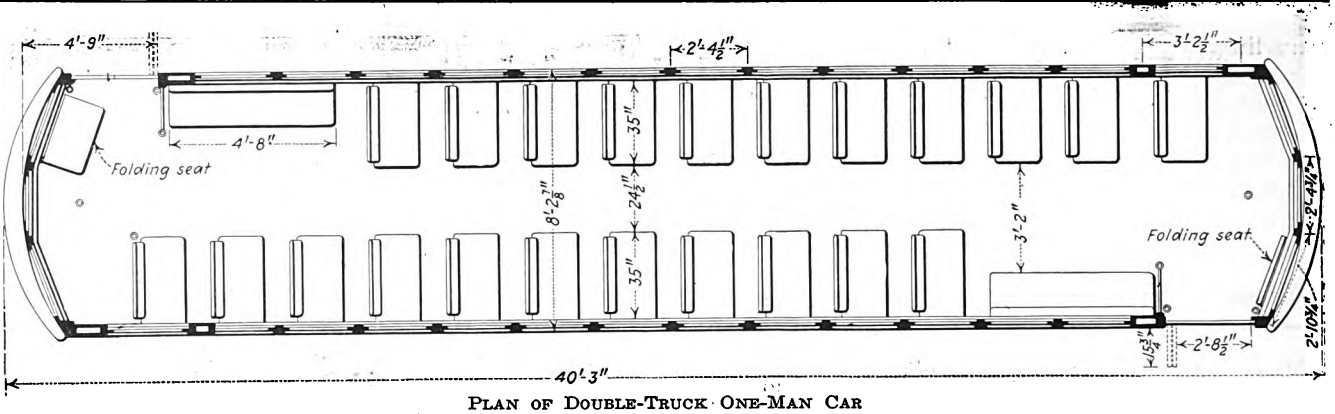


PLAN OF DOUBLE-TRUCK ONE-MAN CAR

side sheets are $\frac{3}{32}$ in. thick patent level rolled steel in four sections, the belt rail is 2½-in. x ⅜-in. steel and the letterboard No. 18 steel.

Vestibule top plates, hood rim, hood carlines, posts and ribs are of white ash. Dashers of No. 14 sheet steel in three pieces are used and platform floors are ⅞-in. hard maple. The bumper is a 3-in. 6-lb. channel.

The roof is of the plain arch type having ½-in. grooved poplar planking laid lengthwise, and covered with No. 8 cotton duck laid in white lead. The car floor is double laid with the bottom half of ⅝-in. clear spruce and the top half ¾-in. hard maple. The aisle flooring is covered with ⅛-in. corrugated rubber matting 18 in. wide, which extends to the middle of the vestibule floor. The steps are the folding type 34-in. x 10½-in. x 1¼-in. maple fitted with a 3-in. special safety treads.

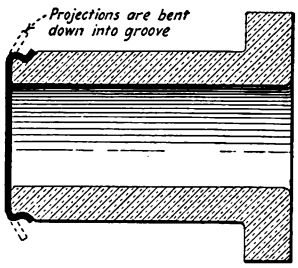
Cherry has been used for the interior finish including the moldings. No headlining was used and the carlines and roof boards are white enameled. The interior of the car body below the belt rail is lined with ¼-in. Agasote painted to match the cherry finish.

There are 22 Brill "Waylo" type reversible cross seats having cherry slats, pressed-steel ends and pedestals. The longitudinal seat at the opposite ends of the car are also of cherry.

The body panels and letterboard are painted Pullman green, the posts cream color and the sash mahogany. There are ten 23-watt lamps on each side of the car, two over each door and two in the illuminated signs, with 46-watt lamps in the headlights. The lower side windows are fitted with storm sashes for winter service and with window guards during the summer.

An Inexpensive Armature Bearing Cap

THE New York State Railways, Rochester lines, is using a cap made of tin as a substitute for the counterbored cap sometimes used as a waterproof and dustproof covering for the outside ends of armature bearings. Trouble was experienced with the usual type of cap falling off and becoming loose when used on bearings that were worn, so that proper attachment could not be secured. The tin cap which is now used is stamped out and given a slight angular turn at the edges. In order to fasten the tin cap to the bearing a tapered slot is cut in the outside near the end. The tin is then crimped into the slot so as to give a secure fastening. This is done by a tool at the same time that the bearing is turned to fit the armature shaft. When the bearings require rebabbitting again the tin cap is thrown away and a new one used.

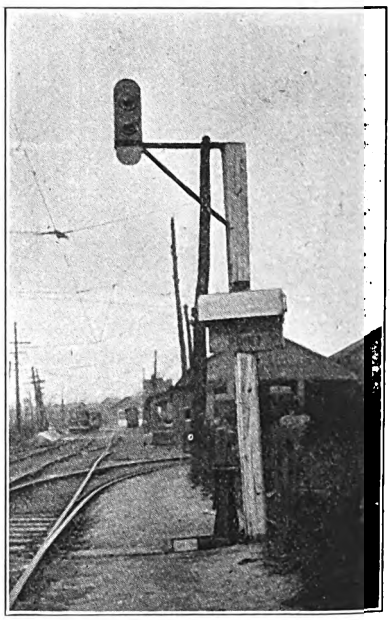


TIN DUST GUARD FOR ARMATURE BEARINGS

A method quite similar to this is used by the Kansas City (Mo.) Railway and was described in the ELECTRIC RAILWAY JOURNAL for July 29, 1916, page 197. Another method using a thin sheet steel disk which fits into the end of the armature bearing is used by the Elmira Water, Light & Railroad Company and was described in the July 7, 1917, issue, page 23.

Positive Switch Combined with Signal Provides Desired Protection

AT A POINT where the track leads off the main line of the Pennsylvania-Ohio Electric Company, to serve the Haselton car shops at Youngstown, Ohio, a simple spring switch, normally set for main-line traffic, was formerly used. There are frequent car movements out of the shop yards onto the main line and much trouble was had with split switches because the men were not careful to get the following trucks out clear of the switch before starting back on the main line. To overcome this possibility of trouble, a Bethlehem safety switch stand which locks in both positions was installed. This is a switch stand which always revolves in one direction and which snaps and locks into the new position as soon as a car forces the switch point over slightly, or as soon as pressure is applied to the switch stand handle. This has completely overcome the splitting of the switch, for there is no dependence placed on the spring to bring the switch to main-line position and the switch point is locked positively in either one position or the other. This makes it necessary for a crew bringing a car out on the main line to throw the switch by hand before starting back on the main line, yet permitting movement through the switch onto the



SAFETY SWITCH STAND AT SHOP YARDS TURNOUT EQUIPPED WITH MAIN LINE ELECTRIC SIGNAL INTERLOCK

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main line without having to set it for the branch-off in advance of the car.

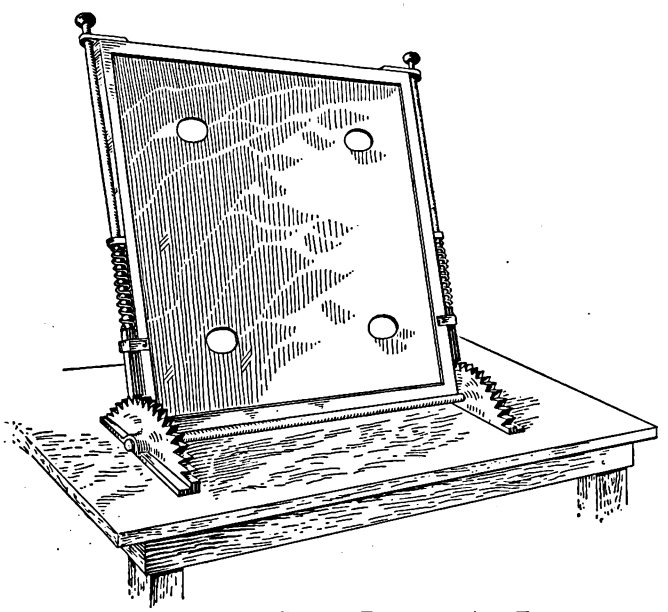
The installation of this type of switch necessitated some protection for the main line, for it will readily be seen that the switch point might be left in the wrong position for main-line traffic. This signal protection was ingeniously provided by A. B. Creelman, master mechanic. An ordinary control finger was mounted on the rod connected between the switch stand and switch point and arranged to make connection with either one of two contacts. When the switch point is in the shop track position, the connection lights a red signal, and when it is in the main line position, the connection gives the green light signal for main-line traffic. This simple contact mechanism was housed in a steel box located just in front of the switch stand, providing ample protection from the elements.

Practical Kinks from Hampton

Some of the Devices Which Have Proved of Great Assistance in Maintenance Work Include a Hydraulic Portable Pinion Puller, Tank for Cleaning Various Parts and a Rig for Testing Circuit Breakers

THE repair shops of the Newport News & Hampton Railway, Gas & Electric Company are in Hampton, Va., adjoining the main offices and carhouse of the company and are in attractive surroundings. There is plenty of room to expand and the shops have light on all sides. Perhaps it is because of these attractive surroundings that much original work in the way of improved methods of doing things has been developed at the Hampton shops.

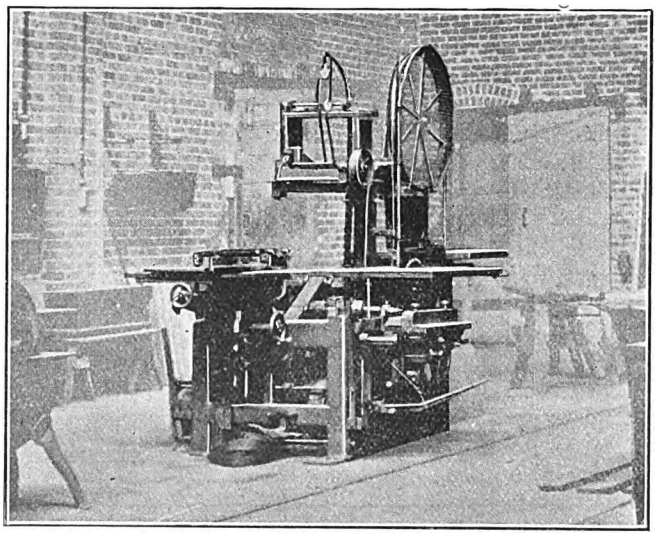
A recent visit to the shops by a representative of this paper disclosed a portable pinion puller, operated by the hydraulic process. The increase of power in this



FRAME ON WHICH CIRCUIT BREAKERS ARE TESTED. IT CAN BE SET AT ANY ANGLE

device is such that a force of 50 lb. on the handle of the puller will develop 40,000 lb. on the ram. A section and a photographic view are given.

In the operation of this puller oil or other liquid is pumped from the reservoir shown at the right in the section through the small duct and valve into the ram chamber, which is set to push against the end of the armature shaft. An extension of the frame of the ram

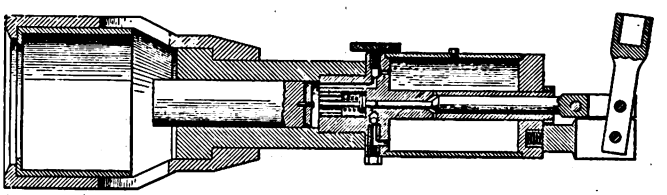


CORNER OF WOODWORKING MILL—VARIETY MACHINE AT LEFT

carries two collars with clamps to join them together, the outer collar having jaws to fit around the pinion to be removed. When the pressure is to be released, the liquid is allowed to flow back into the reservoir by the turn of a setscrew. The puller is the invention of C. W. Wood and E. C. Kelly, both connected with the railway company. It has been patented and has been placed on the market by the Electric Service Supplies Company. It has been in use in Hampton for about three years.

In operation this pinion puller clamps over the pinion, pulls in a straight line and therefore can be applied to the armature without removing the latter from the motor. It has ample power to remove pinions of any size used in electric railway service and a few strokes on the operating lever are sufficient to start the most obstinate pinion. The jaws consist of two heavy steel castings held together by quick-acting clamps with the inside face machined to take hold of new or badly worn pinions. These jaws are furnished in two sizes, which together take in the range of pinions in ordinary use. The pinion puller weighs approximately 50 lb. and is provided with a handle for convenience in carrying. As the puller is portable it can be readily carried to the pinion to be removed.

In the rear of the repair shop there is rigged up a small dipping tank for cleaning housings, bearings, brake hangers and other truck parts. The dipping tank is an old metal oil barrel heated with gas and resting on the carriage of a small chain hoist by which the parts are lowered into the tank in a wire basket. The company is using with success a cleaning mixture called "Oakite Platers' Cleaner," which has been found to clean metal parts three or four times as rapidly as



SECTION OF HYDRAULIC PINION PULLER

lye and to last almost indefinitely if about 10 per cent a week of the cleaner is added to the solution.

In the woodworking shop the company has recently installed a machine, illustrated in the accompanying

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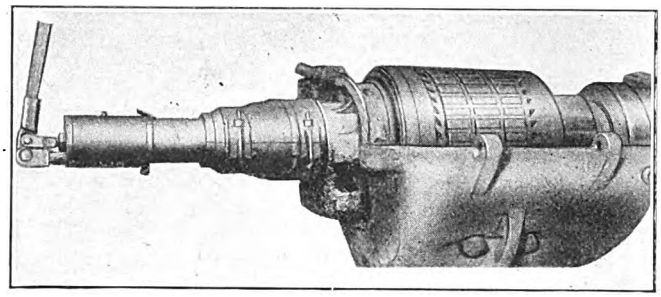
photograph, which performs a great many functions: It is a band saw, a trip saw, horizontal borer (used as a hollow chisel mortiser), a shaper and a joiner and has a planer attachment. It was made by the Sidney Machine Tool Company of Sidney, Ohio.

In its electrical department the company has a rig for testing circuit breakers by which it is possible to



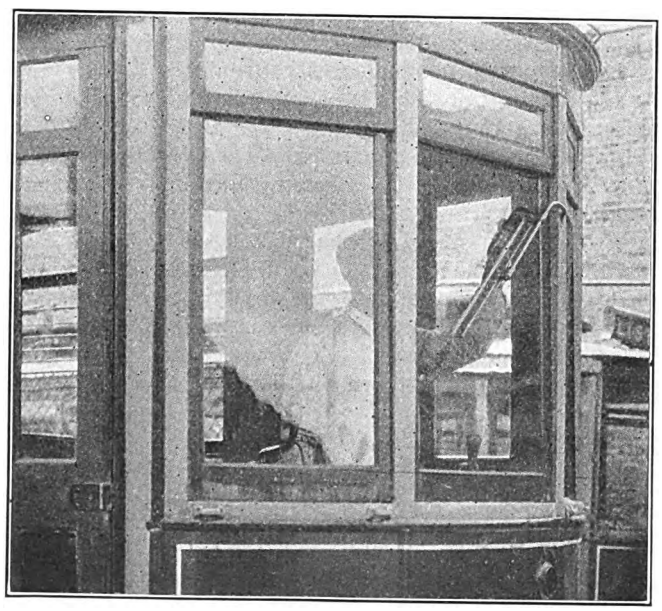
REMOVING A PINION WITH HYDRAULIC PULLER

duplicate the conditions, so far as position is concerned, of those in which the circuit breaker is placed on the car. It consists of a frame which can be set at any angle by means of a pawl and ratchet. After the circuit breaker to be tested is bolted to the frame, the latter may be set vertically or horizontally, at 45 deg. or at any other angle in which the circuit breaker is attached to the car. In this way the calibration of the breaker can be made more accurate than if the test was conducted only in the one position.

During 1921 the company got a mileage from its brake shoes of 15,500 and from its trolley wheels of 7,000. The mileage per failure last year was 5,800, or 1.11 per cent of the cars operated.

Window Wiper Speeds Up Operation

SO MUCH trouble has been experienced by motormen when the glass window pane in front of them becomes obscured in bad weather that some sort of mechanical window wiper is a necessity. The type shown in the



MECHANICAL WINDOW WIPER IN MILWAUKEE

accompanying illustration was developed in the Cold Springs shops of the Milwaukee Electric Railway & Light Company. This device permits the motorman to clean the outside glass surface without having to move from his customary place. He operates the device by turning slightly the handle that is located on the inside window framing. The wiper, which is formed of a rubber strip in a metal holder, moves radially in a vertical plane across the glass surface. This holder is attached to the outer end of an arm of roundbar steel which passes through the window framing. The device is inexpensive, simple in construction and has been installed on more than 1,000 cars of the Milwaukee system.

What's New from the Manufacturers

Cost of Thermit Welds Reduced

AS A result of an investigation by the research department of the Metal & Thermit Corporation, New York, to reduce the cost of Thermit welding, it has been found that economies amounting to 10 per cent or more can be made in regard to the amount of Thermit required to make a weld. These result from reducing

THERMIT REQUIRED FOR WELDING VARIOUS SECTIONS

Width of Section, In.	Depth of Section, In.	Width of Gap, In.	Width of Thermit Steel Collar, In.	Thickness of Thermit Steel Collar Center, In.	Heat, Gate, In.	*Pour Gate, In.	Riser Dia., In.	Recommended Amount, Lb.
3	2	3/8	2 1/2	1/2	1	1	1 1/2	10
3	2 1/2	3/8	2 1/2	1/2	1	1	1 1/2	12
3	3	3/8	3	1/2	1	1	1 1/2	16
3	3 1/2	3/8	3 1/2	1/2	1	1	1 1/2	20
3	4	3/8	3 1/2	1/2	1	1	1 1/2	25
4	4	3/8	4	1/2	1 1/2	1 1/2	2	40
4	4 1/2	3/8	4	1/2	1 1/2	1 1/2	2	45
4	5	3/8	4	1/2	1 1/2	1 1/2	2	50
4	5 1/2	1	4 1/2	1	1 1/2	1 1/2	2	60
4	6	1	4 1/2	1	1 1/2	1 1/2	2	65
4 1/2	4 1/2	1	4 1/2	1	1 1/2	1 1/2	2 1/2	60
4 1/2	5	1	4 1/2	1	1 1/2	1 1/2	2 1/2	65
4 1/2	5 1/2	1 1/8	5	1 1/8	1 1/2	1 1/2	2 1/2	70
4 1/2	6	1 1/8	5	1 1/8	1 1/2	1 1/2	2 1/2	75
5	5	1 1/8	5	1 1/8	1 1/2	1 1/2	2 1/2	75
5	5 1/2	1 1/8	5	1 1/8	1 1/2	1 1/2	2 1/2	80
5	6	1 1/4	5 1/2	1 1/4	1 1/2	1 1/2	2 1/2	85
5	7	1 1/4	5 1/2	1 1/4	1 1/2	1 1/2	2 1/2	90
5 1/2	5 1/2	1 1/4	5 1/2	1 1/4	1 1/2	1 1/2	2 1/2	85
5 1/2	6	1 1/4	5 1/2	1 1/4	1 1/2	1 1/2	2 1/2	90
5 1/2	7	1 1/4	6	1 1/4	1 1/2	1 1/2	2 1/2	105
6	6	1 1/4	6	1 1/4	1 1/2	1 1/2	3	100
6	6 1/2	1 1/4	6	1 1/4	1 1/2	1 1/2	3	115
6	7	1 1/4	6 1/2	1 1/4	1 1/2	1 1/2	3	125
6 1/2	6 1/2	1 1/4	6 1/2	1 1/4	1 1/2	1 1/2	3 1/2	130
6 1/2	7	1 1/4	6 1/2	1 1/4	1 1/2	1 1/2	3 1/2	140
6 1/2	8	1 1/4	7	1 1/4	1 1/2	1 1/2	3 1/2	150
7	7	1 1/4	7	1 1/4	1 1/2	1 1/2	3 1/2	150

*Diameters shown above for pouring gates are mean diameters. In practice these pouring gates should be tapered, bottom diameter being approximately 1/4 in. less and top diameter approximately 1/4 in. greater than dimensions given.

the size of the collars or reinforcements of Thermit steel, also from narrowing the gap and changing the proportions of gates and risers. For instance, a weld on a 2-in. x 3-in. section, for which 40 lb. of railroad Thermit used to be recommended, now can be made with only 10 lb. of Thermit. On a 3-in. x 4-in. section, where 55 lb. was formerly recommended, 25 lb. only is needed, providing the size of collar, width of gap and size of the various gates are proportioned in accordance with the dimensions now found best.

The accompanying table gives the width of gap, width and thickness of collar, size of gates and quantity of Thermit which are now recommended in welding all sections from 3 in. x 2 in. in size up to 7 in. x 7 in.

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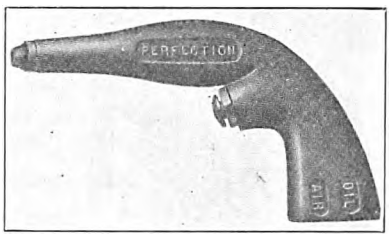
New Syphon Sprayer Gun

THE accompanying illustration shows a form of syphon sprayer for cleaning and applying liquids of various kinds by means of compressed air. This is being introduced under the trade name of "Perfection Engine and Machine Washer," by M. W. Bailey, New York, N.Y. The complete equipment includes 6 ft. of oil-proof flexible metal hose, an air hose nipple, steel nozzle, and 12-in. extension nozzle. The gun is used for applying wood preservatives, insecticides, creosote, thin paint, whitewash, etc., or wherever a syphon sprayer can be used to advantage. Several electric railways are using the gun for cleaning gear cases and truck parts.



SYPHON SPRAYER GUN

The gun is operated by pressing the valve button and a direct spray follows. The air pressure has a tendency to break the oil or solvent into a fine spray which is effective for cleaning.

Lead Alloy Bearing Metal Developed

THE United Lead Company has brought out an electrolytically produced calcium-barium-lead alloy that it is claimed possesses all the requisites of a good bearing metal. Frary metal, as it is called, is said to have good anti-frictional properties, since it retains largely the characteristics of lead in respect to plasticity. It is claimed that the property of this alloy of maintaining its hardness and strength at high temperature makes it a successful bearing metal. Its high melting point also partly accounts for this. The manufacturers say that it has the greatest hardness compatible with the necessary plasticity, but this hardness is much less than that of an axle or shaft so that in case of a dry bearing the axle is not scored, but the bearing metal itself suffers. Under working conditions the metal gradually develops fibrous structure and will take a very high polish under the revolving action of the shaft and lubricant.

The pouring and molding practice with Frary metal is not different from that of any other bearing material. Its principal physical characteristics are as follows: Tensile strength, 13,000 lb. per square inch; hardness, 20 to 30 Brinell; specific gravity, 11; melting point, 621 deg. F.; pouring temperature, 800 deg. F.; resistivity, 188 ohms per circ.mil-ft. The tensile strength of ordinary babbitt metal is about 10,600 lb. per square inch.

A number of electric railways are already using this new bearing metal on some of their cars. The accompanying table gives some results of bearings that were removed from service for inspection. All of these presented a smooth, shiny surface and none had worn down to the point requiring recasting. The remaining bearings of the various sets are still in use.

	Number of Bearings	Total Weight of Car	Maximum Speed M.P.H.	Mileage	Time in Use, Months	Loss in Weight, Ounces	Type of Bearings
Indianapolis & Cincinnati Traction Company	8	102,000	80	77,635	11	7	solid
Buffalo & Lake Erie Traction Company	8	63,200	35	37,296	8	..	solid
New York, Westchester & Boston	8	120,000	42	68,017	13	..	lined
Schenectady Railway	8	69,620	50	19,922	5	16	solid
Western Ohio Railway	8	66,000	..	40,000	5½	..	solid
Cincinnati Traction Company	4*	34,400	..	9,126	2½	10	solid
New York, New Haven & Hartford Railroad	8	234,640	40	102,947	26	..	lined

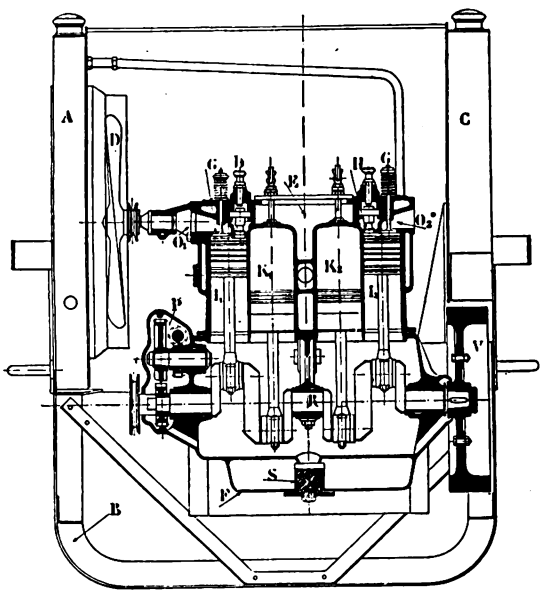
*Does not include two pony trucks.

Light, Self-Contained Gasoline-Motor Air Compressor

For War Work in Drilling with Air, Etc., an Italian Automobile Manufacturer Developed a Novel Type of Compressor Which Has Now Been Made Available for General Use

DURING the war the Diatto Automobile Company of Italy was called upon to produce a light, portable air compressor with automobile gasoline-engine drive. The experience thus gained has been utilized in a peace-time machine of this type which is now being manufactured in more than one country of Europe.

The machine consists essentially of four cylinders in one block, two being engine cylinders and two compressor cylinders. Their pistons are connected to the same crankshaft, which carries a flywheel and a starting crank, and the engine valves are controlled by means of a camshaft. The engine as a whole is cooled by means of an automobile radiator and fan, and a pump is provided to circulate water around the compressor cylinders.



CROSS-SECTION OF DIATTO GASOLINE-MOTOR COMPRESSOR

A—Radiator. B—Angle-iron frame. C—Gasoline tank. D—Fan. E—Compressed-air chamber. F—Oil case. G, G—Cam-operated air inlet valves. H, H—Automatic air outlet valves. I_1, I_2—Compressor cylinders. K_1, K_2—Motor cylinders. O_1, O_2—Air inlets to compressors. P—Water circulating pump. R—Crankshaft. S—Oil strainer. V—Flywheel.

In the wartime and present designs portability has been a prime consideration, both as regards lightness and convenience of taking apart and assembling. The compact construction and the high engine speed (nor-

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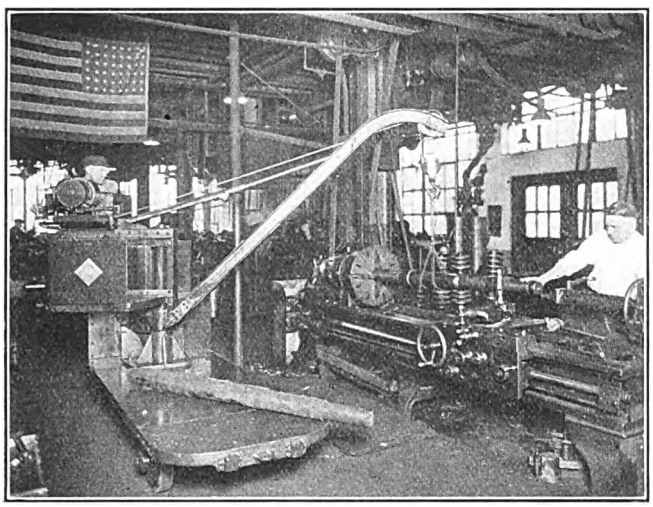
mally 1,500 r.p.m.) make lightness possible, and the general mechanical design favors the other advantages mentioned.

In the standard size described in the Jan. 28 issue of the *Génie Civil*, Paris, the motor-compressor unit weighs 794 lb., and is 4 ft. 1 in. long and high. When taken apart it consists of the motor compressor proper, weighing 254 lb., and three other pieces weighing from 175 lb. to 200 lb. each. It produces a pressure of 120 lb. per square inch, and can deliver over 50 cu.ft. of air per minute against this head. The unit can be mounted either on skids (a construction covered by the weights mentioned above) or on a wheel truck.

New Crane Truck for Shop Use

THE Elwell-Parker Electric Company, Cleveland, Ohio, has recently developed a new electric truck equipped with a revolving counterbalanced crane of unusual length. It is particularly adaptable for handling supplies in storerooms and in storage yards, as well as for serving various machine tools in railway machine shops.

The heavy vertical steel column has a long bearing in a pedestal which is bolted to the steel platform on the truck and supports a 12-ft. boom which may be racked

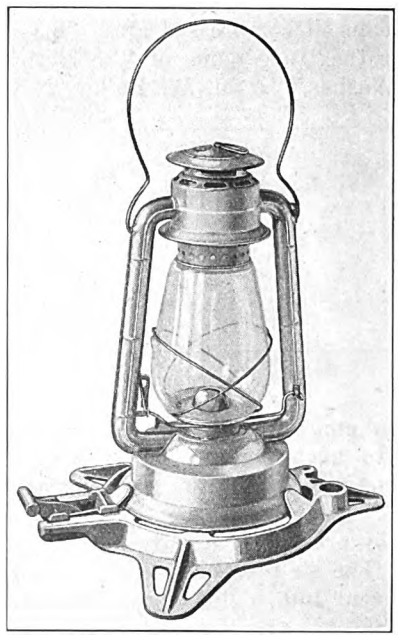


CRANE TRUCK SERVING SHOP MACHINE

in or out by the operator without leaving the driving position. The hoist is operated by a separate motor direct connected to an inclosed hoist mechanism. The controller is located on the dash in front of the crane operator. The hoist is mounted on a steel frame which houses the batteries, hoist and motors, all acting as a counterbalance. A special trip switch mounted on the front battery box stops the inward motion of the boom as set.

The crane is designed to pick up 1,000 lb. at an 8-ft. outreach, or with outriggers in position it will handle 3,000 lb. at 6-ft. outreach. The truck is equipped with 21½-in. x 3½-in. drive wheels and 15-in. x 3½-in. trailing wheels, all four of which steer. A coupler is furnished on the rear to permit using the unit for intermittent tractor service if occasion demands. Motors, differential worms, wheels and crane-pillar columns are all fitted with ball bearings. A single battery furnishes power to propel the truck as well as to operate the crane. The truck has a carrying capacity of 3,000 lb. One of the smaller though important details is the attachment or charging plug. Each battery is equipped with the receptacle end of this plug.

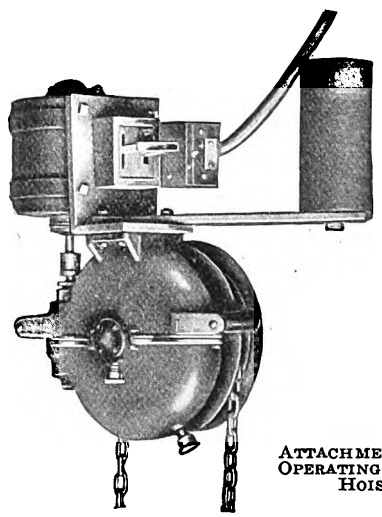
Weighting Lanterns to Keep Them in Position



THE accompanying illustration shows a lantern attached to a Drew Sentry lantern holder. This holder is built of iron and weighs 6 lb. A tension spring is provided in the base so that it will fit any size lantern. A socket is also provided for the insertion of the standard for a red flag if desired. The use of this holder prevents lanterns from being overturned by wind or storm and also prevents breaking. Wherever railway construction or repair work requires a guarding light, such a holder will be found of value.

New Electric Chain Hoist Attachment

THE accompanying illustration shows a new electrically driven attachment designed so that it can be suspended in the bight of the operating chain of a hand hoist. It has a capacity to overhaul 138 ft. of hand chain per minute and a chain pull of 130 lb. This gives



ATTACHMENT FOR OPERATING CHAIN HOIST

a load-lifting speed of approximately four times that obtainable by hand power. The machine weighs 160 lb. It is being placed on the market by the New Jersey Foundry & Machine Company, New York, N. Y.

Improved Concrete Mixing Machine

THE Foote Company, Inc., Nunda, N. Y., is bringing out a new model paving mixer, 21-E. This new model is similar to the old type 21-E, except that it is 6 in. longer in tread and frame construction and has a larger capacity drum. The new machine is rated at the same capacity as the previous type, but will have a surplus capacity.

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American Association News

Recent Engineering Association Committee Gatherings

THESE days are busy ones for the Engineering Association committees. The committee on way matters met March 29 and 30, as reported in the April 8 issue, page 605. Last week's meetings are covered below:

BUILDINGS AND STRUCTURES

The committee on buildings and structures met at the offices of the Cincinnati (Ohio) Traction Company on April 3. In attendance were: Frank H. Miller, Louisville Railway, chairman; E. H. Berry, Cincinnati Traction Company; J. R. McKay, Indiana Service Corporation, and L. C. Mayer, York Railways.

On the subject of shop layouts, blue prints and data furnished by N. E. Drexler were examined and referred to the appropriate sub-committee for digest. Similarly, other assignments were referred to sub-committee chairmen, all of whom will forward their reports to Chairman Miller by May 1. The committee was also apprised of the offer of the railways bureau of the Portland Cement Association to furnish accurate information on cement and concrete. The next meeting was appointed to be held in Pitsburgh during the first week of June.

POWER DISTRIBUTION

A two-day meeting of the committee on power distribution was held in New York City April 3 and 4. Chairman M. B. Rosevear, Public Service Railway, presided and present also were the following: J. R. C. Armstrong, Brooklyn City Railroad; C. C. Beck, Ohio Brass Company; H. S. Burd, National Conduit & Cable Company; C. A. Butcher, Westinghouse Electric & Manufacturing Company; R. W. Eaton, public service engineer, Providence, R. I.; L. F. Griffith, Little Rock (Ark.) Railway & Electric Company; H. D. Hawks, Anaconda Copper Mining Company; Adrian Hughes, Jr., United Railways & Electric Company, Baltimore; F. McVittie, New York State Railways, Rochester; H. S. Murphy, Philadelphia Rapid Transit Company; G. Hall Roosevelt, General Electric Company; F. J. White, the Okonite Company.

Mr. Rosevear reported regarding the conference on overhead crossings held under the auspices of the American Engineering Standards Committee. (See ELECTRIC RAILWAY JOURNAL, March 11, 1922, pages 393 and 414.) He said that the steering committee appointed at the conference, on which the American Association has but two representatives, is considering the inclusion of Part 4 of the National Electric Safety Code. An effort will be made to increase the representation of the association.

The chairman also called attention to the importance of co-operation with other associations regarding inductive interference and the committee referred his suggestion to the executive committee.

In the same general field the following motion was passed:

> We recommend to the executive committee that by means of letters to company members, publicity in *Aera*, or any other available methods, member companies be requested to co-operate in keeping the association advised of pending or contemplated action by public authorities in establishing laws or regulations in engineering matters affecting construction or operation; also that association headquarters should be similarly advised regarding pending or contemplated establishment of recommended practices or standards by associations or others.

In regard to the activities of sub-committees which are studying subjects already referred to the A. E. S. C. it was voted that they co-operate actively with representatives of the Engineering Association on A. E. S. C. committees.

The wear and the composition of trolley wire were extensively discussed by the committee and arrangements were made to secure experimental data. The A. S. T. M. will be approached, also, with a view to agreement on a joint specification.

The 1921 report of the American Committee on Electrolysis was next discussed, and arrangements were made to co-ordinate, through Mr. Hughes, the comments of the way, power generation and power distribution committees.

Finally Mr. Roosevelt reported on the plan for a thesis on the automatic substation, to include average data secured by canvass as applied to a special case of urban transportation.

EQUIPMENT COMMITTEE

A two-day session of the equipment committee of the Engineering Association was held in New York April 5 and 6. Those present were R. H. Dalgleish, Capital Traction Company, Washington, D. C., chairman; Daniel Durie, sponsor, West Penn Railways, Pittsburgh, Pa.; W. S. Adams, the J. G. Brill Company; H. A. Benedict, Public Service Railway of New Jersey; L. J. Davis, Brooklyn City Railroad; J. L. Gould, Wilmington & Philadelphia Traction Company; Stuart Hazelwood, Midvale Steel & Ordnance Company; J. M. Hipple, Westinghouse Electric & Manufacturing Company; A. J. Miller, Association of Manufacturers of Chilled Car Wheels; M. O'Brien, United Railways of St. Louis; E. D. Priest, General Electric Company; P. V. C. See, Northern Ohio Traction & Light Company; C. W. Squier, ELECTRIC RAILWAY JOURNAL; R. W. Steigerwalt (representing C. F. W. Rys), Carnegie Steel Company; A. Scheer, Jr., Public Service Railway, and N. B. Trist, Carnegie Steel Company. The last-named two were present by invitation.

The first day was taken up with meetings of sub-committees, in formulating reports for consideration by the committee as a whole on Thursday.

The subject of wheel contours was first discussed by the full committee. R. C. Cram and V. Angerer, representing the committee on way matters, took part in this discussion. The equipment committee concluded that standard contours for chilled iron wheels should be prepared for presentation in the annual report and that certain additions and modifications should be made to the flange contours for steel wheels. As to the recommendation of the way committee for a curved contour of wheels, the equipment committee felt that it would be impracticable to turn wheels to the contour recommended and, further, that wheels as actually turned to contours now recommended differ very slightly from the new contour proposed.

The sub-committee on helical gears presented a compilation of answers received to a questionnaire on this subject. The information received by the questionnaire method was considered to be of insufficient value to warrant its continuance. To arrange for more definite and accurate information, it was suggested that the representatives of the General Electric and Westinghouse Companies submit a list of questions which will aid in bringing about a clear understanding of conditions, for consideration at the next meeting.

The subject of trolley contact devices was discussed and some replies to a questionnaire which had been sent out were examined. The replies received so far are insufficient for definite conclusions. The chairman of this committee will tabulate answers as they are received and submit recommendations with his report at the next meeting.

A very complete report was given by the chairman of the sub-committee on possible revisions of existing standards and specifications. The recommendations included allowance for press fit for solid gears, a flange of the gear seat on axles, additional wheel contours and fillets for standard axles and journal bearings. The recommendations decided on will be incorporated in the final report to be submitted at the next meeting, which will be held the latter part of May.

PURCHASES AND STORES

A meeting of the committee on purchases and stores of the Engineering Association, held in New York City, on April 7, was attended by W. H. Staub, United Railways & Electric Company, Baltimore, Md., chairman; William C. Bell, Virginia Railway & Power Company; J. F. Fleming, Capital Traction Company; C. A. Harris, Pittsburgh Railways, and W. S. Stackpole, Public Service Railway of New Jersey. The subject of proper methods of taking periodical inventories with a view to adopting standard forms was discussed in considerable detail. The

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committee concluded that the inventory problem is closely associated with the work of the accounting department and that general procedure is difficult to formulate. To provide information as to various details in taking inventories, it was decided that each member of the committee should prepare a statement, accompanied by various forms used, showing in detail the methods used by his company. In addition each member will undertake to obtain similar statements from several companies in his immediate vicinity. In this way a large amount of information will be obtained for study and decision.

News of Other Associations

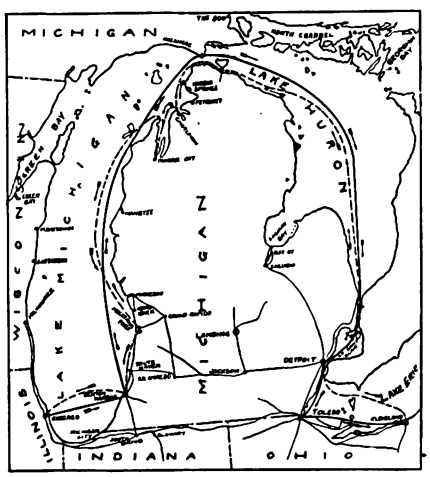
Schedule of the C.E.R.A. Cruise

SUPPLEMENTING the announcement of the six-day summer cruise of the Central Electric Railway Association, given in the issue of this paper for March 4, page 375, is the following detailed schedule, which has just been announced:

SCHEDULE FOR C.E.R.A. CRUISE—STANDARD CENTRAL TIME

	East Bound	
Lve. Chicago	Sunday	10:00 a.m. June 25
Arr. Benton Harbor	Sunday	2:00 p.m. June 25
Lve. Benton Harbor	Sunday	3:00 p.m. June 25
Arr. Mackinac	Monday	11:00 a.m. June 26
Lve. Mackinac	Monday	1:00 p.m. June 26
Arr. Detroit	Tuesday	8:00 a.m. June 27
Lve. Detroit	Tuesday	8:15 a.m. June 27
Arr. Toledo	Tuesday	1:15 p.m. June 27
Lve. Toledo	Tuesday	1:30 p.m. June 27
Arr. Cleveland	Tuesday	8:15 p.m. June 27
	West Bound	
Lve. Cleveland	Tuesday	8:30 p.m. June 27
Pass Detroit	Wednesday	6:00 a.m. June 28
Pass Port Huron	Wednesday	12:00 noon June 28
Arr. Charlevoix	Thursday	7:00 a.m. June 29
Lve. Charlevoix	Thursday	9:00 a.m. June 29
Arr. Traverse City	Thursday	12:00 am. June 29
Lve. Traverse City	Thursday	2:00 p.m. June 30
Arr. Macatawa	Friday	6:00 a.m. June 30
Lve. Macatawa	Friday	6:30 a.m. June 30
Arr. Benton Harbor	Friday	10:00 a.m. June 30
Lve. Benton Harbor	Friday	11:30 a.m. June 30
Arr. Chicago	Friday	3:30 p.m. June 30

For the accommodation of members of the party who desire to board the



ROUTE OF THE C.E.R.A. CRUISE

steamer at Chicago on Saturday evening, June 24, arrangements have been made for them to do so after 6 o'clock and have breakfast on the boat Sunday morning at a nominal price. The cost of the complete trip will be $65, and parts of the trip may be taken at appropriate rates. Members of the association may invite friends to accompany them on the trip, but these must be specially invited and tickets for them secured through the member extending the invitation.

The committee on arrangements for the cruise comprises S. D. Hutchins, chairman; John Benham, secretary; James H. Drew, Carlos Dorticos and Harry L. Brown.

Iowa Association to Meet June 23

THE annual meeting of the Iowa Electric Railway Association will be held at the Inn Hotel, Lake Okoboji, on Friday, June 23. The morning will be taken up with technical discussions and the afternoon with entertainment.

The meeting will be held immediately after the annual meeting of the Iowa Section, National Electric Light Association, and at the same place.

A. S. M. E. Addresses Are Broadcast

ON APRIL 4 messages to engineers of America, by President Dexter S. Kimball and Secretary Calvin W. Rice, of the American Society of Mechanical Engineers, were broadcast from the General Electric Station, Schenectady. The messages were heard at points as widely distant as San Francisco, Havana and the City of Mexico.

Conference on Association Waste

AT THE last meeting of the executive committee of the Society for Electrical Development a committee was appointed, consisting of C. L. Edgar of the Edison Electric Illuminating Company of Boston and E. W. Rockafellow of the Western Electric Company, to be known as its conservation committee. The purpose of this committee is to act with similar committees from other national associations in the electrical industry and avoid duplication of effort in their activities. An invitation has been extended by the society to these other organizations to appoint a similar representation to serve on a joint committee to discuss and define the most constructive and logical fields of effort for each association and effect an agreement which will eliminate overlapping and waste of resources.

It is hoped by the society that the other associations will appreciate the importance to the industry of the fulfillment of this plan and will respond to its invitation promptly and enthusiastically. It believes there is a steadily increasing tendency to criticise existing conditions, and any conservation of effort in association work will be reflected in an appreciable direct saving to the industry as a whole and increased efficiency and productivity of all co-operative effort.

Standardization of Paving Brick

THE National Paving Brick Manufacturers' Association has sent out a report of progress in the elimination of unnecessary types and sizes of paving brick. The movement is a result of the effort of Secretary Herbert Hoover to eliminate waste in industry.

On March 27 there was held in Washington the first meeting of a permanent committee, representing producers and buyers, which was appointed at a preliminary meeting held Nov. 11, 1921.

The permanent committee organized by electing E. J. Mehren, editor of *Engineering News-Record*, as chairman, and H. R. Colwell of the Department of Commerce as secretary. Organizations were represented as follows: W. A. Hull, Bureau of Standards; Will P. Blair, American Society for Testing Materials; Col. R. Keith Compton, Federated American Engineering Societies; M. B. Greenough, National Paving Brick Manufacturers' Association; L. C. Herrick, American Association of State Highway Officials; E. W. McCullough, Chamber of Commerce of the United States; V. M. Pierce, United States Bureau of Public Roads, and W. A. Durgin, chief division of simplified practice, Department of Commerce. The American Society for Municipal Improvements was represented by Colonel Compton in the absence of G. F. Fiske, the society's regular delegate.

The committee was informed that the following organizations already had formally approved the first eliminations, reducing the number of brick sizes and types from sixty-six to eleven: National Paving Brick Manufacturers' Association, American Association of State Highway Officials, American Institute of Architects, American Ceramic Society, Engineers' Club of Columbus, American Society of Civil Engineers, and the Departments of Agriculture, Commerce, the Interior, the Navy and War.

After considering new data as to total shipments of vitrified brick for 1921 the committee voted unanimously to eliminate the following sizes: Vertical fiber lug, 3 x 4 x 8½ in.; vertical fiber lug, 3½ x 4 x 8½ in.; wire-cut lug Hillside, 3½ x 4 x 8½ in.; repressed lug, 3½ x 3½ x 8½.

The following remain as the seven recognized types and sizes: Plain wire-cut, 3 x 4 x 8½ in.; plain wire-cut, 3½ x 4 x 8½ in.; repressed lug, 3½ x 4 x 8½ in.; wire-cut lug, 3½ x 4 x 8½ in.; wire-cut lug, 3½ x 3½ x 8½ in.; wire-cut lug, 3½ x 3 x 8½ in.; repressed Hillside 3½ x 4 x 8½ in.

The committee decided that with four eliminations it had proceeded as far as was desirable until there are further reactions from producers and consumers. It was therefore concluded that no further eliminations would be considered until March 23, 1923, when data on 1922 shipments will be available.

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Rejects Lease Plan

Mitten Disapproves New "L" Draft—Claims Rental Was the Only Issue Not Formerly Agreed On

President Thomas E. Mitten of the Philadelphia (Pa.) Rapid Transit Company has rejected the new lease plan formulated by Mayor Moore and recently submitted to the Council and the company. In a letter to the Mayor he said that he was not willing to discard the agreement reached after months of discussion. He said that at the Councilmanic meeting held on Jan. 9, 1922, all matters with respect to the lease were settled except the rental. Inclosed with the letter was a copy of the former lease tentatively agreed on.

It seems to be the general belief that Mr. Mitten will stand by the proposal assuming all operating losses during the first year of operation and then a graduated scale of return to the city amounting to 5 per cent in the sixth year of operation and thereafter. It is reported that Mr. Mitten's letter was entirely unsatisfactory to the Mayor.

The latest proposal by Mayor Moore on the operation of the Frankford Elevated line by the Philadelphia (Pa.) Rapid Transit Company was forwarded to the City Council on April 6, thus renewing the interrupted negotiations for an agreement on the management of this line. As was commented on editorially in the *Public Ledger* there is encouragement in this communication in that the Mayor does not stress the independent operation of the line but rather the importance of an "agreement with the Philadelphia Rapid Transit Company and the unification of the service under one management."

The outstanding feature of the new draft is the change in the rental clause. The original proposal contained a clause for a 5 per cent rental from the beginning of operation. The Mayor now recommends a sliding scale of rental commencing at 2 per cent on Jan. 1 next and increasing by increments of 1 per cent per annum until the maximum of 6 per cent is reached in 1927. A 1 per cent payment plan had been suggested by T. E. Mitten, president of the Philadelphia property. The proposed agreement is to be permanent or until 1957, when the 1907 agreement also will expire.

CHANGE IN RENTAL SUGGESTED

An important feature of the Mayor's letter is the fact that the city should share in the company's profits above the 6 per cent mark, remarking that the same treatment that is promised to stockholders should also be extended to the city. The new arrangement includes the establishment of a depreciation fund to take care of replacements necessitated by the wear on the city-owned cars to be used on the northeast line. The Mayor likens his draft to the one of March 31, 1921, in that no attempt is made to stipulate the rate of fare. In conclusion the letter said:

> If this matter can be closed at an early date it is proposed immediately to bring to the attention of your body the question of extension now agitating certain sections of the city where car riders are asking for increased service. These extensions include an arm of the Frankford L to provide high-speed service for the northern district of the city; also the Roosevelt Boulevard and cross-town lines, all of which are contingent upon the operation of the Frankford L.

In the proposal submitted by the Mayor to the Philadelphia Rapid Transit Company Oct. 1 has been set as the date when the Philadelphia Rapid Transit Company will begin operation of the Frankford line. The line will be given rent free until Jan. 1, 1923, when the new provisions of the lease will go into effect.

Railway Opposes Council's Request

The International Railway, Buffalo, N. Y., through its general counsel, C. J. Joyce of Philadelphia, attorney for the Mitten Management, Inc., has refused to allow the municipal authorities of Buffalo to make an examination of its books in connection with the pending rate case before the Public Service Commission. The City Council had asked Herbert G. Tulley, president of the International, to allow Milo R. Maltbie, the city's expert, to examine certain records for data not contained in the report to the state utilities board.

During a conference with the municipal authorities over the fare question, Mr. Joyce said the railroad had nothing to hide from its stockholders or the people of Buffalo, but he opposed the principle of opening the company's records to outside interests. The city contends that the report to the Public Service Commission does not give enough detail and the Council believes it has the right to examine the books of any public utility.

Relief Offered Injured Railway Employees

A new type of public service is being rendered by the Reconstruction Hospital, New York, N. Y., a hospital dedicated to the reconstruction of men and women injured anywhere in America in the industries. As a direct result of the worldwide experiments in rehabilitation of men injured in war, America has now a hospital the sole aim of which is to care for industrial diseases and accidents and the restoration of industrial casualties to active useful life. This hospital, with the breaking ground on April 2 for its new eleven story addition at 100th Street and Central Park West, now enters upon a national career, prepared to offer a unique service to industry. The specific purpose is to provide treatment which will not only restore the health of the injured workman but will give him back his full earning capacity as well. Electric railway employees injured in the performance of their duties may secure the necessary treatment at this hospital.

"Truth," a New A. E. R. A. Publication

A copy of *Truth* was sent under date of April 12 to members of the American Electric Railway Association. *Truth* is a clip sheet full of constructive facts about the electric railway industry, which the Committee on Co-operation of Manufacturers has had prepared for members of the association. A copy of *Truth* will be mailed to members each month, from the Advertising Section of the American Electric Railway Association.

The hope of the committee is that the member companies will get over to their employees the facts contained in this sheet. Companies that have a company publication are urged to reprint the material in *Truth*. Companies that put stuffers in pay envelopes are urged to use some of the material in them. Companies that have no printed medium are urged to use the material in talks with the men, and are being asked to put some of the facts in sales letters, or use the material in any other of the many ways which suggest themselves. The first issue of *Truth* appears as a single sheet, 8½ in. wide by 14 in. high. The foreword says:

> Issued by the committee on publicity of the American Electric Railway Association, 8 West Fortieth Street, New York, for the use of persons and organizations co-operating in giving currency to facts about electric railway conditions. Material contained herein may be used as original matter—no credit being required—in house organs, company leaflets, newspaper interviews or releases, speeches, advertisements or in any other way desired. The association, however, vouches for the accuracy of all original statements contained, and it may be given as the source of information whenever preferable to do so.

Efforts Made to Place Franchise Rights with Commission

It has been announced that the California Real Estate Association plans to place in circulation a petition for the purpose of an initiative measure to amend the State Constitution to give the State Railroad Commission the power to grant franchises to public utilities operating within or without municipalities. A tentative draft of the proposed amendment was prepared at the request of Chris R. Jones, regional director of the Real Estate Association, at the State Capitol.

In this connection, W. V. Hill, manager of the California Electric Railways Association, has issued a statement claiming that the present franchise obligations of electric railways in California are burdensome to the extent of being the cause of financial distress for the carriers. Further franchises will be assumed only under much different conditions than those assumed by the railways in the past. He said that in the larger cities of the State, with the exception of Oakland, franchises were limited to from twenty to twenty-five years and little business sagacity was required to see the difficulty of financing a property with bonds whose life extended beyond the franchise period.

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Reduces Wages Five Cents an Hour

The Manchester Traction, Light & Power Company, Manchester, N. H., has announced a wage reduction of 5 cents an hour affecting employees of the Manchester Street Railway, the Manchester & Derry Street Railway and the Manchester & Nashua Street Railway. The new rates, effective April 1, 1922, to April 1, 1923, in cents per hour are as follows:

Conductors and motormen	
First three months	45
Next nine months	50
Thereafter	55
The rate established for overtime is one-fifth of the regular rate, and the morning reporting time rate is reduced 60 per cent.	
Snow plow work	
Motormen	70
Sixteen trackmen	60
Outside men	company to make price.
Carhouse men	
Day foreman	$46.15 per week
Night foreman	67½
Night repair man	52
Bolt man	56
Air brake and miscellaneous men	66
Painter—foreman	70
Blacksmiths, pitmen and painters	59
Armature winders	73
Head inspector of equipment	62
Other inspectors of equipment	59
Helpers, car sweepers and cleaners	51
Trackmen	
Track foreman	$45.56 per week
Seven permanent trackmen	53½
Nine permanent trackmen	50
Linemen	
Foreman	74½
Lineman	66
Lineman	60

The rates of wages for motormen and conductors in effect from April 1, 1920, to April 1, 1921, were 50, 55 and 60 cents per hour. From April 1, 1921, to July 15, 1921, this agreement was modified so that a reduction of 5 cents per hour was in effect during that period. After July 15, 1921, the schedule April 1, 1920, to April 1, 1921, was in force.

Service to Be Resumed in Augusta

Service will probably be resumed in Augusta by the Augusta-Aiken Railway & Electric Company on Saturday, April 15. News to this effect was contained in a telegram received from Augusta on April 14 in which the information was conveyed that the City Council on the night of April 12 had passed resolutions regulating the jitneys. As Friday was a holiday in financial circles in New York it was impossible to secure any further details from the J. G. White Management Corporation before going to press. That the situation in Augusta was fast heading toward an adjustment is indicated in the following account of some of the recent moves made there in connection with the controversy.

Mayor Julian M. Smith was requested by members of the Council of Augusta, Ga., to call a special meeting of that body for April 12 to discuss and act on the jitney and electric railway controversy.

Charles S. Banghart, vice-president and general manager of the company, had previously indicated to the Council that the executive committee of the company had declined to authorize him to put cars in operation again on the terms which had been suggested by the committee of the Council. The attitude of the executive committee was that it had been demonstrated by experiment that the company could not make actual operating expenses on the terms suggested by the committee.

Mr. Banghart indicated that if the city could see its way clear to remove the jitneys two blocks from car lines, instead of one, and prevent them from taking on and discharging passengers within two blocks of any trolley line, his company would re-start the cars, adopting the schedules mentioned in the committees' proposal and put on a 7-cent, instead of an 8-cent token fare for the general public, a 5-cent fare for school children and teachers. There would, however, have to be a 10-cent fare for the casual rider who refuses to buy 7-cent tokens. Mr. Banghart said:

> If the city should not find itself able to remove the jitneys two blocks as above set forth, but only one block as stated in the committee's proposal then the company in its excessive desire to meet the wishes of the public for restoring car service in the city will consent to this modification on condition that jitneys are not to cross Broad Street and that if after thirty days' trial the jitney competition still materially cuts into the railway's legitimate revenue, the city will then consent to remove them two blocks and in default the company is to be free to exercise its legal right again to stop the cars.

Millions for Improvements

Anticipating formal ratification at its next meeting by the Commission Council of New Orleans, La., of the agreement reached by the Council and the representatives of the security holders of the New Orleans Railway & Light Company, Commissioner Maloney on April 11, addressed himself to Receiver J. D. O'Keefe, on the subject of the immediate purchase of 100 new cars. The estimated expense of the equipment is said to be $1,000,000. The cars may now be purchased as under the agreement now reached several million dollars will be provided for improvements, which will include rehabilitation of the electric department by providing more power. The company's equipment at present consists of 550 cars, of which number only 475 cars are in operation.

Service-at-Cost Measure Signed

Governor Miller of New York has signed the Dick bill amending the public service commission law. The new measure defines service-at-cost contracts and authorizes municipal corporations with less than 1,000,000 population and street surface railroad corporations to enter into these contracts after public service commission approval.

A service-at-cost contract is defined to be an agreement between a municipal corporation and a street surface railroad corporation, providing generally for operation of a street surface railroad, wholly or partly in the limits of the municipal corporation, with a rate of fare directly or indirectly dependent on the excess of revenues after deduction of expenses and charges. All municipal corporations having less than 1,000,000 population and street railroad corporations now existing or which shall hereafter exist, may enter into such a contract. A ten days' notice to the Public Service Commission is required for its approval, which may be given to any such contract entered into after July 1, 1920.

No provision of any law, general or special, unless the contrary is specifically stated in such a law subsequently in effect, shall be deemed to interfere with the service-at-cost contract authorized by the new law.

Car Shops Burn in Oshkosh

The Eastern Wisconsin Electric Company, Oshkosh, Wis., suffered the loss by fire of the principal part of its shop and storehouse on April 9. One of the new safety cars, one interurban car and one older double-track city car, all shop records and much valuable equipment and supplies were destroyed. The disaster came on the heels of one of the worst sleet storms in the history of Wisconsin, and was quite a blow to the company.

Despite the handicap which the fire imposed on the company the local city service and all interurban lines operated 100 per cent during the blaze and service has been maintained at that standard since then by the unceasing efforts of the manager and his staff.

The damage to the equipment is estimated at $40,000. The stock room contained approximately $40,000 worth of stock. It was believed at first that this stock had been entirely destroyed and that the loss would total $100,000. Investigation made the morning after the fire indicated that this loss was not nearly so great as had appeared at first. The damage to the building is estimated at $25,000 to $30,000.

G-E to Equip Fifteen Trolley Buses

The General Electric Company has received an order for the electrical equipment for 15 new trackless trolley buses, eight of which will be operated by the City of New York on an extension to its system in Staten Island between Richmond and Tottenville. The remaining seven will be put on a new line that is to be built on City Island. The order was placed through the Trackless Transportation Corporation, New York, N. Y.

Decision of the city to increase its fleet of trolley buses is the result of the thorough commercial success attending the operation of the first buses which have been operating out of Meiers Corner, Staten Island, since Oct. 8, 1921. When these 15 buses are added to the system, New York City will have a total of 22 trolley buses in operation, all of which are equipped with General Electric motors and control and current collectors.

The automatic substation equipment will be furnished by the Westinghouse Electric & Manufacturing Company, according to report.

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Financial and Corporate

Toledo Property Reports

Deficit Under Service at Cost—Lower Fares Depend Upon Action to Regulate Buses

Operations of the Community Traction Company, Toledo, Ohio, for the eleven months of 1921 under the service-at-cost ordinance put into effect on Feb. 1, showed a deficit of $325,036 as reflected in the stabilizing fund. The annual report has been published by the Toledo *City Journal*, the official city publication. The passenger revenue amounted to $2,960,966. The total gross income was $3,148,889. Operating expenses totalled $2,021,870.

Commissioner Wilfred E. Cann, however, points out in his report that the car riders have been saved $327,325 by reason of the lower fares which the new plan of operation put into effect. For the first six months the fares were cut 1 cent and transfers have been cut from 2 cents to 1 cent ever since the ordinance has been in force.

From the gross revenues of the operations for 1921 there was placed in the city purchase fund $194,792, of which $149,000 was used on Feb. 1, 1922, to purchase 6 per cent bonds of the Community Traction Company. These, together with what may be purchased in July, will make the city's income from bonds alone about $12,000 a month. The city fund at the present time amounts to nearly a quarter of a million dollars. During 1921 there was spent on maintenance of tracks, equipment and trolley wire the sum of $560,628.

At the end of the year there were cash balances in the depreciation fund of $5,789, in the reserve for injuries and damages of $11,291, and in the reserve for taxes of $109,913, or a total of $126,993.

The revenue per car-mile increased from 38.045 cents in July to 46.354 in December. The high point in cost of operation per car-mile was in February with 42.863 cents, which consistently declined to 30.498 cents in December.

During February there was carried an average of 8.81 revenue passengers per car-mile. This ratio declined till a low point was reached in August with 7.01 passengers per car-mile. The December loading was at the rate of 7.95 passengers per car-mile. With a yearly average of 8.5 passengers a car-mile, Commissioner Cann declares the lines would be on a good financial basis.

An increase of less than 600,000 passengers a month will make for successful operation. Last March had 700,000 more riders than there were in December, so the possibility of wiping out the deficit appears very good.

In the report the commissioner tells the Council that it must take more drastic action to regulate the buses if the concerted effort of all to bring lower fares is to be successful.

A comprehensive grade separation program is urged as a means of working out further economies in street railway operation. The commissioner also tells the Council that there are forty locations in Toledo where the street railways cross steam railroad tracks and 112 crossing diamonds to maintain. He says further rerouting plans will be developed during the year.

The record of the claims department was notable during 1921. For the eleven months 2.573 per cent of the gross revenue was set aside in the reserve for injuries and damages. This amounted to $79,905. Actual settlements and operation of the department took only $68,614, equivalent to only 2.214 per cent of the gross revenue. Better results may be attained by more careful regulation of traffic on the streets, according to the commissioner.

Of the 2,295 accidents reported by crews operating street cars, 1,323 covered collisions with automobiles, and of the 425 cases settled 143 representing collisions between cars and autos were disposed of by payment to claimants of $9,189.

"The year 1921 ushered in a new era in local transportation in Toledo," said Mr. Cann. "Control of street railway service is now vested in the city, where it properly belongs, and your local transportation system is today, to all practical intents and purposes, solely that of the people of Toledo."

Salt Lake City Property Reports

A net revenue of $84,815 was earned by the Bamberger Electric Railroad, Salt Lake City, Utah, during 1921, according to figures presented by the company in its annual report, which has just been filed with the State Public Utilities Commission. The operating income of the road was $33,654, with a gross income amounting to $48,558. From this figure the railroad claims deductions for interest, taxes, rents, etc., of $82,213, making a deficit of $33,655 transferred to profit and loss during the year. The principal source of revenue for the railroad was the passenger service, which yielded $471,719, yet this was $79,067 lower than the 1920 passenger revenue.

The railroad claims investments to a total of $3,910,442, this being an increase over the preceding year of $102,448. Par value of the capital stock Dec. 31, 1921, aggregated $1,500,000. The average investment per mile of road was $102,676, the total investment in road and equipment being $3,690,188. The book value of investment in the Lagoon resort and the Salt Lake Terminal Company is given by the company at $147,652.

To Take New York Depositions

Minneapolis Valuation Hinges on City's Access to Books—Hearing Set for April 25

Neil M. Cronin, city attorney of Minneapolis, Minn., is in New York to take depositions of four witnesses in the mandamus action against the Twin City Rapid Transit Company and allied corporations to get access to minute books and other records. Depositions were begun on April 11 before William Bradford, notary public. The city desires to ascertain the true valuation of the company's property.

The writ was signed on Feb. 9 by Judge W. W. Bardwell of the District Court, the city seeking to compel the traction officials to produce the books to aid in the appraisal being made by Delos F. Wilcox for the city in its rate litigation. The City Council had directed the company to give Dr. Wilcox access to the books, which the company is alleged to have refused to do, with the exception of the minute books of the Minneapolis Street Railway and other associated companies. Delay of twenty days to March 2 was granted on motion of the company, its plea being it would be necessary to go to New Jersey to get the books. Secretary A. M. Robertson said the Twin City Rapid Transit Company is merely a holding company and that its books have no records of the business activities of the Minneapolis company. The writ was dismissed on March 13 on motion of the city attorney and a new action begun before Judge H. D. Dickinson, who granted a writ directed against the Twin City Rapid Transit Company and the St. Paul City Railway, omitted in the first order. The New Jersey company's answer stated that that company has not been the fiscal agent of either Twin City company since 1907 and that the Transit Supply Company is the fiscal agent and its books are open. In reply to an allegation of the city that the Twin City Rapid Transit Company had arbitrarily caused substantial amounts to be paid the St. Paul City Railway on which the railway is not required to pay interest to the Minneapolis Street Railway, from which the amounts are taken, it denies that the St. Paul and Minneapolis companies are caused to assume a joint fund obligation. The two local companies executed a joint mortgage securing $10,000,000 of bonds guaranteed by the Twin City Rapid Transit Company.

Upon filing of this answer of the company on April 2 the hearing was set for April 25. This being the date set for the valuation hearing of the St. Paul City Railway before the Railroad and Warehouse Commission, St. Paul considers advancing the date so as to have a joint hearing with Minneapolis, giving the latter city no advantage over St. Paul in its proceedings to determine the basis for a true fare decision by the state commission.

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Surplus of $990,099

Virginia Property Cuts Operating Expenses—Cash Conserved for Improvements—Traffic Decreases

After deducting all charges the Virginia Railway & Power Company, Richmond, Va., realized a surplus of $990,099 for the year ended Dec. 31, 1921. Adding the surplus at the end of 1920 the total surplus as of Dec. 31, 1921, is $2,291,175. From this amount a deduction of $507,738 was made for dividends on preferred stock and an accumulated surplus remains on Dec. 31, 1921 of $1,783,437.

Gross earnings for the year amounted to $10,173,335, an increase of $179,759 over the year 1920. Operating expenses decreased from $7,080,070 to $7,067,662.

The annual report of the company shows that the property of all departments is in good physical condition. Improvement in operation is also seen from the fact that expenditures for maintenance and way and equipment amounted to $1,060,593, against $1,179,781 in 1920. In addition to the regular charges for maintenance of way and equipment an amount of $610,400, equal to 6 per cent of the gross earnings for the fiscal year, was included in the operating expenses and credited to reserve for depreciation, thus continuing the policy followed by the company during the last ten years. The balance to the credit of reserve for depreciation on Dec. 31, 1921, was $1,625,811.

The total number of passengers carried during 1921 was 105,192,532, against 113,615,675 in 1920.

In his report President Wheelwright said that on account of the necessity of making extensions and improvements in both railway and light and power departments the board of directors considered it necessary to continue the conservation of cash resources of the company so far as possible and for that reason no cash dividends were declared on the stock of the company during the year. He said further that the board of directors in its desire to deal fairly with the holders of its non-cumulative preferred stock declared a dividend of 6 per cent on preferred stock, payable in preferred stock for the year 1920, and a similar dividend for the year 1921.

Greater Volume of Business Under Negotiation

The annual report of J. G. White Companies, New York, N. Y. for the year ended Dec. 31, 1921, shows a deficit of $126,484, against a surplus in 1920 of $313,016. The total assets and liabilities as of Dec. 31, 1921, are $6,698,527.

The report states that as predicted in the previous annual report the business of the Engineering Corporation was adversely affected by the general business depression. It goes on to say further that since the first of the year a substantial amount of satisfactory business has been secured. Further improvement in this respect is anticipated as more new business is under negotiation than at any previous time for several years.

Will Vote on $300,000 Bond Issue

St. Petersburg (Fla.), will vote May 13 on a $300,000 bond issue to provide an electric plant to run its municipal electric railway and furnish power for waterworks, gas plant and street lighting.

The city attorney has been ordered to draw the ordinance and the commission will pass it and immediately call the election.

C. T. Baker, a consulting engineer, has submitted a comprehensive report covering the cost of installing and operating an electric power plant in St. Petersburg, using Diesel type engines. He suggests that the plant be located on Second Avenue south about Eighteenth Street, on the Seaboard Airline Railway. He estimates that the plant complete will cost $301,000 and that the cost of the first year's operation, including fixed charges, will be approximately $61,350, while Director of Utilities R. E. Ludwig estimates that under the latest proposed contract with the St. Petersburg Lighting Company the cost for power the first year would be $65,000 and the city would be obligated to pay for certain improvements at the privately owned plant. The estimated cost of the city plant the second year is $68,470, while Mr. Ludwig estimates the cost to the city for that same year, under a contract with the lighting company, at $112,340.

Meeting Held—Will Absorb West End Property

The Boston (Mass.) Elevated Railway's stockholders held their annual meeting on April 3 and re-elected the old board of directors. They did not fill the vacancy on the board caused by the recent death of General William A. Bancroft.

On June 10 the Boston Elevated will absorb the West End Street Railway, which it has been holding under a lease, and the West End company will pass out of existence. The West End preferred stock will be exchanged for Elevated first preferred; the West End common will become Elevated second preferred stock and the Elevated preferred stock will become Elevated third preferred rates of dividend to remain as they are today on the respective stocks.

The West End Street Railway is the owner of the surface lines in the Elevated system. When it passes out of existence some of its directors and officers may be taken into the Boston Elevated directorate, as under the law the seven directors who were elected by the elevated stockholders on April 3 have a right to increase their number to fourteen.

Protective Committee Makes Favorable Report

In the letter sent to the noteholders by the protective committee it was said that the net earnings of the Brooklyn Rapid Transit Company subway and elevated lines for the eight months ended Feb. 28, 1922, were $2,378,686. This sum is in excess of operating expenses and taxes, interest on the $22,967,000 of underlying bonds resting on the elevated lines and on the receiver's certificates and other prior charges. The showing thus made is at the rate of about 5.9 per cent per annum upon the outstanding notes and bonds of these issues, and if allowance be made for $298,606 of interest on receiver's certificates reported to be chargeable to construction this rate would be increased to about 6.7 per cent.

The letter states further that the receiver of the subway and elevated lines has been able to pay off $2,000,000 of the $18,000,000 of receiver's certificates that were originally issued, and an additional $2,500,000 have been purchased by the receiver of the Brooklyn Rapid Transit Company out of funds in his hands. In part the letter says:

> Your committee will continue to press for the necessary adjudication and to keep in touch with the further proceedings of the Transit Commission and with the operation and earnings of the properties, to the end that unless the Transit Commission should offer some basis for participation in a comprehensive plan of reorganization which the security holders can afford to accept, the committee may be in a position to proceed with the formulation of a plan of reorganization as soon as the necessary legal questions have been finally adjudicated and conditions are opportune for the raising of the money necessary to provide for the payment of the receiver's certificates and other cash requirements.

It is said that meetings have been held for some time with the object in view of effecting a reorganization of the property. Officials of the company stated that within a few months an application to lift the receivership might be made.

Judge Julius M. Mayer in the Federal District Court has signed an order directing the receiver, Lindley M. Garrison, to pay on April 15 the semi-annual coupon interest due since July 1, 1919, on the first consolidated mortgage 4 per cent gold bonds of the Coney Island & Brooklyn Railroad Company and on the 5 per cent consolidated first mortgage bonds of the Brooklyn City & Newton Railroad. The interest is to be paid at 6 per cent from the time that payment was originally due.

Seeks Bond Extension.—The Worcester Consolidated Street Railway, Worcester, Mass., has filed a petition with the Department of Public Utilities asking approval of an extension of $500,000 of 4½ per cent gold coupon bonds for five years from Sept. 1, 1922. These bonds are part of an issue of $1,000,000, $500,000 of which are dated Sept. 1, 1902, and the remainder dated Sept. 1, 1905. The new bonds, if approved by the commission, will bear interest at 7 per cent.

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Application May Be Withdrawn

Threatened Abandonment of the Springfield and Washington Line May Result in Complete Reorganization

Although application has been filed with the Ohio Public Utilities Commission for abandonment of service on the Springfield & Washington Railway, operating between Springfield and South Charleston, Ohio, with hearing set for April 14, developments indicate that the application will be withdrawn and service continued under a complete reorganization program. G. D. Baker of Springfield, son of G. W. Baker, the original owner of the line, has purchased the interests of the other heirs and announces that service will continue with a number of changes to be inaugurated. Under the reorganization now being arranged, Mr. Baker becomes president and treasurer; W. W. Keifer, Springfield, vice-president; E. W. Gangwish, Washington Courthouse, secretary; James McDaniel, Washington Courthouse, general manager, and C. J. Baugh, South Charleston, assistant general manager.

One of the first efforts of the reorganized company will be to regain the extensive freight business lost when shippers began delivering their products by motor truck. Mr. Baker declares that under a plan he has in mind he can deliver these shipments quicker and cheaper than the manufacturers can with their own trucks where they have less than a full truck load for transportation both ways. He is at present engaged in perfecting this plan and says he will make a public announcement of it within the near future.

Since the sale of the road an arrangement has been made with the Flag motor-bus line of Washington Courthouse, which has been operating buses between Springfield and Washington Courthouse and other points, whereby the bus line will operate between South Charleston, discontinuning service to Springfield. Transfers between the bus line and the traction line will be issued for persons desiring to make the through trip. Package freight between the two points will be handled in this manner also.

Mr. Baker has received the assurances of the Springfield and South Charleston Chambers of Commerce that these bodies will offer co-operation in every way possible, and already a campaign has been started for the members to make their freight shipments via the traction line. Passenger service will stop at 9 p.m. daily and freight only will be handled between that hour and 5 a.m. It is planned to make a special rate for all night freight shipments.

One of the problems which has faced the road was that of taking care of its paving assessments. In this respect, however, the Springfield Chamber of Commerce has offered its aid and an effort will be made to have the traction line exempted from any paving assessments now due or which may be levied in the future. Should this move be found impossible, the business men may propose an extra levy which it is believed will carry, inasmuch as all persons living along the line are anxious to make some sacrifice in order to keep the road in operation.

Power for the road is now being obtained from Dayton, but it is understood that the Springfield Light, Heat & Power Company will provide a contract at a much lower figure than is now being given. Attempts will also be made to operate "feeder" bus lines along the way, running from cities or towns not connected with the traction line, to a point where contact can be made with the line and transfers made. A test bus will be operated at various points to determine how practical this proposal will be.

Other traction lines in the vicinity are watching the Springfield & Washington Railway developments with keen interest inasmuch as this was one of the first roads to feel the real effect of motor bus and truck competition. It is felt that should a practical solution of the road's problems be reached so as to make it a financial success, the ideas will be worth application to other lines.

Financial News Notes

Carhouse Sale Postponed.—The sale of the carhouse property of the New York Railways at Thirty-second Street and Lexington Avenue has been adjourned until April 20. It was originally scheduled for March 30 on the steps of the New York County Court House.

Applies for Stock Sale Permission.—The Chicago, Aurora & Elgin Railroad has applied to the Illinois Commerce Commission for permission to issue $11,000,000 common stock for the purpose of acquiring the properties of the Aurora, Elgin & Chicago Railroad, Aurora, Ill.

Year's Surplus Is $113,550.—The Michigan Gas & Electric Company, Ishpeming, Mich., reports for the year ended Dec. 31, 1921, gross earnings of $553,957; net earnings of $119.055; surplus after interest and other charges of $19,758, leaving a total surplus on Dec. 31 last. of $113,550, as compared with $118.863 on Dec. 31, 1920.

Will Offer Securities.—The Wisconsin Railroad Commission has granted permission to the Wisconsin Gas & Electric Company, Milwaukee, Wis., to issue $750,000 in securities to pay for additions to power house equipment and for extensions to its lines. This company sells gas and electricity in southern and eastern Wisconsin.

Surplus of $487,521.—For the nine months period ended Dec. 31 1921, the Market Street Railway, San Francisco, Cal., realized a surplus after interest charges, etc., of $487,521. The total revenues were $7,089,944 and the gross income was $1,439,466. Total assets and liabilities as of Dec. 31 amounted to $48,696,411.

New Issue Announced.—Harris, Forbes & Company, New York, N. Y., are offering $3,000,000 of the New York State Railways first consolidated mortgage gold bonds. The bonds are dated Nov. 1, 1912, and are due Nov. 1, 1962. They are 4½ per cent securities with 2 per cent extra coupons, thus bearing 6½ per cent interest. The offering price was 95 and interest, to yield about 6⅞ per cent.

Receiver Will Purchase Coupons.—The Nassau Electric Railroad of the Brooklyn (N. Y.) Rapid Transit Company, through its receiver, has announced that it will purchase all matured coupons from the general consolidated mortgage bonds of the Atlantic Avenue Railroad. The Metropolitan Trust Company will handle the coupons. The amount of bonds outstanding of this issue is $2,241,000 on which the Oct. 1, 1919, and subsequent coupons were in default. The Oct. 1, 1919, coupons down to the April 1, 1922, inclusive are being purchased by the trust company.

Denies $325,000 Debt to Doherty Company.—Bondholders of the Toledo & Western Railroad, represented by Samuel Dority, Toledo, have filed a motion in Federal Court asking leave to file an intervening petition in the suit of Henry L. Doherty and Frank W. Frueauff, of Henry L. Doherty & Company, against the Toledo & Western Railroad. Dority denies that the defendant company is indebted to the Doherty interests in the amount of $325,000 as claimed or to the Toledo Railways & Light Company in the amount of $175,675, and asserts that Doherty and a number of other individuals interested in the company are really indebted to the company through their liability as stockholders of the company.

Abandons Part of Line.—The Lafayette (Ind.) Street Railway, Inc., has announced the discontinuance of service on the Lafayette-Battle Ground line beyond the Tecumseh Trail and the Soldiers' Home. The track beyond Tecumseh Trail belongs to the Indiana Service Corporation, and according to Allison E. Stuart, counsel for the Lafayette Street Railway, is not sound enough to be used. The Lafayette Service Company, which the Lafayette Street Railway succeeds, operated over the track, agreeing to care for the track and roadbed. The former company has not the money to make the repairs and the new company does not feel that it can make the necessary changes. The agreement between the two companies was verbal.

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Traffic and Transportation

Agreement in Spokane

After Many Months of Controversy Railway Wins Over Jitney—People Will Decide Issue

A final agreement has been reached between the Mayor and City Council of Spokane and the street railway officials of the city which terminates the warfare between the two bodies, waged bitterly for the last year, over the advent of jitneys in competition last June. Conferences looking to this settlement have been held during the past several weeks with each day's outcome not infrequently contradicting that of the day preceding. Several times it appeared that there was no hope of getting together.

CITY AND RAILWAY OFFICIALS AGREE

As the situation stands, the city officials and those of the two street railway systems, the Spokane & Eastern Railway & Power Company and the Washington Water Power Company, which are to be consolidated under one head, are in accord. It remains now for the people of Spokane to set their seal of approval upon the agreement by voting certain city charter amendments at a special election to be held on May 2. The entire article in the charter relating to franchise is to be placed on the ballot in its proposed revised form for the convenience of the voters so that there will not be the confusion which might result from the voting on the change by sections.

The jitneys, of which there are more than sixty in operation, are not to be relicensed Jan. 1 of next year. In return the railways concede a 6-cent fare by ticket and a 7-cent cash fare to the casual passenger, with universal transfer, and a 4-cent fare for school children. This agreement effective July 1 is for three years.

In the charter amendments that have to be voted upon, it is agreed that the companies may discontinue service upon a year's notice if jitney competition is renewed at any time. It is prohibited from discontinuing service upon any one part of its system in advance of the termination of the franchise for the entire system. The sprinkling of tracks on graded streets by the company is to be continued, although this was one of the burdens which the street car men asked that they be freed from.

Free rides for mail carriers are to be dispensed with, though this does not amount to anything as the section relative to this in the present franchise has been a dead letter and the government has paid for the carriers. Provision is made that all lines must have owl car service and it is probable that metal tokens will be used for the regular patrons rather than selling tickets to them. There is little question but that the people of the city are well pleased to have the controversy settled on so favorable a basis and that they will voice this at the election.

The prevailing rate of fare has been 8 cents on the street cars, with jitneys running with a 5-cent fare. Early last year the State Public Service Commission, after having had the question under consideration for some months and having held a public hearing at which the city officials bitterly opposed such increase, granted the Washington Water Power Company and the Spokane & Eastern Railway & Power Company the right to increase their fares from 6 cents to 8 cents. Mayor Fleming at the time of the hearing announced that the putting into effect of an 8-cent fare would mean the letting loose of jitney competition. He reiterated this upon the announcement of the decision by the commission, which in such decision took occasion to state that it hoped he had not made such statement in earnest and to point out the disastrous effect of such action upon the transportation situation. A committee of influential citizens sought to act as intermediaries among the companies and the Mayor and Council.

MAYOR CARRIES OUT THREAT

A compromise offer of a 7-cent fare was secured by the committee and laid before the Council, which rejected it for the reason, so the members explained, that it was not authoritative and that the 7-cent fare was for tickets, while the legal fare remained at 8 cents. The net result was that the 8-cent fare was put in operation early in June last year and the Mayor immediately took steps to carry out his threats. Shortly nondescript vehicles began to make their appearance on the street. These were succeeded as the weeks passed by better and more commodious vehicles and more of them.

The competition began to be felt more and more by the companies, with the result apparent in a gradual lessening of the frequency of service on practically all lines, the discontinuance of several and the laying off of considerable numbers of railway employees. Reports by jitneys to the city hall indicate that they carried in the peak months approximately 30,000 daily fares. The average street car business previously ran 70,000 fares, so the jitney competition cut the street car patronage almost in half. It is estimated that the fight has cost the traction people about a half million dollars, while the taxpayers of the city have also been called upon to pay costs in maintaining streets for jitney service, some additional paving authorized for them and much more on the wear and tear on paved streets, the latter an item that cannot be determined.

Submits Rate Exhibit

Railroad Commission States Electric Fares in California Are Lowest in United States

In connection with the rehearing of the Hollywood rate case regarding increase of fares on Pacific Electric lines, the California State Railroad Commission has, after the close of the rehearing, submitted to the various communities opposing the fare increases a comparative rate exhibit. The details of the rehearing were given in the ELECTRIC RAILWAY JOURNAL, issue of April 8.

The commission says that the fares in California cities are virtually, without exception, the lowest in the United States. The exhibit was compiled by the engineering department of the commission from information received in response to a questionnaire sent to 100 of the principal electric railways in America and constitutes the latest official compilation on the subject. The report is compiled as of Jan. 1, 1922. The questionnaire requested information as to the present rates of fare, reduced-rate tickets, transfer privileges, length of ride possible and other more technical information.

Referring to the California fares, the report says that with few exceptions, railway fares in California cities were either 5 or 6 cents. It was to be noted that in the cities of Pomona, Redlands, Riverside and Santa Cruz, with a 10-cent cash fare, and Santa Barbara, with an 8-cent cash fare, an endeavor has been made to enable the continued operation of street railway service by increasing fares approximately to their economic maximum. These communities were faced with the possibility of abandonment of service on account of operating losses due to automobile competition and other causes and the present fares may be considered somewhat in the nature of an experiment. In all cases in California where a 10-cent cash fare obtained it was a question either of discontinuing service entirely or collecting the maximum fare, and the cities chose the latter alternative.

Data were collected for the compilation from seventy-nine cities. From this number twelve cities have a 10-cent fare, one a 9-cent fare, fifteen an 8-cent fare, thirty a 7-cent fare, twelve a 6-cent fare and nine a 5-cent fare. Most of the cities reporting, especially those having the higher cash fares, allow a discount on the purchase of tickets or tokens in quantity. In a number of cases an additional charge is made for transfers.

The report also gave consideration to the maximum length of ride and said that on a unit fare it varied according to the different cities from approximately 2 miles in smaller towns to a maximum of 34 miles in Chicago.

In Los Angeles the average length of ride on the Pacific Electric lines performing local service is found to be 5 miles.

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Six-Cent Fare Ordered in Chicago

New Surface Lines' Rate to Go Into Effect May 1—Rate Justified by Eliminating Several Obligations Specified in 1907 Franchise Ordinances

BEGINNING May 1 the rate of fare on the Chicago Surface Lines will be 6 cents if the order of the Illinois Commerce Commission entered April 8 is carried out. The new order is "tentative, temporary and experimental" and is to be effective until Jan. 1 unless changed in the meantime. The commission expresses the belief that the 5-cent fare order which was enjoined by the federal court last November could have been made effective if there had been co-operation between the companies, their employees and the city. The companies have been collecting an 8-cent fare since July, 1920. The new order rescinds and annuls the 5-cent fare order of Nov. 23, 1921, and it is expected that steps will be taken to dismiss the proceedings in the United States court where a master in chancery was about to begin taking evidence for the purpose of deciding whether the injunction should be made permanent.

Will Likely Ask for Rehearing

By this latest order the companies' return is limited to 5 per cent. Under the order of the previous commission the rate of return was fixed at 7½ per cent, although the companies last year earned only 6½ per cent on the allowed valuation. It is understood that the companies regard the 6-cent order as confiscatory. No announcement was made as to what steps they would take, but it is likely they will ask for a rehearing and the commission will be allowed twenty days under the law to decide this question. That could be settled before the date on which the order is supposed to become effective.

Last year the gross income of the surface lines was $60,343,733 and the expense, including taxes, was $46,965,-151. The commission figures that the reduced fare will attract about 50,000,-000 additional revenue passengers, so that the gross earnings will be $47,916,228. Last year the companies used 12.78 per cent of the gross for maintenance and 8 per cent for renewals. It is proposed to combine these two accounts and allow a total of 16 per cent, which would save $4,759,187. This is practicable, it is claimed, because there is no deferred maintenance and the property is in a condition of good operating efficiency.

The companies last year carried to the injuries and damages fund $2,301,-224, and actually spent $1,762,778 from this amount. The damage reserve fund is now $2,490,359. The commission does not believe that a fund of this character should be accumulated and proposes to cut the allowance to the extent of $1,001,224 during this year. It is also proposed to save $700,000 in the allowance for materials on the theory that prices have gone down 20 per cent below the average last year. An interesting feature of the decision is the disallowance of any appropriation for sweeping, cleaning and sprinkling streets, thereby saving $607,-000 per year. On this point the commission says:

> Whatever may be the relations between respondent companies and the city of Chicago, any obligation which may be in the license contracts of said city requiring respondent companies to pay certain portions of the cost of sweeping, cleaning and sprinkling the streets is not binding upon this commission in the exercise of the police power of the State in the fixing of rates of fare to be charged and collected in the city of Chicago, and is not a proper charge to operating expenses of said companies.

Proposed Savings Total Millions

Summarizing the savings proposed by the commission, it is found that these total $7,079,411 from operation and $2,403,131 from the allowed rate of return. By inference the city will also lose its share of receipts because there would be no surplus to divide. This would save another $2,944,963. These savings would total $12,427,505, and on this basis the commission figures that the total expense will be $39,-885,000. Deducting this from the estimated gross of $47,916,000, the net return of approximately $8,000,000, or 5 per cent on the former commission's value of $160,000,000, is arrived at.

The commission agreed with the companies' estimate that taxes would again increase this year in spite of a 46 per cent increase last year and it allowed $407,000 additional for this item. It announced that further attention will be given to the valuation of the properties and for the present it would not disturb the previously allowed figure of $160,609,761. On the question of return, it said the evidence showed that interest rates have decreased 1½ per cent from peak costs and, therefore, 5 per cent would be a reasonable allowance.

On the question of high wages the order reads:

> This commission has been criticised for not ordering an immediate reduction in operating expenses of respondent companies, especially in regard to salaries and wages. Under the Illinois commerce act, this commission has no authority to make such a direct order. Where, however, it is perfectly apparent, as it is in this case, that the operating costs of a company are excessive in proper relation to the cost of labor and industries requiring similar skill, to the prices paid for the same service by similar utilities in other cities of the United States, this commission believes that not all of this excess cost should be reflected in the rates of fare charged and collected, but that a certain portion thereof should be borne by the company itself.

The maximum wage for trainmen in Chicago is 80 cents an hour and the commission points out that when this rate was fixed in 1920 the cost of living in Chicago was about 114 per cent over that of December, 1914. In December, 1921, the order says, this had receded to a point where it was 72.3 per cent over the 1914 level, when the men were receiving 32 cents an hour. Exhibits in the case showed further that the maximum wage for trainmen in a number of large cities had dropped from an average of 61.1 cents in 1920 to an average of 54.9 cents, a decrease of 10.1 per cent from the peak. Evidence showed also that from 1914 to 1918 the Chicago wage was 4.6 cents an hour higher than other properties and on this basis it would now be 60.3 in Chicago. To get to this level, it is pointed out, there would have to be a reduction of 24.6 per cent. It was stated during the hearings that the companies were negotiating with the men for a reduction in wages at the time the fare fight was renewed. The contract since that time has been continued on a month to month basis.

Big Issue Before New Council

The fare proposition in Madison, Wis., looms up as a big issue before the newly-elected City Council. The Madison Railways Company has submitted a schedule of fares which has the indorsement of the City Attorney and Mayor. It includes a 10-cent cash fare, 3-cent fare for children, seven tokens for 50 cents and books containing thirty tickets for $1.50. The company agrees to this rate if the city relieves the company from all obligations to surface the railway zones in certain streets. This work has been held up pending an agreement with the company. Just what action will be taken if the city fails to approve of this action street railway officials decline to say. It is expected, however, that the new Council will take favorable, or at least some definite action within six weeks.

Recommends Increased Railway Service

Glendale's proposal to operate a municipal bus line in Los Angeles, Cal., was rejected recently by the Los Angeles Board of Public Utilities. In rejecting the request, the board considered the reports of its chief engineer, H. Z. Osborne, Jr., and also briefs submitted by the Pacific Electric lines and the city of Glendale. Recommendation that the Pacific Electric increase its service on its Glendale line during the morning and evening rush hours was also voiced by the board. D. W. Pontius, vice-president and general manager of the company, stated that the railway would gladly comply with the recommendations. Commissioner Leeds of the board, in explaining his negative vote, said he believed that the paralleling of the Pacific Electric Railway line with a bus line for the entire distance was unfair competition. Commissioner Kennedy stated among other things that he did not think that this was any time to cripple any public utility, whether privately or publicly operated. Details of this municipal bus project will be given in BUS TRANSPORTATION for May.

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One Dollar Weekly Pass for Terre Haute, Too

The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has made application this week to the Public Service Commission of Indiana for permission to install on the 5-cent city cars of Terre Haute the unlimited-ride transferable weekly pass to be sold at $1. This will make the sixth property in the United States and the second in Indiana to use this form of transportation, the first five properties being Racine, Kenosha, Youngstown, Beaver Valley and Fort Wayne.

To prepare the carmen and the public for this innovation, E. M. Walker, general manager, invited Walter Jackson, originator of the pass, to aid in the publicity campaign. Mr. Jackson called on both the leading merchants and theater managers of the city to secure their help in pushing the pass as a producer of the off-peak travel that means so much to them. He also addressed the night and day carmen, explaining the meaning of the pass from both the fare-handling and business-building standpoints.

Mr. Walker's suggestion that they be placed on a commission basis met such a cordial response that a number of operators said they would do more than sell passes on the card—they would offer them to their neighbors in their off hours.

The local papers which were represented at these meetings have published good accounts of the pass, so that the pass is already a matter of general knowledge, even in advance of the advertising campaign prepared for newspaper and car window use. The company hopes to put on pass No. 1 for the week beginning May 1.

Boise Revenue Gains in Second Week

The second week of the 7-cent cash fare on the Boise (Idaho) Street Car Company and the Boise Valley Traction Company shows an increase in passengers and revenue over the first week of the new rates. The first week showed a falling off in traffic and receipts as compared with the last week of the lower fares. During the second week the Boise Street Car Company carried 698 more passengers than during the first week, and collected $30 more in fares. As compared with the corresponding weeks in February, the first week of the new rates showed a decrease of $106 on the Tenth and Eighteenth Street belt lines of the Boise Valley Traction Company in revenue and of 3,705 in passenger traffic, while the second week showed a revenue decrease of $61.79 and passenger decrease of 2,668. The South Boise line during the first week of the new fares reported a decrease, as compared with the last week of the old schedule, of $27 in revenue and 686 in passengers. For the second week it reported an increase of thirty-eight in passenger traffic and $9.08 in revenue over the corresponding week in February. The announcement of new rates was given in the ELECTRIC RAILWAY JOURNAL, issue of April 8.

Fare Increase Sought in Mobile

The Alabama Public Service Commission has under advisement a petition of the Mobile Light & Railroad Company for an increase in fares. The company has requested the right to charge an 8-cent cash fare instead of the present 7-cent one and an increase in the ticket rate from 6 to 7 cents. At present four tickets are sold for 24 cents.

Opposition to the proposed increase was registered with the commission by the city of Mobile. A request was made that the old contract rate of 5 cents be re-established. This contract was suspended as an emergency measure about two years ago to permit the company to charge the present rates, to meet the increased costs to which it was then subjected. The Mobile Light & Railroad Company now contends that not only have costs failed to be reduced, but that losses in traffic and the suspension of shipbuilding activity at the Chickasaw plant have created losses in revenue which if continued throughout the present year will cause a deficit of $162,700.

The commission has determined to have a valuation of the property made before rendering a final decision on rates. The commission's own engineers will value the property. The company has already had a valuation made on its own account. According to report, this valuation showed that the property had cost a minimum of $4,050,000, and that it would now cost $6,506,000 to reproduce.

One of the appraisals of the properties of the Mobile Light & Railroad Company is being made by the firm of Harry Barker & Robert C. Wheeler of New York City and Albany, N. Y., working in connection with Capt. Charles T. Long, the company valuation engineer. The field work is being done by a force of about fifteen under the direction of Capt. Harry Barker, who will present the results before the Alabama Public Service Commission. The commission engineer, L. M. McDonnell, is making a concurrent check and appraisal.

Railway Loses Fare Suit

In an opinion by Justice Brandeis the United States Supreme Court recently decided against the Galveston (Tex.) Electric Company in its suit to enjoin the city of Galveston from putting into effect a 5-cent car fare. The company contended that this rate was confiscatory. The District Court for the Southern District of Texas denied the injunction on the ground that it had no right to interfere with the fixing of rates, which was a legislative function, unless it appeared beyond doubt that the rates would deny just compensation, which it was not convinced was shown in this case.

Transportation News Notes

Children's Fares to Be Reduced.—Officials of the Pine Bluff (Ark.) Company have announced that they are working on a plan for reduction of the fares charged school children. A reduction to 3 cents has been asked, and the officials state that it is probable that a reduction to less than 3 cents will be made.

Freight Rates Reduced 16 and 20 per cent.—Freight reductions of 16 and 20 per cent, effective April 10, have been announced for the electric lines of the Cleveland, Southwestern & Columbus Railway, Columbus, Ohio. This will make the rates equal to those prevailing on steam roads. E. L. Hukill also announced a similar reduction for the Columbus, Deleware & Marion Electric Company, effective April 20.

Reduced Rates Announced. — The Western Light & Power Company, Boulder, Col., through its general manager recently announced a reduction in railway fares approximating 20 per cent. This step was voluntary on the part of the company to induce more people to ride. Single rides will be 10 cents, the present rate; strips of seven tickets can be bought for 50 cents and books of twenty rides will be sold for $1.25 instead of $1.50.

Seek Lower Rates.—Six separate petitions have been presented to the City Council of Fort Smith, Ark., by 370 citizens of that city asking that the Council order the Fort Smith Light & Traction Company to reduce its trolley fares from 7 to 5 cents. The petitions call for transfers and half fares for children. The Council has set April 13 as the date for a hearing. It is said that the petitions were circulated shortly after the platform men employed by the traction company accepted a cut in wages of 6 cents an hour. The negotiations lasted for five weeks, ending with the men signing the only contract offered by the company.

Fares Reduced on Grays Harbor Lines.—A fare reduction from three tickets to four tickets for 25 cents has been ordered by the Department of Public Works of Washington, on all lines of the Grays Harbor Railway, Light & Power Company. This railway serves Hoquiam, Aberdeen and Cosmopolis. The reduction is for an indeterminate trial period. Cash fares continue at 10 cents. The reduced rate is effective April 30. Trial of 10-cent cash fare and three tokens for 25 cents resulted in a loss to the company, but with the lower fare the company hopes that increased patronage, particularly in intercity traffic, will more than make up for the reduction. One-man cars and other operating economies have been instituted by the company. This matter has been referred to previously.

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New Publications

Fire Tests of Building Columns

By the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters and the Bureau of Standards. 389 pages, illustrated.

This bulletin reports the results of an experimental investigation of the resistance of building materials and loaded columns when exposed to fire or to fire and water, with the record of characteristic effects.

Bibliography of Petroleum and Allied Substances (1918)

By E. H. Burroughs. Bulletin No. 189. United States Bureau of Mines, Washington, D. C.

This bulletin contains a complete list of all material appearing in periodicals during 1918 on the subject of petroleum. The references are classified according to the Dewey system and a short résumé of each article is given.

Motor Truck Transportation

By F. Van Z. Lane. Published by D. Van Nostrand Company, 8 Warren Street, New York.

This book is a summary of the principles governing the success of motor truck transportation, practically all the space being devoted to freight carrying vehicles. Operating costs, motor truck vs. other modes of transportation, bodies and other load carrying equipment, are all discussed in a general way. The author is the lecturer on motor truck transportation at New York University.

Signaling on the Berlin Elevated and Underground Railways

Published by Julius Springer, Berlin, Germany. 188 pages; illustrated.

This gives a very complete description of the types of signals and signal equipment together with methods of installation with circuit diagrams for the Berlin (Germany) Elevated & Underground Railways; also similar information for the London Underground and New York subways. It puts in permanent form information not available elsewhere.

Railway Statistics of the United States for 1920

By Slason Thompson, Bureau of Railway News and Statistics, Chicago, Ill.

This is the eighteenth year that Mr. Thompson has published his little book of statistics of the railroads in this country and abroad. The data relate not only to rolling stock, mileage and finances for both American and foreign roads but to many allied topics. The book contains 147 pages and will be found very useful for any one looking up group statistics of the steam railroads. Many of these are in comparative form. Editorial comments accompany many of the figures given.

American Electricians' Handbook

By Terrell Croft, consulting engineer. Second Edition, Published by McGraw-Hill Book Company, Inc., New York. Cloth 7 x 4¼ in. 789 pages. 900 illustrations.

A second edition of American Electricians' Handbook, by Terrell Croft, has been published by the McGraw-Hill Book Company, Inc. This popular handbook has been found very useful by practical electricians, and is particularly noted for its clear explanations and good illustrations.

Effect of Moisture Content on Concrete

A Study of the Effect of Moisture Content Upon the Expansion and Contraction of Plain and Reinforced Concrete. By Torata Matsumoto. Bulletin No. 126 of the Engineering Experiment Station, University of Illinois, Urbana. Sent upon request.

This study contains some of the results of experiments made by the author, who did graduate work in Theoretical and Applied Mechanics at the University of Illinois in 1918. He was for many years an engineer on harbor work in Formosa and wished to determine the lasting qualities of concrete in a damp and tropical climate.

Sistema de Alimentazione Della Linee a Trazione Elettrica a Corrente Continua

By Enrico Sorelli, Brescia. 46 pages, paper.

This pamphlet describes the transmission system for direct current electric railways devised by Mr. Sorelli, an Italian engineer. The purpose of this system is to reduce the number of converting substations and centralize the distribution of energy by the use of a system of double feeders at different voltages. He states that by the use of his system the tension is equalized throughout the line and that the drop is reduced to very small fraction.

The most interesting feature of the booklet is a technical description of conditions on the Gardone-Travernole electric railway where his system is in use.

Federal Power Commission Report

Government Printing Office, Washington, D. C., 1921

The first annual report of the Federal Power Commission, which covers the fiscal year ended June 30, 1921, has been published. The report states that the commission's jurisdiction is limited to the consideration of projects designed to produce water power; further, that the body has the authority to grant permits or licenses for constructing, maintaining and operating which have previously been approved by the International Joint Commission. On Nov. 1 the commission had received 260 applications which aggregated 11,060,000 primary horsepower and 16,826,000 hp. of estimated installation. The applications affected thirty-three states, the District of Columbia and the territory of Alaska. This estimated installation is approximately twice the horsepower so far developed in the United States.

The Federal Power Commission consists of the Secretaries of War, the Interior and Agriculture, and O. C. Merrill, who is executive secretary.

Legal Notes

CALIFORNIA—*Ejectment not Proximate Cause of Injuries Sustained More than ¾ Mile from Place of Ejectment.*

A railroad was not liable for injuires to person on the track on the theory that it had negligently ejected him for failure to produce a ticket or fare, though he was in a helpless condition as a result of intoxication or other causes, where injuries were sustained three-fourths of a mile from the place of the ejectment, the ejectment in such case is not the proximate cause of the injuries. [Lammers vs. Pacific Electric Ry., 199 Pacific Rep. 523.]

FEDERAL COURTS—*Payment of Interest into Special Fund Held to be a Contract Requirement.*

Where a city, in an ordinance authorizing the issuance of bonds, irrevocably obligated itself to pay into a special fund from the gross revenues of its street railway system before each installment of interest falls due a sum equal thereto, and requiring the city treasurer one month prior to this interest date to set aside the amount thereof, the provision for setting the interest aside is part of the contract obligation binding on the city and not merely a directory provision. [Puget Sound Power & Light Co. vs. City of Seattle et al., 271 Federal Rep. 958.]

GEORGIA—*Company May Reassign Seats in Carrying Out Jim Crow Law.*

Where a State law requires the separation of white and colored passengers in street cars, a conductor has the right not only to assign a seat at the time a passenger enters the car, but to make such necessary reassignments as the exigencies of the traffic may require. [Savannah Electric Co. vs. Lowe, 108 Southeast Rep. 313.]

MASSACHUSETTS—*Conditions Precedent to Becoming Passenger.*

Any one in proper condition, who takes hold of the grabhandle, places his foot on the step and begins to enter a car is a passenger, if the car is at a regular stopping place in the street for the purpose of receiving passengers and persons were invited to enter and become passengers. [Franz vs. Holyoke Street Railway, 132 Northeast. Rep. 270.]

MICHIGAN—*City Has Power to Oust Railway on Expiration of Franchise.*

The Common Council of Detroit under the charter of the city has power to exercise control over the use of its streets and to direct the institution of a suit to oust a street railway company from the streets as to which its franchises from the city have expired. [City of Detroit vs. Detroit United Ry., 184 Northwest Rep. 516.]

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MISSOURI—*Excessive Speed Not Necessarily Cause of Accident.*

Negligence not being actionable unless it produces an injury, an instruction authorizing recovery must require a finding that the negligence complained of was the proximate cause of the injury. Hence, in an action for the death of a pedestrian struck by a street car, an instruction that if the car was being run at a speed greater than 15 m.p.h. and the deceased was exercising ordinary care for his own safety, the company would be liable, was erroneous as not requiring a finding of specific and definite facts, from which it necessarily followed that the negligence was the cause of the injury. [Lackey vs. United Railways 231 Southwest. Rep. 956.]

MISSOURI—*Street Railway Held Not Negligent in Maintaining Defective Grabhandle.*

A street railway could not be held negligent for maintaining a grabhandle on a street car which contained a defect not discoverable except by breaking the brass casting holding the rail, where the grabhandle was inspected from time to time by stepping on the step and jerking on it, as far as injuries to one not a passenger was concerned. [Galloway vs. Kansas City Rys., 223 Southwest. Rep. 385.]

MISSOURI—*Denial by Commission of Railway Company's Right to Issue Bonds Held Impairment of Contract Right.*

Under the terms of a railway company's mortgage it has the right to issue bonds to cover additions and extensions upon showing net earnings double its interest charges; when, however, it proposed to issue bonds on additions it was found that part of the expenditures were made more than five years prior to its application to the Public Service Commission for authority to issue such bonds, the delay in making such application being due to the fact that the company could not show the requisite net earnings prior to its application. By the Public Service Act of the State, the commission is prohibited from authorizing the issuance of bonds for additions made more than five years prior to the application. Nevertheless the court held that the application should be granted in spite of the law, because otherwise the law would be unconstitutional, as impairing the company's contract right to issue such bonds, contrary to Const. U. S. Art. 1, Sec. 10. [State ex rel. Joplin & Pittsburgh Ry. vs. Public Service Commission, 223 Southwest. Rep. 388.]

SOUTH CAROLINA—*Place in Street Where Street Car Passenger Alights Is Not a Station.*

A public street in a city, at a point where a street car stops for passengers to alight, is not to be regarded as a passenger station, in determining the duty of the company toward its passengers, and a passenger who stepped on a banana peel and fell cannot recover. [Thompson et al. vs. Greenville Traction Co., 107 Southeast. Rep., 911.]

Personal Mention

J. A. Crilly Has Long Service

"I hope John A. Crilly will be with the Connecticut Company many more years," declared Nathaniel J. Scott, manager of the Hartford Division, in commenting upon the fifty-seventh anniversary of Mr. Crilly's service, which was celebrated April 7. Mr. Crilly entered the company's ranks in 1865, when it was known as the Hartford & Wethersfield Horse Railway, and for many years was chief claim adjuster. Since 1916, when he retired from this position, he has been doing special work for the company.

Mr. Crilly's first work with the company was taking care of horses at $8 a week. Even his next work was still somewhat distantly removed from modern electric railways, for he did the blacksmithing for the company. He became yard foreman, and when the company changed from horse cars to electric apparatus Mr. Crilly was in charge of selling the horses. He sold 750 and is proud of his record. Thereafter he was acting superintendent, by appointment of President E. S. Goodrich, until 1895, when he became chief adjuster. He was succeeded in that work by his son, John A. Crilly, Jr.

The service record of Mr. Crilly is excelled by few others in the country.

Los Angeles Railway Makes Changes

Changes in the auditing department of the Los Angeles (Cal.) Railway have been announced. O. J. Hastings becomes assistant auditor. He was formerly chief clerk. This position has been filled by G. W. McDonald. H. E. Gaskell has been appointed chief accountant and statistician, and S. J. Nock head bookkeeper and accountant.

George E. Falk, formerly safety director for Henry L. Doherty & Company, with headquarters at their New York office, has been assigned to the Community Traction Company and the Toledo Edison Company, at Toledo, as head of all the safety work. He plans a general all-year campaign on "safety" and has already secured the co-operation of the Toledo Automobile Club and the public schools in an effort to put over a safety course through the public schools. Mr. Falk has been with the Doherty interests for nine years. He started in the gas offices of subsidiaries in New York State.

George P. Good, who has served for many years in the transportation department of the Philadelphia (Pa.) Rapid Transit Company, has been appointed superintendent of transportation. Elbert G. Allen has been appointed chief engineer. Mr. Good started work with the company twenty-eight years ago, when cable cars were still used. Mr. Allen, a graduate of the Massachusetts Institute of Technology, was associated in an advisory capacity with Stone & Webster in the construction of Hog Island. His appointment has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

Obituary

Howard E. Huntington

Howard Edward Huntington, vice-president of the Los Angeles (Cal.) Railway and only son of Henry E. Huntington, president of the company, died March 27 at the age of forty-six.

Private burial service was conducted on March 29 and as a mark of respect all trolley cars in Los Angeles stopped for one minute at 10 a.m., the time of the funeral. All machinery, except substation motors, was stopped for five minutes and the main offices closed for half a day.

Mr. Huntington began his railway career in 1894 with the late Epes Randolph, builder of the Southern Pacific Railway of Mexico. In 1903 he began his actual experience in Los Angeles traction activities as a worker in the electrical department of the shops.

Upon the death of J. A. Muir, then general manager, Mr. Huntington was appointed to the position.

He continued as active head of the railway until 1911 when he made a trip to Europe for his health. He retained the title of general manager until 1918, when George J. Kuhrts, the present general manager, was appointed. During the war he served as a dollar-a-year man with the shipping board and supervised important phases of shipbuilding work at Los Angeles Harbor and Oakland, Cal.

Knox Taylor, president of the Taylor-Wharton Iron & Steel Company, and vice-president of the American Railway Business Association, died April 4, at his home in High Bridge, N. J. During the war his company aided in supplying railway track material for use abroad, and he himself was the representative of the leading manufacturers of this product in dealings with the Government. Mr. Taylor worked through all the departments of the Taylor Iron & Steel Company, and finally became president. In 1912 this company purchased the William Wharton, Jr., & Company, Inc., and the Philadelphia Roll & Machine Company, and Mr. Taylor became president of the new Taylor-Wharton Iron & Steel Company. The Taylor and Wharton Companies had originated the use of manganese steel in trackwork.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

New Electric Line Planned for Florida

Sanford, Fla., suburban trolley lines linking up Sanford (Fla.) and intermediate points south to Plant City, where it is confidently expected the Tampa Electric Company will meet it, is the plan being promoted by Frank J. Ryan, vice-president of the Orland Mortgage & Loan Company, and F. F. Ange, president of the Bank of Orange, Orlando, Fla. The proposed lines would provide a scenic route through Florida linking with the St. John's River north from Sanford so as to appeal to the tourists. Orlando would be headquarters and the route would include Winter Park, Orlando, Kissimmee, Loughman, Haines City, Lake Alfred, Auburndale, Lakeland and Plant City, with spurs out of Orlando to Daytona and Tavarese. It would offer competition to high freight rail rates by a joint trolley and water rate to Jacksonville and an all-trolley rate to Tampa and Orlando, the three principal consuming centers of the region. One of the biggest lumber mills in the south is at Loughman and its owners are understood to be interested in the project. Mr. Ryan's estimates are that it will require $12,000,000 to lay the lines and equip the various companies which would operate over the tracks. Mr. Ryan states that negotiations have progressed with Northern financiers far enough to practically assure consummation of the project.

Ohio Road Will Buy Power

Indiana, Columbus & Eastern Traction Co., Springfield, Ohio, will operate cars with power furnished by the Dayton Light, Heat & Power Co. not later than June 1, according to a statement issued today by G. D. Nicoll, superintendent of power equipment for the road. At present the company is supplying its own power, but the contract with the Dayton company will furnish service cheaper than the traction line can produce it, company officials say. New rotary converters are being installed at the various substations and new substation buildings are being constructed at Medway on the Dayton-Springfield division and at Donovan's Hill on the Springfield-Lima division. Operation of the power plant at Medway will stop as soon as the Dayton service begins and it is regarded as probable that the plant will be entirely demolished, although some of the executives are said to favor the retention of the plant for emergency purposes. The Dayton service will be transmitted at 33,000 volts, the same as at present, but with alternations at 60 cycles instead of 25. It was this change which required the installation of new converters. The contract between the traction line and the Dayton company was recently approved by the State Public Utilities Commission.

Orders for 151 Safety Cars Placed

The Stone & Webster Company recently placed orders for 136 Birney safety cars. Of these eighty-nine were ordered from the St. Louis Car Company and forty-seven from the American Car Company. These cars will be used as follows: Houston, Tex., 35; Columbus, Ga., 3; Savannah, Ga., 30; Tampa, Fla., 24; Pensacola, Fla., 8, and Jacksonville, Fla., 36.

In addition to these the Chicago, South Bend & Northern Indiana Railway has placed an order for fifteen safety cars with the J. G. Brill Company.

Advice on Foreign Market Conditions

A feature of the ninth National Foreign Trade Convention in Philadelphia, to be held on May 10, 11 and 12, will be the furnishing of trade advisers to give information on foreign trade questions. These advisers have been selected from business men who have spent years in foreign trade and they will furnish information regarding market, shipping, finance, sales and advertising methods, and other items considered as obstacles to entering foreign markets.

Westinghouse Air Brake Report

The Westinghouse Air Brake Company earned $1,412,490 net during 1921. This was exclusive of loss due to shrinkage in inventory prices, amounting to $2,307,854, charged against reserves created for that purpose. With this adjustment the inventory stands at $10,802,328, as compared with $15,628,811 on Dec. 31, 1920. In commenting on the general situation the officers say:

"As outlined in our last annual report for the stockholders, we entered the year 1921 with a fair volume of unfilled orders on hand, and as a consequence our shipments for the first quarter were fairly satisfactory; but on account of the general business depression and particularly the curtailing of purchases by the railroads of the country, our orders received during the year under review amounted to less than 50 per cent of normal, which resulted in plant operation and shipment for the year of approximately this same percentage. Under existing conditions, it would be difficult and useless to endeavor to forecast the future."

San Francisco Car Contracts Awarded

Contracts were awarded on April 4 for twenty new cars for the San Francisco Municipal Railways. The contracts are for the construction and assembling of cars of the center entrance type, at a cost of almost $200,000. The bids accepted, according to City Engineer M. M. O'Shaughnessy, are approximately $1,200 cheaper per car than the estimate made several months ago. The contract for the body and trucks went to the American Car Company of St. Louis at $5,187 per car; trucks and wheels to the same company at $1,312.50 per car. The Westinghouse Traction Brake Company was awarded the contract for the air brakes, the total contract being for $11,363.73. The Westinghouse Electric & Manufacturing Company was given the contract for the electrical apparatus, motors, etc., the contract totaling $49,503.66.

General Electric Submits 1921 Report

The thirtieth annual report of the General Electric Company, Schenectady, N. Y., reports orders received in 1921 were $179,722,000, as compared with $318,470,438 for 1920. For the first quarter of 1922 orders received have been at an annual rate in excess of $200,000,000. Net sales billed were $221,007,992, compared with $275,758,488 for 1920. A surplus in excess of cash dividends for the year 1921 was $8,243 290. C. A. Coffin, chairman of the board of directors, in a statement to the stockholders, characterized 1921 as an exceptionally trying and difficult year "with its contraction in business and the unavoidable processes of readjustment."

The report states that inventories in factories and warehouses and on consignment have been taken with the usual care and valued in accordance with the custom of the company at cost or market, whichever is lower. Investment securities have been carefully revalued according to the statement and a reserve of $3,700,000 has been established to safeguard the company's interest in associated manufacturing and selling companies against inventory or other shrinkage. They are now carried at a net value of $75,326,382.

Metal, Coal and Material Prices

Metals—New York	April 11, 1922
Copper, electrolytic, cents per lb.	12.875
Copper wire base, cents per lb.	14.125
Lead, cents per lb.	5.05
Zinc, cents per lb.	5.25
Tin, Straits, cents per lb.	30.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4 60
Somerset mine run, Boston, net tons	2.10
Pittsburgh, mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	2 625
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.90
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	84.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	88.00

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Rolling Stock

Columbus, Delaware & Marion Electric Company, Columbus, Ohio, contemplates the addition of one more freight car owing to increase in business.

Houston (Tex.) Traction Company plans to purchase immediately thirty-five new cars at a cost of $270,000, according to an outline of the company's proposed improvements submitted to the City Council by Luke C. Bradley, district representative of Stone & Webster. Mr. Bradley also told the City Council that the company will paint and overhaul thirty-six cars it now owns that have been in the carhouses unused for some time.

Chicago (Ill.) Surface Lines expect to be in the market very soon for 100 new cars. Of these, seven will be trailers to replace the trailers burned in the Devon carhouse fire which occurred in January. The others will probably be of the double-truck one-man safety type, like the sample recently built and described in the ELECTRIC RAILWAY JOURNAL for Jan. 14, 1922. The insurance money received for the cars destroyed in the Devon fire is sufficient to finance a large proportion of these new cars.

Track and Roadway

Houston (Tex.) Electric Company has begun to double track its line on Lorraine Street from Gano to Maury Streets.

Pennsylvania & New Jersey Railway, Trenton, N. J., is placing a new curve in the road at Hulmeville, Pa., and otherwise repairing the road in that section.

Municipal Railway of San Francisco received bids on March 29 for track construction on Liberty Street between Church and Sanchez. The cost of the work will be approximately $60,000.

Indiana Service Corporation, Fort Wayne, Ind., will soon start work on the double tracking of the West Main Street line, according to S. W. Greenland, vice-president and general manager. The franchise for this work was granted last year.

Michigan Railway, Kalamazoo, Mich., will start work on its $100,000 improvement program just as soon as warm weather comes. The principal item calls for the relaying of track on Portage Street from Washington Avenue to Lovell Street.

Public Service Railway, Newark, N. J., through Harry C. Stevenson, its representative, has informed the Haddonfield, N. J., city officials that the corporation will make repairs in King's Highway in the early spring. Mr. Stevenson made this announcement after an inspection of the road.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill., has announced through its president that it will extend its interurban line from Carbondale to Herrin, work beginning about May 1. The citizens' subscriptions to the preferred stock justified the extension.

Harrisburg (Pa.) Railways will probably begin the work about April 1 of improving North Third Street in front of the Capitol and will include paving of the Walnut Street stretch on the south side of the Capitol. The trolley tracks now in Third Street will be shifted to allow for another track and the west side curbing will be moved for widening the sidewalk.

New Jersey & Pennsylvania Traction Company, Trenton, N. J., may be forced to provide additional rails on West Hanover Street. This action is urged so that cars from the Princeton and the Pennsylvania lines can travel on the right hand side of the street. There are two different gages of tracks compelling the cars to travel on the wrong side of the street. The traction company asked that the city cut down the width of the sidewalks instead of putting the corporation to so great an expense. It is said that the cost will amount to about $75,000.

International Railway, Buffalo, N. Y., in co-operation with the city in its plans for repaving city streets, rebuilt during 1921 more than 20 miles of track. The rehabilitation also represents the complete overhauling of 334 cars, renewal of 38 miles of trolley wire and many other improvements and betterments. The expenditure thus incurred, amounting to over $3,000,000, entirely consumed the appropriation made from 1921 earnings for maintenance and renewals and approximately $500,000 of working capital provided by the stockholders.

Memphis (Tenn.) Street Railway, with the Mayor's consent, has made final arrangements for the extension of the crosstown line from Agnes Place to McLemore and the connection of two links in the railway chain on McLemore Street, making a through crosstown route from Poplar and Cleveland Streets to Riverside Park. The company is also making rapid progress in laying its tracks across the Viaduct just erected at McLemore Street over the Yazoo & Mississippi Valley and the Illinois Central Railroad system tracks. The double tracks will first be laid, after which the concrete will be put in. The work is being done under the direction of A. E. Yarbrough of the car company construction department.

Power Houses, Shops and Buildings

Duquesne Light Company, Pittsburgh, Pa., which furnishes power for the Pittsburgh Railways, has authorized the Dwight P. Robinson Company to install two additional boilers of 22,914 sq.ft. of surface and to design and construct additions to the company's high-tension substation.

New Orleans Railway & Light Company, New Orleans, La., will probably erect a new office structure instead of repairing the old building recently damaged by fire. The new building if constructed will be five stories in height and will cost about $500,000. Receiver O'Keefe has had a conference with the security holders on the subject of constructing this new building upon the site of the former quarters of the company.

Philadelphia Electric Company, which supplies power to the Philadelphia Rapid Transit Company, has just placed an order for sixteen 3,750-kva. single-phase transformers for operation at 60 cycles, with a total capacity of 600,000 kva. The total cost of the transformers will be approximately $100,000. The contract for these transformers is awarded to the Westinghouse Electric & Manufacturing Company, and they are to be used in various substations. They are duplicates of approximately thirty similar Westinghouse units now in operation.

Trade Note

Canton Culvert & Silo Company, Canton, Ohio, manufacturers of "Acme" (Nestable) and "Imperial" riveted corrugated metal culverts, was awarded on March 10 the annual contract for supplying the Pennsylvania State Highway Department's requirements for corrugated metal culverts this season. The contract approximates 42,000 ft. of corrugated culverts.

New Advertising Literature

Ohio Brass Company, Mansfield, Ohio. has issued a folder which describes with pictures its Type A-Ear with its improved Under-run type of construction installed.

Sprague Electric Works, New York, N. Y., has issued a circular descriptive of narrow-unit panelboards of the safety type. This panel is an economy in wall space and price.

Stumpf Una-Flow Engine Company, Inc., Syracuse, N. Y., has issued a Lefax sheet describing and giving information regarding the performance of its una-flow steam engine.

General Electric Company Schenectady N. Y. has just issued descriptive leaflets of type LG-116 indoor disconnecting switches and type QC-3 quick-break lever switch.

Electric Power Club, 1017 Olive Street, St. Louis, Mo., has recently published a handbook on controllers for electric motors. This pamphlet contains simple descriptions of controllers and definitions of the terms used in that connection. Words which do not appear in most dictionaries are explained simply.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Volume 59 New York, Saturday, April 22, 1922 *Number* 16

Purchase of Detroit Lines Approved by Voters

MAYOR COUZENS of Detroit will soon be free to put into full effect his idea of how best to run a municipal street railway. At the election there on Monday the voters cast their ballot to sustain him in his effort to municipalize the entire city system. The Detroit United city lines will be taken over at the price of $19,850,000, to be paid with a down purchase of $2,770,000, the rest of the price to be paid in installments. The present municipal system will now be tied in with the lines which the Detroit United has been operating, and the United States will witness the most important experiment in municipal ownership of a city railway system so far made in this country.

Jim Couzens is a big man. He has a genius for getting things done. The wisdom of his ways may be open to question, but there is no controverting the fact that the work of building the municipal road so far constructed during his administration of affairs in Detroit has been carried out with celerity. While he is in office his best efforts will undoubtedly be devoted to the careful management of the road along sound lines. But Jim Couzens is an anachronism in American public life. When the day arrives that he goes out of office Detroit's troubles will begin in earnest. For if Detroit runs true to American political form the likelihood is very remote of that city electing as his successor a man with either his qualifications for office or his determination. It is here that danger lies ahead for Detroit.

Zone Fare Surely Hasn't Hurt San Diego Building!

ONE of the most common and plausible arguments urged against the graduated fare is the real estate man's assertion that it is a sure way toward congestion. Of course, what is worrying Mr. Realtor is that if the electric railway charges a higher fare to the long-haul riders he himself will be deprived of some unearned increment on his land. Be that as it may, San Diego is furnishing an emphatic denial of the congestion argument.

It will be recalled that on Jan. 1, 1920, the San Diego Electric Railway inaugurated a zone fare system in which a universal 5-cent fare was succeeded by a basic fare of 5 cents for either of two zones (inner and outer), while a two-zone ticket could be bought for 7½ cents. The new system was a success from the first, if judged by the fact that both revenue and riders increased appreciably.

Now comes a review of realty developments in San Diego during the first two years of the zone-fare system. According to the San Diego *Union* for March 19, 1922, the number of permits for new residences in 1920-21 was 1,285, against 242 in 1918-19, an increase of 431 per cent. The value of these new residences was placed at $3,232,069, against a value of $724,500 in 1919, a gain of 346 per cent. In January and February of 1922 activity has become even greater, January showing 131 permits for $322,900 of buildings and February 130 permits for $337,025 worth.

These are large figures for a city of 80,000 population. But what will interest the electric railway man most is that about 90 per cent of the building activity in 1920 and 1921 occurred within the outer or 7½-cent-10-cent zone, a fact which is all the more significant because San Diego is a most diffused city with more than one vacant lot at its very core. It may well be that our real estate brethren have had to sell these outer zone lots for a bit less than if they were reachable by a 5-cent fare, but the record to date surely shows that the congestion argument, so far as San Diego is concerned, is all moonshine.

The Railway Vocabulary Is Enriched

WHEN a great need develops in the industrial field, some inventor usually rises to the occasion and produces the device or machine required. It is the same with the English speech. If there is a real demand for a word or phrase to express an idea, it will be coined by some one and become a recognized part of the language. A notable instance was the word "interurban" as applied to an electric railway joining two cities.

Last week another expression was first used to describe an electric railway condition, and it promises to be so useful that it also will probably become a part of the electric railway vocabulary. The occasion was a hearing on car loading and service conditions before the New York Transit Commission, the particular point being to determine the number of passengers who had seats during certain hours and those who were obliged to stand.

In most cases of this kind, the presumption to which such testimony leads is that those who stand because they cannot find seats undergo a hardship. The management of the railway company, however, pointed out that, during a large part of the day at least, such passengers suffer no real inconvenience, because they do not have to stand for any considerable length of time. The reason for this is that so many people leave the car at each station that during the non-rush hours most passengers can secure seats after riding a few blocks.

To this class of passenger the representative of the company applied the term "rotary standees." A "rotary standee" may then be defined as a passenger who cannot find a seat the moment that he enters the car, but who within a short time will be able to seat himself in the place made vacant by a departing passenger.

Standees, in railway parlance, can therefore be classified in three ways. First, there is the standee who might be termed the compulsory standee or long distance straphanger. Next comes the rotary standee, whose status has just been defined. Finally, comes the pas-

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senger who stands by preference, either because he prefers an open rear platform to a seat in the middle of a car which he may have to occupy with some disagreeable companion, or because he has baggage which he does not care to take into the car, or because he boards the "car ahead" when there is a vacant seat for him in the car behind, or for some other reason.

It is, of course, generally admitted that railways in large cities cannot supply a seat to every passenger during rush hours, and often not at other times. Even if they could afford to do so, in most cases it would be impracticable because of the impossibility of operating so many cars on the street. Where it is possible it would cost so much that it would greatly increase the average cost of a ride.

Nevertheless, the public should realize that every standee is not what might be described for the purpose of this discussion as a standee by compulsion.

Why the Increasing Interest in the Rail Car?

THERE is something about the rail car, or automotive bus with flanged steel wheels, that appeals to the imagination of the steam railroad and electric railway man. A self-reliant, self-propelling vehicle that can be set on rails anywhere and is immediately ready for business is a transportation tool not to be despised.

Of course the principal field for the rail bus is on light-traffic steam railroad lines or for supplementary local passenger service on steam lines which are primarily devoted to through freight and passenger business. Under such conditions it is necessary to operate steam-locomotive-drawn trains at very low load factor, or to stop through trains at frequent intervals to furnish necessary local service. The flexibility of the rail car adapts it well to such use. Operated in single units it insures a quality of service which will not only care for existing business cheaply but will develop new business.

Obviously the opportunity for this vehicle on steam roads is sufficient to stimulate, through competition, the perfection of its design and construction. The electric railways will profit by this, for while they, even in the aggregate, cannot use many rail cars, they can use some. In the evolution of a new interurban project rail cars might well be employed during a certain period, while traffic is building up. The same is true on roads whose traffic has lightened to an uneconomical point, or whose expected traffic has never materialized.

Granting all of this, one naturally inquires why the rail car has only recently aroused widespread interest. Steam "dummies" were of course used with some success many years ago, but were discarded in the progress of the transportation art. Why take a step apparently backward? This query ignores the fact that the automobile and the automotive bus have in the meantime taken the country by storm. More important yet is the fact that the robust and foolproof truck motor has been made available for the rail car through hard service in a closely allied field. In addition, the hard times in the transportation industry have driven home the fact that its facilities must be co-ordinated in order to move people and goods with facility and economy.

Transportation men are waking to the fact that old equipment and old methods will not pay dividends under modern conditions. Hence, once assured that the rail car is reliable and durable they will use it.

Augusta Learns a Costly Lesson

AUGUSTA has seen the error of her way. After the city had struggled along for a month without electric railway service the city officials met the company's representatives in a spirit of give and take and conceded the attitude of the company to be right, that two systems of transportation cannot exist in active competition on the same street. The lesson was available to Augusta of the dire consequences of unregulated jitney competition in Des Moines and Saginaw, but Augusta, it seems, had to learn at first hand.

From the standpoint of the city, the whole proceeding was a disgrace. The Council had been warned sufficiently in advance of the direction in which events were heading. So far as the members of that body are concerned, the charitable thing, of course, would be to conclude that the Councilmen must have been cognizant of the ultimate result of their attitude, but that they felt called upon to make a demonstration against the railway so as to placate the jitney interests. If this is so, then the city has paid a frightful price in the name of political expediency.

For the company there was nothing else left for it to do but to shut down. In resuming service it has done so apparently against its best judgment and without securing the full measure of protection against the jitneys that would appear to be warranted under the circumstances, but it has returned the cars to service in a spirit of helpfulness, hopeful that the public will respond with a measure of patronage that will permit it to continue operation uninterruptedly. The company is not against the jitney, or jitney service. Its contention all along has been against unfair competition, unfair as manifested most strikingly by the operation of two lines of transportation service on the same street. It ought not to take long to demonstrate whether the measure of regulation under which the cars have been returned in Augusta is sufficient to afford the company the degree of protection necessary for it to operate successfully in the future.

What Do You Do with a Complaint?

ONE electric railway executive who has made a conspicuous success of his interurban railroad never lets a complaint go by as inconsequental. To him every complaint is a matter of important concern. Every complaint represents evidence that the service is not as good as it could be and he takes steps to determine how the cause of that complaint can be removed. His constant endeavor is to do everything possible to cater to the comfort of the passengers. No effort or expense is spared in seeking improvements. Perhaps the worth of this way of treating complaints can be judged by the fact that in the last four years the passenger traffic on this line has increased 40 per cent, the passenger revenue 150 per cent and the freight revenue 1,000 per cent, despite the direct competition of one of the best steam railroads in the country. Of course this policy and effort in connection with complaints is only one phase of a very broad and intelligent program of developing the line and building public esteem, all of which has a bearing on the growth of the business handled. But it bespeaks the general attitude of the whole organization toward the public and the result speaks volumes as to the wisdom of the policy.

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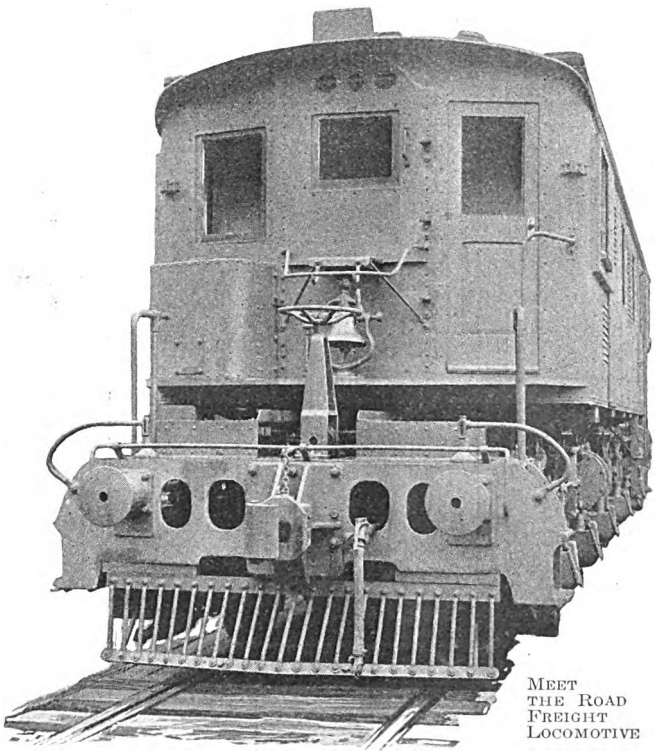
Electric Locomotives for Chile Freight Service

Details of Road and Switching Locomotives Soon to Be Delivered to Chilean State Railways Are Given —Designs Provide for Incorporation Into Present Railway System While Not Preventing Further Standardization

BY F. E. WYNNE
Manager Railway Equipment Engineering, Westinghouse Electric & Manufacturing Company

THE initial electrification program of the Chilean State Railways includes fifteen freight locomotives for road service and seven for switching service. These are in addition to the passenger locomotives, of two types, described in an article in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 25, 1922. The first ten cabs for the road freight locomotives have now been delivered by the Baldwin Locomotive Works to the Westinghouse company for the installation of the electrical and air-brake equipments. On account of the progress which is being made in the production of these machines some details regarding them will be of interest.



MEET THE ROAD FREIGHT LOCOMOTIVE

The service conditions under which the locomotives will operate were covered in articles in the issues of this paper for Dec. 3, 1921, and Jan. 28, 1922. They will be put into service on the main line between Santiago and Valparaiso, 116 miles, and on the branch line between Las Vegas and Los Andes, 28 miles. The heaviest grade is 2.25 per cent, 12 miles long against southbound traffic on the main line from Llai Llai to La Cumbre. In emergency or on holidays these locomotives may be used to operate express passenger trains.

ROAD LOCOMOTIVE SIMILAR TO THAT USED ON PAULISTA

In general design the road locomotive is similar to the freight locomotives furnished to the Paulista Railway of Brazil. The box-type cab is carried on two trucks, articulated, each having three driving axles with direct-geared motors. The estimated weight is 226,000 lb.

A low voltage will be generated on the locomotive for the control circuits, and the system of control is arranged for operation of the locomotive from either end and for multiple operation of two locomotives from any one controller. Regenerative braking also is provided.

The nominal rating of the locomotive is 1,680 hp. at 3,000 volts and the equipment is capable of developing a maximum of 3,200 hp. for short periods. With natural ventilation the locomotive will deliver a tractive effort of 27,950 lb. at a speed of 22.6 m.p.h. at 3,000 volts for one hour with a temperature of 75 deg. C. by thermometer on the main motors. The continuous capacity at 3,000 volts and with forced ventilation is 20,580 lb. tractive effort at 24.8 m.p.h. with a temperature rise of 65 deg. C. by thermometer on the main motors. With 25 per cent nominal adhesion the starting tractive effort is 56,500 lb. The maximum speed is 40 m.p.h. At loads corresponding to the short field continuous current ratings of the motors, running speeds of approximately 6.1, 8.1, 12.8, 16.6, 19.5 and 25 m.p.h. are available.

With any one pair of motors cut out, half of the locomotive capacity is available for starting and two-thirds for running.

The general dimensions and estimated weights of the locomotive are given in Table I.

The salient features of the cab and trucks and many of the details are clearly shown in the accompanying illustrations. The Chilean freight cars now use drawhooks as in European practice. However, it is planned eventually to use M.C.B. standard drawbar equipment on the entire system. Consequently, these locomotives will be equipped with Continental spring buffers and M.C.B. couplers. The couplers are arranged to take attachments for chain couplers during the transition period.

The articulation of the two six-wheel trucks at the inner ends is effected by means of a Mallet hinge. The bar-type cast-steel side frames are located outside of the wheels and are connected by cast-steel bumpers and cross-ties. The oil-tempered steel semi-elliptic driving springs over the journal boxes on each side are connected to one another by equalizing beams. The ends of each set of three driving springs connected thus are attached to the side frames through coil springs.

Rolled steel shapes extending the entire length of the cab and joined by cast-steel and rolled-steel cross members constitute the cab underframe. The cab is of the

TABLE I—DIMENSIONS AND WEIGHTS OF ROAD FREIGHT LOCOMOTIVES

Track gage	5 ft. 6 in.
Length over buffers	49 ft. 10 in.
Length over cab	38 ft. 0 in.
Total wheelbase	37 ft. 0 in.
Rigid wheelbase	13 ft. 9 in.
Height, top of rail to cab roof	12 ft. 7 in.
Height, top of rail to clerestory	13 ft. 10 in.
Width over cab sheets	10 ft. 0 in.
Height of coupler	41 in.
Wheel diameter	42 in.
Weight of complete locomotive	226,000 lb.
Weight of mechanical parts	140,000 lb.
Weight of electrical equipment	86,000 lb.
Weight per driving axle	37,670 lb.

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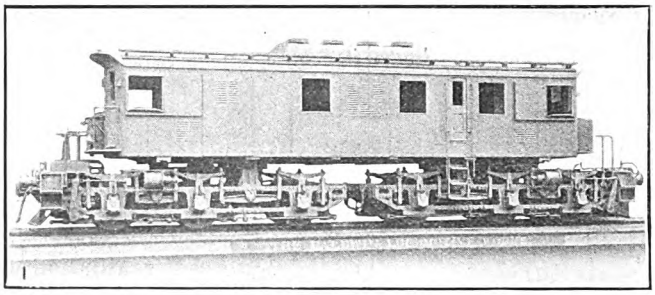
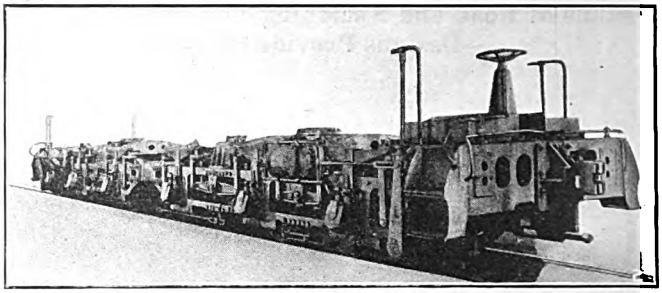
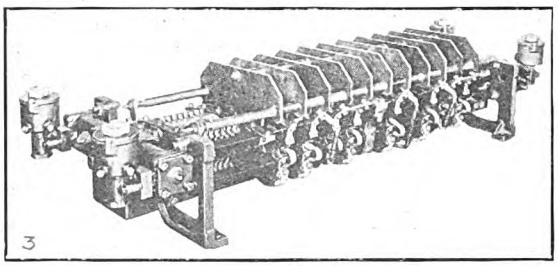
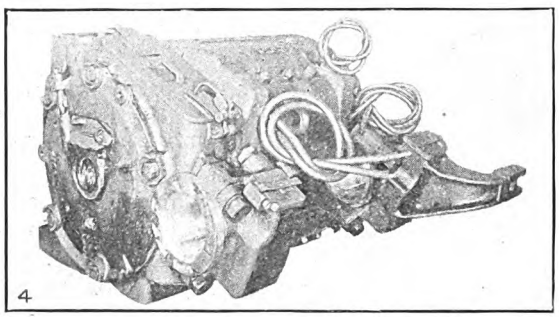
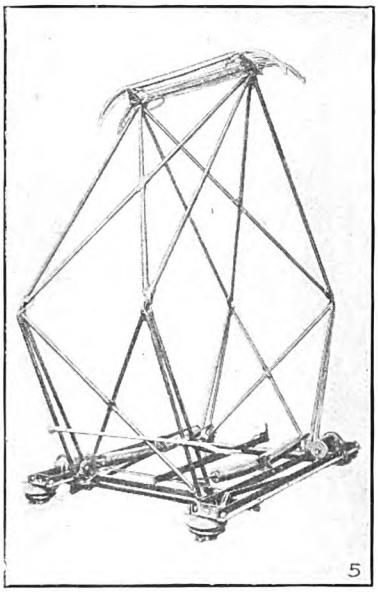
Assembly View of Chilean State Railways Road Freight Locomotive and Some Details of This and the Switcher

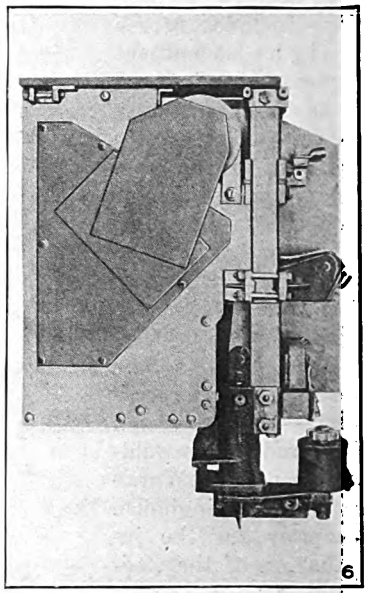


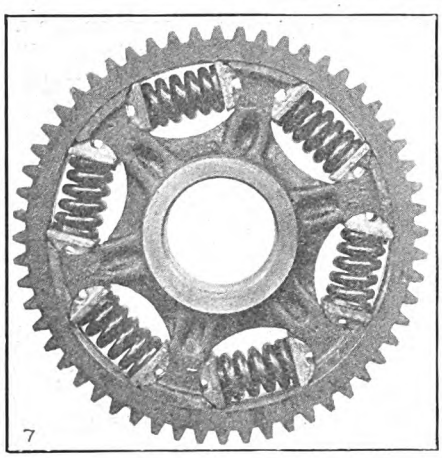












Key to the Illustrations

No. 1—One of the Chilean road freight locomotives.

No. 2—The road freight locomotive trucks are articulated at the inner ends by a Mallet hinge and are equipped with M.C.B. couplers and spring buffers.

No. 3—Cam-operated switches are mounted on a single shaft connected through rack and pinion to a double-acting air piston.

No. 4—The motors are 280-hp. wound for 1,500 volts and insulated to operate two in series on 3,000 volts.

No. 5—Pantographs are spring-raised, air-lowered and mechanically locked in the lowered position.

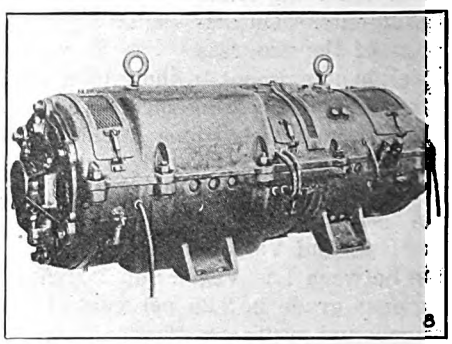
No. 6—One of the 3,000-volt unit switches.

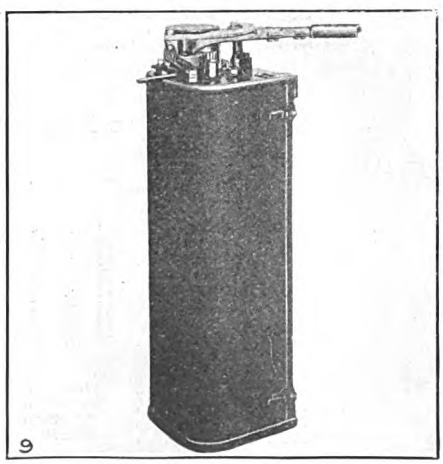
No. 7—Type of flexible gear with which freight locomotives will be equipped.

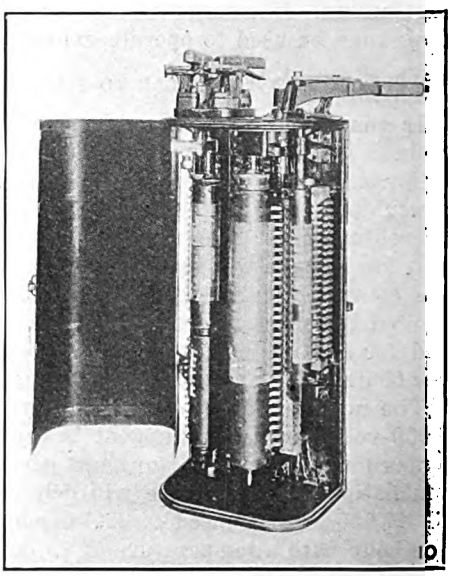
No. 8—The 35-kw. motor-generator set which furnishes low-voltage power supply on the road freight locomotives.

No. 9—The master controller for the switching locomotives has two levers.

No. 10—The master controller for the road freight locomotives has four levers.







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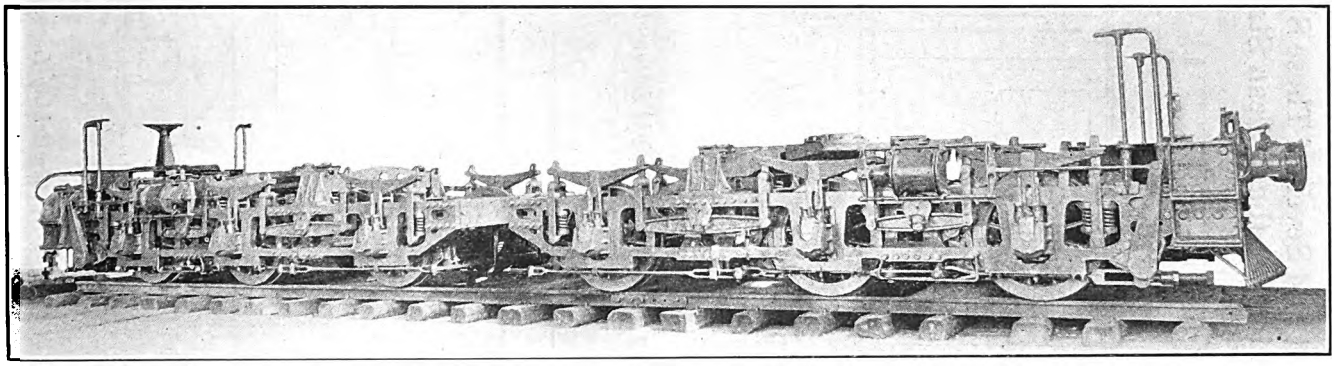
box type, 38 ft. long, and comprises an engineman's compartment in each end and a central equipment compartment. These compartments are separated by bulkheads, in which are doors at each end of each side aisle. The equipment compartment houses the blowers, motor-generator set, air compressors and most of the control equipment. The end doors are in front of the fireman's stations and there is a side door from each aisle. The usual windows, louvers and roof ventilators are provided.

The cab is carried on center pins located approximately over the midpoint of each rigid wheelbase. One center pin is restrained both longitudinally and laterally and the other in the lateral direction only. This permits longitudinal movement of the cab relative to one truck.

The locomotives are equipped with Westinghouse air brakes, which are already standard with the Chilean Railways. The air brake is of the 14-E.L. type, which provides straight air for the locomotive alone and the automatic feature for both locomotive and train. This is of advantage in that the locomotive brakes may be applied either independently of, or in conjunction with, the train brakes.

The air brake is interlocked with the regenerative brake so that the latter may be supplemented by service application of the train brakes, if desired, without applying the air brake to the locomotive drivers. In case a sudden stop is required during regeneration, movement of the brake valve to the emergency position cuts off the regenerative brake and gives an emergency application of the air brakes on both locomotive and train.



TRUCKS FOR ONE LOCOMOTIVE ASSEMBLED AT LOCOMOTIVE WORKS

The pantograph trolleys provided for collecting the current from the overhead are of the spring-raised, air-lowered type, arranged to be mechanically locked in the lowered position. Each has two flexibly mounted shoes with hard-drawn copper wearing strips which can be readily replaced. One trolley is sufficient for regular operation. For safety and to facilitate cutting out a defective pantograph, a double-throw disconnecting switch is mounted adjacent to each trolley. This switch is arranged so that in one position it connects the trolley to the main switch and in the other position it locks the trolley down and connects it to ground.

The main circuit connections are established by a number of individual air-operated switches mounted in several banks, each switch a complete and removable unit in itself. The 3,000-volt unit switch is of the same general design as that which is standard for low voltage.

For certain combination switching where no current is broken and for low-voltage circuits cam-operated switches are used. These also operate by compressed air controlled by electro-magnetic valves. The cam group comprises a number of switches mounted on a single shaft connected through a rack and pinion to a double-acting air piston. The application of air to this piston through the electro-magnetic valves rotates the camshaft, closing and opening the switches in the correct sequence. Each switch is closed by the pressure of a cam on a hardened roller and is opened by spring action. Each cam switch can be removed from its group without disturbing the other switches. These switches are without blowouts, except where they are required to open power current.

Each of the six axles of the locomotive is driven by a Westinghouse No. 350-D 1,500-volt series motor and insulated to operate two in series on 3,000 volts. The nominal rating of this motor on short field is 280 hp., at 155 amp. and 1,500 volts. Field control is secured by the use of two separate field windings on the main poles. During acceleration high starting tractive effort at low speeds is obtained with a current below normal by connecting these two main field windings in series. The full-field connection also provides an additional operating speed for each of the three motor combinations. For the higher operating speed in each combination, only one of the main field windings is effective. High continuous capacity is assured by the forced ventilation provided by two motor-driven blowers.

The motors are geared directly to the axles with a ratio of 3.94 to 1. The sixteen-tooth solid pinion of 2 diametral pitch is cut from a forged steel blank and treated. The sixty-three-tooth gear is of the flexible type, similar in general design to those which have been in successful operation on the Pennsylvania Railroad's Philadelphia terminal electrification for seven years.

For low-voltage supply to compressors, blowers, control equipment and lights a motor-generator set is installed in the locomotive. This has a single frame and the two armatures are carried by a common shaft running in two bearings. The 3,000-volt motor is a bi-polar double-commutator machine. The continuous rating of the generator is 35 kw. at 92 volts.

To provide for double-end operation of the locomotive a master controller is located in each engineman's compartment, the same one being used for both motoring and regenerative braking. This controller has four levers: a reverse lever with forward and reverse positions; a regenerative lever with thirteen notches; a motor combination lever with three positions; a speed lever with sixteen resistance notches, one full-field notch, and one short-field notch. Altogether, fifty control notches are available in acceleration so that tractive effort variations are small, thereby permitting exceedingly smooth handling of trains. All levers of the master controller are thoroughly interlocked.

By means of the Westinghouse HLFR control three

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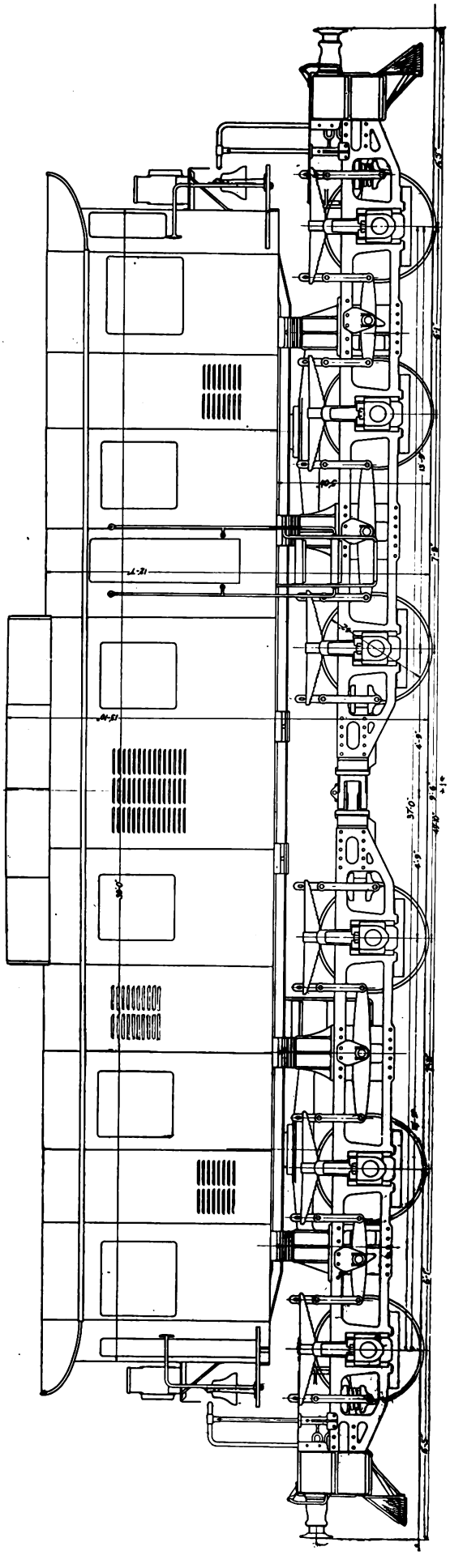
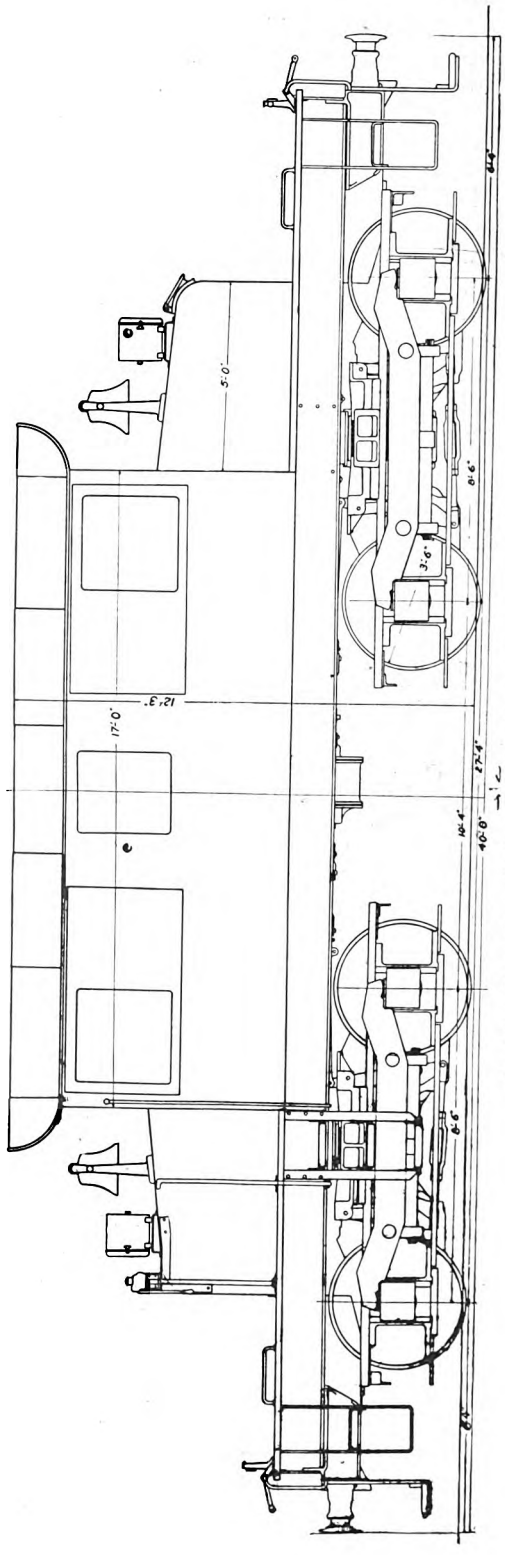
Fifteen of These Road Freight and Seven of These Switching Locomotives Are Under Construction for the Chilean State Railways



Outline Drawing of the Road Freight Locomotive



Outline Drawing of the 560-Hp. Switching Locomotive

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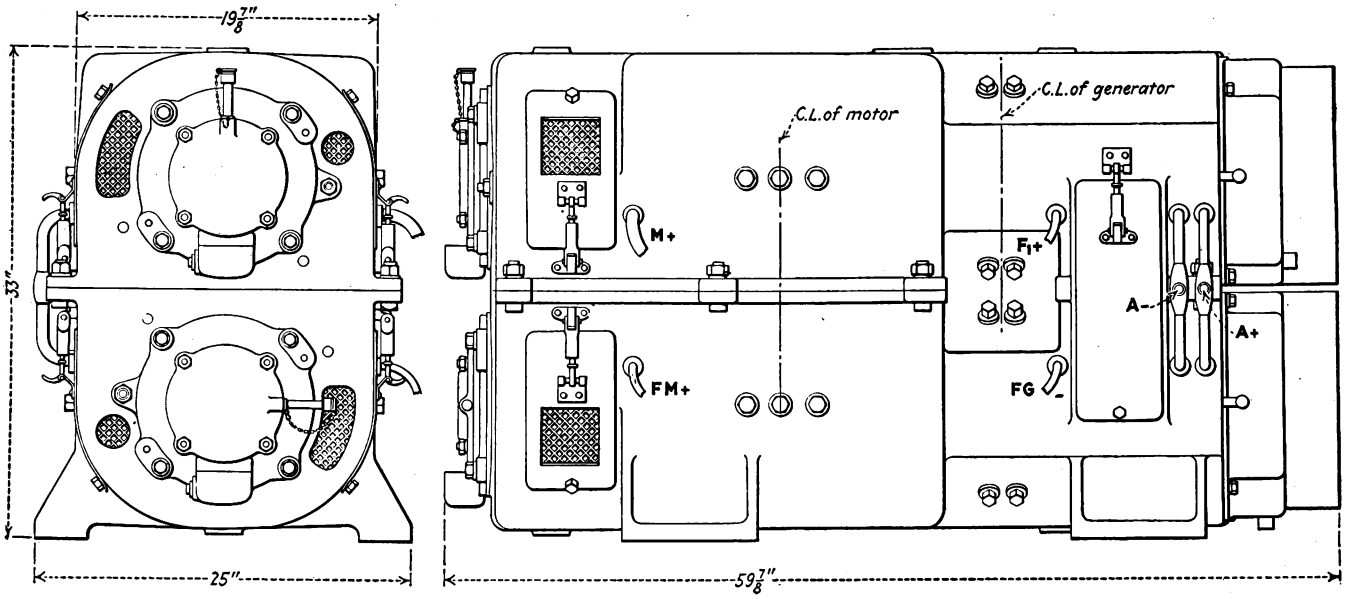
speed combinations will be obtained by varying the grouping of the motors. With all six motors in series one-third speed will result. Two parallel groups, each comprising three motors in series, give two-thirds speed. On full speed three groups, each of two motors in series, are in parallel. All motor main fields are connected next to ground, the voltage stresses on the field windings being reduced thereby. The double-field winding on the motors, giving a full-field and a short-field position for each motor combination, provides a total of six running speeds. Transition from one motor combination to another is by the shunting method.

For regenerative braking, the main motor armatures are arranged for the same combinations as when motoring, and the motor fields are separately excited by the motor-generator set. The arrangement is such that the same voltage is impressed on all field circuits. This tends to produce the same generated voltage in each series group of armatures and assures equal distribution of the load among the motors. Stabilizing resistors are used to equalize the resistances of the parallel field circuits. Both the exciting current and the generated current flow through these resistors. Any tendency of one group of armatures to generate more than its proportion of the current decreases the field current of that group and correct division of load is automatically restored. The range of speed in regenerative braking will be from 8 to 30 m.p.h.

Adequate provision for effective opening of the high-voltage circuits is secured by inserting the main resistance in the circuit prior to the final break at the line switches. This is done whenever the main motor circuit is opened, whether through manipulation of the master controller or under action of the overload relay.

TABLE II—DIMENSIONS AND WEIGHTS OF SWITCHING LOCOMOTIVES

Track gage	5 ft. 6 in.
Length over buffers	40 ft. 0 in.
Length over central cab	17 ft. 0 in.
Length over hoods	27 ft. 0 in.
Total wheelbase	27 ft. 4 in.
Rigid wheelbase	8 ft. 6 in.
Height, top of rail to cab roof	12 ft. 3 in.
Width over cab sheets	10 ft. 0 in.
Height of couplers	38 1/4 in.
Wheel diameter	42 in.
Weight of complete locomotive	136,000 lb.
Weight of mechanical parts	86,000 lb.
Weight of electrical equipment	50,000 lb.
Weight per driving axle	34,000 lb.



THE 22.5-KW. MOTOR-GENERATOR SET WHICH FURNISHES LOW-VOLTAGE POWER SUPPLY ON THE SWITCHING LOCOMOTIVES

SWITCHING LOCOMOTIVES ARE LARGELY STANDARD

The switching locomotive is similar in general design to Baldwin-Westinghouse standard Class D locomotives. The cab is of the steeple type and is carried on two swivel trucks. On each two-axle truck are mounted two motors driving direct through standard helical gears. The estimated weight is 136,000 lb. The control is arranged for double-end operation.

The nominal rating of the locomotive is 560 hp. With 3,000 volts at the locomotive and natural ventilation of the motors the tractive effort for one hour is 19,600 lb. at 10.6 m.p.h., and the continuous capacity is 11,400 lb. at 12.7 m.p.h. With 25 per cent nominal adhesion the starting tractive effort is 34,000 lb. The maximum speed is 35 m.p.h. For short periods the equipment is capable of developing 1,000 hp. At loads corresponding to the continuous current rating of the motors, the speed will be 5.9 m.p.h. in series and 12.7 m.p.h. in series-parallel. With one pair of motors cut out, 50 per cent of the locomotive capacity will be available for starting and for running.

Table II gives the general dimensions and estimated weights of the locomotive.

This locomotive will be capable of handling, in yards with level tracks, trains of 1,200 short tons. This capacity, though in excess of that required for serving the initial trains of 770 short tons, is desirable to provide for the expected increase in traffic.

The trucks are of the rigid-bolster equalized type with rolled steel frames located outside of the wheels. A center pin is located at approximately mid-length of each rigid wheelbase. The central cab has an engineman's stand in each end and control apparatus centrally located and suitably protected. Buffers, couplers and air-brake equipment are duplicates of those on the road locomotive.

The control equipment comprises apparatus similar to that already described for the road locomotives.

The four Westinghouse No. 350-D-2 motors are of the series type, wound for 1,500 volts. This motor has an hour rating of 140 hp., at 79 amp. and 1,500 volts. The pinions have sixteen teeth, 2 D.P., and the solid helical gears have sixty-three teeth.

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The motor-generator set has a two-part frame, each part containing two bearings in which runs a common shaft carrying two armatures, one a 1,500-volt motor (insulated for operation two in series at 3,000 volts) and the other a low-voltage generator.

The motors are connected in series for 3,000-volt operation and the generators are in parallel. With 3,000 volts applied to the motors, the generators will deliver 22.5 kw. at 92 volts. The set supplies power for the compressor motor, lights and control circuits.

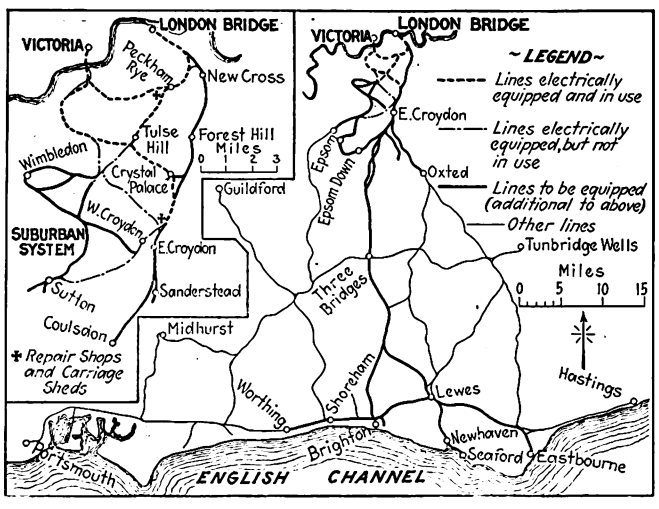
A master controller is mounted in each end of the central cab, each with a reverse lever with forward and reverse positions, and a speed lever for accelerating. A total of nineteen notches are available in operation. Shunting transition is used.

Further Electrification Promises Congestion Relief

SIR PHILIP DAWSON and the officials of the London, Brighton & South Coast Railway, England, have recently made an investigation as to the possibilities of extending electrical operation on its lines. This study,

Location	Service		Percentage Increase in London Trains	Percentage Increase in All Trains, Loaded and Empty
Victoria.....	Main Line.	Electric over steam.....	220	152
London Bridge..	Main Line.	Electric over mixed steam and electric.....	143	58
Victoria.....	Suburban..	Mixed steam and electric over pre-electric all steam	94	100
Victoria.....	Suburban..	Electric over pre-electric all steam.....	225	206
Victoria.....	Suburban..	Electric over mixed steam and electric.....	68	53
London Bridge..	Suburban..	Mixed steam and electric over pre-electric all steam	38	21
London Bridge..	Suburban..	Electric over pre-electric all steam.....	206	86
London Bridge..	Suburban..	Electric over mixed steam and electric.....	121	53

as reported in the *Electrician*, London, showed the desirability of such extension to include not only the outer London suburban area but would reach as far



PRESENT AND PROSPECTIVE ELECTRIFICATION ON LONDON, BRIGHTON & SOUTH COAST RAILWAY

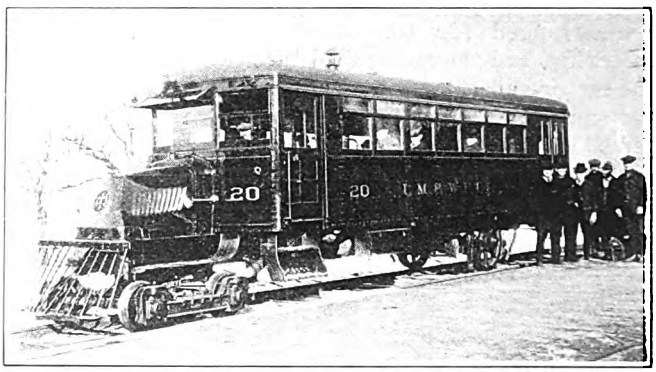
as Brighton, Eastbourne and Worthing. The plan involves the equivalent of 141 single-track miles on the single-phase system in addition to the 70 miles now in successful operation.

The accompanying table shows the estimated benefit from the electrification with respect to train-handling capacity on the congested terminal sections.

Gasoline Rail Car Operated at 40 Cents a Mile

Another Example of the Increasing Popularity of the Single Self-Propelled Unit on Steam Railroad Sections Where Traffic Is Light and Frequent Service Is Appreciated

ON JAN. 1 of this year the Lewisburg, Milton & Watsontown Passenger Railway put into operation a gasoline rail car, which is used in regular service over the tracks of the Pennsylvania Railroad between Montandon and Mifflinburg, Pa. The distance between



THIS CAR OPERATES OVER THE P. R.R. LINE BETWEEN MONTANDON AND MIFFLINBURG, PA.

these two points is 10.9 miles. The car was delivered on its own wheels over the Pennsylvania Railroad lines from Philadelphia to Milton, Pa., a distance of 167 miles.

For February and March the car-mile cost averaged 40.23 cents, but it is expected this figure will be lowered as the operating personnel becomes more familiar with maintenance of the gasoline car. The railway company gives the following cost figures, in cents per car-mile:

	Cents per Mile Feb.	March		Cents per Mile Feb.	March
Wages.....	17.79	17.43	Maintenance (labor).	0.59	0.58
Gasoline.....	5.93	5.38	Interest.....	4.39	3.88
Lubricants.....	0.64	0.72	Depreciation.....	9.14	8.08
Miscellaneous.....	3.19	2.30	Insurance.....	0.11	0.10
Maintenance (material).....	0.14	0.07	Total.....	41.92	38.54

The depreciation is figured on an eight-year basis, a first cost of $16,564.03 and an approximate life of 200,000 miles. The company operates storage-battery cars over the Montandon-Mifflinburg route, and the same force has been used to operate the rail car. Two men form the rail-car crew. The motorman runs the car and assists the conductor in handling mail, baggage and express. Overhauling and repairs are handled in the shops of the company, which employs one barn man for both gasoline and storage-battery cars.

The present schedule allows thirty-eight minutes for the run of 10.9 miles, the stops averaging about 1½ to the mile. The run is divided up into four fare zones, the fare in each being 7 cents. Railroad tickets are honored when presented, and the Pennsylvania Railroad reimburses the company for them at regular zone rates.

The car seats forty passengers, thirty-five in the passenger compartment and five in the baggage compartment. The body was built by the J. G. Brill Company, Philadelphia, and is mounted on a Mack A.C. chassis with a 22-ft. wheelbase. The car is 9 ft. 8⅝ in. wide and 27 ft. 11⅜ in. long, both over-all dimensions.

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Zone Passes for Beaver Valley

The Fare per Zone on a Cash Basis Is 5 Cents, but Unlimited-Ride Service on Transferable Passes Has Been Made Available for Rides Covering One, Two or More Zones

THE Beaver Valley Traction Company, as described in the ELECTRIC RAILWAY JOURNAL for April 9, 1921, is a cross-country electric railway with a main line 9.5 miles long between College Hill and Leetsdale and several other routes. With the Pittsburgh & Beaver Railway, there are 26 miles of route. The population of the entire district is about 64,000 and of the largest community, Beaver Falls, 13,000.

In pre-war days this railway was on a 5-cent zone basis with zones up to 6 miles. The first fare changes were to 6 and 7 cents respectively with no change in the lengths of zones. As these higher fares did not produce the necessary increases in revenue and also cut down the number of customers, the company returned to a basic fare of 5 cents per zone, but the length of zone was cut to an average of 2 miles. This kept the fare within the limits of the towns served to 5 cents.

The 5-cent, short-zone plan proved the best plan tried up to that time, but unluckily soon thereafter came the depression, which hit the Beaver Valley so hard that traffic for eleven months ended Nov. 30 compared with eleven months of 1920 showed a loss of 18 per cent despite 10 per cent more service and no increase in fare. In these circumstances, W. H. Boyce, general manager of the railway companies, decided to sound the public before making any further changes in fares or service.

To this end, he sent out copies of the accompanying questionnaire to the larger employers of labor in the district for distribution among their people. The answers to these questionnaires showed where a large proportion of the employees lived, where they were employed, where they boarded the car, whether they owned or made use of fellow workers' automobiles, what they thought of the trolley service and whether they would be likely to buy a transferable, unlimited-ride weekly pass.

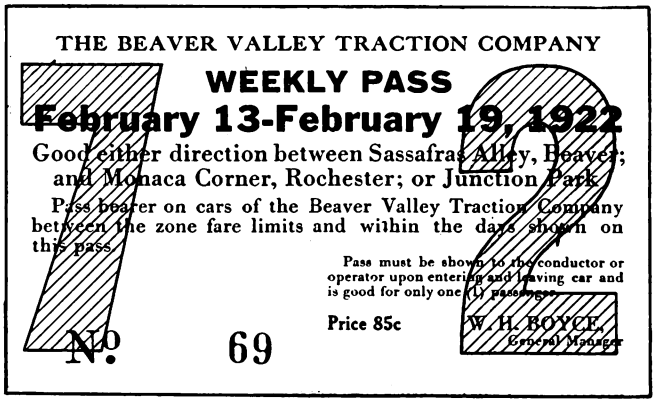
Disregarding, for the present article, the questions and answers relating to cars and service, the poll on the fare queries brought out the fact that (a) some people rode to work but not from work; (b) few rode home to lunch but would do so if the fares were lower; (c) some had stopped using the cars although comparatively few had automobiles or used the machines of their friends; (d) people who happened to live rather close to a zone boundary protested against the 10 or 15-cent fares which they had to pay for comparatively short rides each day.

Of course, the fact that the answers showed the writer's place of employment and of residence made it possible to judge whether he really was a good prospect for unlimited rides a day at more advantageous rates of fare.

After the information from this questionnaire had been compiled, the company printed a little folder of acknowledgment and explanation which it distributed to passengers through boxes in the cars. It took up the principal points of which complaint had been made and offered a few words of explanation about them. Thus, to the criticism that fares were high, the circular pointed out that it is impossible at this time to reduce the charge per ride except when rides are purchased by the wholesale, as by a weekly pass. Complaints that the safety car was not desirable were answered by the statement that it was a modern car, more than 5,000 of them being in operation in the United States and that it was a means of keeping the railway service going in a great many communities or of giving a more frequent service. Reasons beyond the control of the company for car delays were given, and passengers were urged to investigate the advantages of the pass.

ZONE-FARE TICKET MACHINE HELPS GREATLY IN TRAFFIC ANALYSIS

As explained, when the zone system of fare collection was begun the plan followed was to collect a new fare at each zone boundary. Upon the introduction of one-man safety cars on the Beaver Valley main line—which has seven active zones throughout the year and eight in summer—the company installed the Shanklin machine



A TWO-ZONE WEEKLY PASS

for issuing zone-fare receipts, as described in the ELECTRIC RAILWAY JOURNAL for Nov. 26, 1921. The records from this machine were of the greatest value in working out fare alterations because they show for any desired run, day or week, the origin and destination of every passenger.

For example, the analysis of Route 2001, the main line, for Friday, Dec. 16, 1921, showed:

3,933 passengers rode within one zone
1,348 passengers rode within two zones
217 passengers rode within three zones
78 passengers rode within four zones
96 passengers rode within five zones
102 passengers rode within six zones
4 passengers rode within seven zones

These figures alone indicated that it was hardly worth while to get out a special form of transportation ticket for any ride exceeding three zones, even if that class of traffic would be doubled thereby. In addition, the Shanklin records also permitted the separate classification of each set of zone passengers, the one-zone riders on Route 2001 varying from 1,519 to 86 in number, according to the location of the zone. This gave a clue to the further elimination of special transportation.

An analysis was also made of the steam railroad

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PLEASE FILL THIS OUT

If you want a lower street car fare please fill out this blank, answering each question, as it is material to us in making a survey of the conditions. Your filling out this blank may result in our adopting a ticket method by which you will feel justified in using the street cars more frequently

By what plant are you employed? _____
(Give name and location by street and No.)

What is your name? _____

What is your house number? _____ On what street do you live? _____

_____ In what town? _____

Do you ride the cars to your work? _____

Where do you board the car going to work? _____

At what time of day? _____

Do you ride home from work? _____

Where do you board the car? _____

At what time of day? _____

Do you now ride home to lunch? _____

Would you ride home to lunch if the fare is reduced ? _____

About how much do you spend for all of your street car fares, per week? _____

Do you own an automobile? _____

Do you use it to go to and from your work? _____

Do you carry other workmen with you? _____

What is there about our service that is not satisfactory to you? _____

_____

_____

If we sold a pass for a certain amount that would permit you or any member of your family to ride as frequently as you might wish, would you be likely to buy such a pass each week ? _____

With the question of a reduced fare for the worker to be considered, won't you help us reach a decision by filling out this card ?

We thank you.
THE BEAVER VALLEY TRACTION COMPANY
and
THE MANAGEMENT OF THIS PLANT

SETS OF THIS QUESTIONNAIRE WERE SENT OUT TO EMPLOYERS FOR DISTRIBUTION AMONG THEIR EMPLOYEES

commutation service and rates in this territory with a view to seeing if any of it could be transferred to the electric railway. It was found, however, that the bulk of this business is done during the rush hours and is handled at such low rates that they could not be met by the electric railway. For the runs exceeding three electric railway zones, also, the steam railroads offer a big advantage in speed to all who live reasonably near the stations.

A VARIETY OF ZONE PASSES ADOPTED

As the result of these several studies, the company decided to install an adaptation by Walter Jackson of the unlimited ride pass first suggested by him for Racine, Wis., and since installed at Kenosha, Youngstown and Fort Wayne (Feb. 28, 1922). Actually, the Beaver Valley passes as inaugurated on Feb. 13, 1922, strongly resembled the station-to-station season ticket of the London Underground Railways, since instead of being universally valid over all parts of the railway they could be used only between the points shown on the pass. This naturally made the pass less attractive because it may not meet the social or amusement direction of travel desired by the same person who finds it handy for his home-job riding. To meet this condition, the $2 three-zone pass is now good for unlimited riding in either direction.

The number of passes originally installed was twenty, made up of:

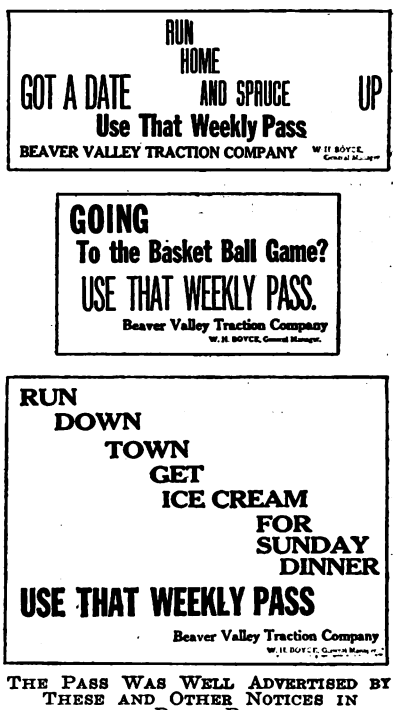
1 school pass	$0.75 per week
11 one-zone passes	$0.85 per week
6 two-zone passes	$1.60 per week
2 three-zone passes	$2.00 per week

The experience of the first four weeks showed that in some cases the number of passes sold of a given kind did not make it worth while to print so many varieties. The company is prepared, however, to sell from its office any combination on demand. For these rarer styles, a rubber stamp for zone identifications will answer. The revenue from the sale of passes has increased from week to week. The whole plan is simply an effort to promote good will, and give the public every possible opportunity to make more use of the company's facilities.

The pass procedure is very simple. On boarding or leaving either a one-man or two-man car, the passholder shows his pass, which bears the zone designations in either numerical or letter form, according to the route. On leaving, he shows it again. The figure "7," in the cut on page 673, is simply for the seventh week of the year. In addition to the zone designations (single or combination), the card carries the names of the boundaries. It will be understood that a passholder can ride beyond the boundaries shown on his pass merely by paying for the excess zones in cash via the locked farebox.

Of course, the ideal scheme would be to sell passes good for one, two or more zones on any part of the line, but this would involve so much checking that it would be impracticable on a one-man car. With the present plan, there is absolutely no addition to the work of the operator. In fact, his work is reduced because every pass ride means one fare transaction and receipt issuance less.

Because of the double visé of the pass, it is not necessary to change the colors frequently or to use different colors for different zones. The small number of each kind required also demands simplicity from the standpoint of the printer's bill. Mr. Boyce has solved the problem of pass cost neatly enough by selling the space on the back to the local lighting company at a figure that eliminates this factor. A word or two is in order on the principle used in fixing the prices of the passes. That of the one-zone pass is 85 cents, which is equivalent to seventeen rides a week or practically three rides a day. In such small communities as are served by this company, a pass-holder can readily average four rides a day by making it his business to go home to lunch or ride instead of walk in the evening or on holidays. Thus, he gets his two off-peak rides at half price.



THE PASS WAS WELL ADVERTISED BY THESE AND OTHER NOTICES IN THE DAILY PAPERS

The price of the two-zone pass was set at $1.60, which is equal to sixteen 10-cent rides a week. The concession is slightly greater because of the greater revenue paid per trip and because a two-zone rider will be likely to average fewer extra rides outside of the "home-job" trips. The cost of the universal pass is $2 or the cost of thirteen and one-third rides, since this class is likely

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Street Car Fares Way Down Now

Ride on a Weekly Pass

All the Riding You Want for a Solid Week at About What You Spend Now

1 Zone $0.85.....for a Weekly Pass
2 Zones $1.60.....for a Weekly Pass
3 Zones $2.00.....for a Weekly Pass

A Hundred Rides for Two Dollars
They Now Cost You Fifteen Dollars

We can make this enormous reduction when we are assured of so many rides each week. A certain volume of Pass sales will remove the uncertainty from our business. You are to profit by this.

If You Want This Reduced Fare Buy Your Weekly Pass Now and Buy One Each Week

The pass is probably the only way by which we will be able to reduce the present fare within a period of several years.

We Believe You Should Have Some Reduction in Fare

We want to bring down the cost of living. We believe the wholesale purchaser of rides should have some reduction in fare. After months of study, in which we were assisted by many local manufacturers and their employees, and the most prominent fare expert in this country, Mr. Walter Jackson, of New York, we have decided on the adoption of the Weekly Pass. Our receipts are running 22% behind last year's, but still we can't close down and wait for business to pick up. We are going out after business even with this enormous reduction in rate.

We Want You to Know that We Want Your Business

It is essential to your own prosperity that the transportation lines of your community prosper. Suppose we shut down two weeks or three to six months every year? What kind of a community would this be?

Do You Appreciate that We Never Shut Down?

That always, day and night, the loyal street cars are at your service? Good times and slack times, rain, snow, fog, in cold or hot weather, always ready to take you anywhere on our lines. If you appreciate it

Buy Your Pass On Sale Now by all Conductors

Buy a Weekly Pass
Ride as Often as You Can

BEAVER VALLEY TRACTION COMPANY
W. H. BOYCE, GENERAL MANAGER.

Buy Your Pass On Sale Now by all Conductors.

WHY REGULAR RIDERS SHOULD BUY THE PASS

to take still fewer excess rides; nor will many steam railroad commuters be likely to change over.

Although the number of passes in use was twenty, the number of applications was greater, inasmuch as some of the passes are good between specified points on either the main line or the Riverview line (Route 2005). This arrangement also gives the passholder a more liberal use of his transportation than otherwise. No attempt has been made to record the number of rides taken on each kind of pass, but each kind could be recorded in turn purely as a matter of curiosity, if desired.

NO MEANS OF PUBLICITY LEFT UNTRIED

Mr. Boyce is known as one of the country's strongest believers in, and practitioners of, publicity. An inspection of the window cards, dasher placards and newspaper advertising would reveal that he reveled in the opportunity for good will offered by the unlimited-ride pass. The newspaper advertisements, in particular, display his direct, candid way with present and prospective customers. Among the varieties of copy used was the curiosity type, as in the one headed "Coming .....WE---- PA--....What Is It?"; the personal style, as in the one reading "Got a Date? Run Home and Spruce Up. Use that Weekly Pass"; the timely variety, as "Going to the Basket Ball Game?" and a "Go" advertisement urging some of the many uses as: To work, to bowl, to see "honey-bunch," to church, to school, to visit the well, to visit the sick, to the lodge, to the club, etc.

Both the problem of selling the pass and of advertising its uses are complicated by the fact that the shoestring layout of the Beaver Valley system demands a variety of passes. For this reason, one cannot expect at any time the same high range of percentages of sales and use possible with a universal city pass. The fact that the base fare is the convenient nickel also tends to restrict pass sales in comparison with systems with higher and more cumbersome rates of fare.

Wages Lag in Living Cost and Price Declines

ANALYSIS of changes in wages and commodity prices and in living costs throughout the United States from 1914 to 1921, made by the J. L. Jacobs Company, engineers, Chicago, shows that wage increases ran ahead of living costs in 1918, and that at the peak early in 1920 average wages had increased approximately 134 per cent over 1913, while the cost of living increase for the same period was about 116 per cent. Since then both living costs and commodity prices have declined much more rapidly than the wages of employed industrial workers. Digests of wage changes during 1921, made by this organization, cover reports from 1,026 establishments and industrial groups in practically every key industry in the country and show average wage reductions during the year 1921 of 16.1 per cent for over 5,000,000 workers.

Data from the 1026 establishments and industries show that approximately 4.7 per cent report reduced wages 30 per cent or over, 8.6 per cent reduced wages between 25 per cent and 30 per cent, 24.2 per cent reduced wages between 20 per cent and 24 per cent, 18.2 per cent reduced wages between 15 per cent and 19 per cent, 34.1 per cent reduced wages between 10 per cent and 14 per cent, and the balance of 10.2 per cent made wage reductions of less than 10 per cent.

Classified according to industries, the data show the largest reduction in the meat packing industry. There the average reduction has been 25.5 per cent for the 200,000 workers in that industry. The reductions then taper off to 14.8 per cent for approximately 140,000 street railway and other utility employees in 161 cities, approximately 12½ per cent reductions for railroad and express employees and an average 16.4 per cent reduction for over 866,000 employees in miscellaneous establishments and industries.

Among the public utilities, wage reductions reported show that of the 161 organizations thirty-five reduced wages 5 per cent to 9 per cent, fifty-seven reported reductions of from 10 per cent to 14 per cent, thirty-one from 15 per cent to 19 per cent, twenty-six from 20 per cent to 24 per cent and twelve reduced wages over 25 per cent. Some of the larger street railways reporting reductions were in the cities of New York, Philadelphia, Brooklyn, Boston, San Francisco, Detroit, Cleveland, Pittsburgh, Denver, Los Angeles, Seattle, Albany, Indianapolis, Buffalo, Milwaukee, Omaha, Topeka, Council Bluffs, Salt Lake City, Mobile, Ala.; Fort Wayne, Syracuse, N. Y., and Newark, N. J.

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Control Equipments for the Frankford Elevated

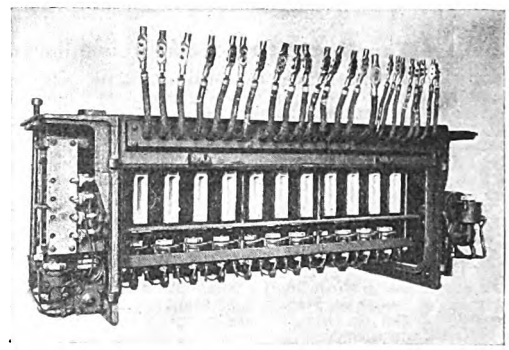
Electro-pneumatic, Battery Operated Unit Switch Control with Many Special Features Was Chosen —Interchangeability with Existing Equipments of Market Street Lines Can Be Had with Few Changes

THE control equipments for the cars for the Frankford Elevated line in Philadelphia will include all features necessary for extending subway as well as elevated service. The use of storage batteries insures an uninterrupted supply of energy for the motor control, the emergency lights, door engines, signals and other devices necessary for efficient and safe operation in underground service. With the motor control fed by a storage battery, the train may be stopped in an emergency by reversing the motors regardless of the availability of line voltage. Also the source of control energy not being dependent on the power available on the head car of a train makes it unnecessary for the motorman to operate the train from the second or third car when the main power fuses are blown on the head car, thus eliminating one source of delay encountered in elevated service where battery control is not used.

Another consideration in which battery control has apparent advantages is in regard to reliability of regular operation. This is insured, since the comparative low voltage of the storage battery practically eliminates control failures due to insulation breakdowns, and the low voltage is not dangerous to life.

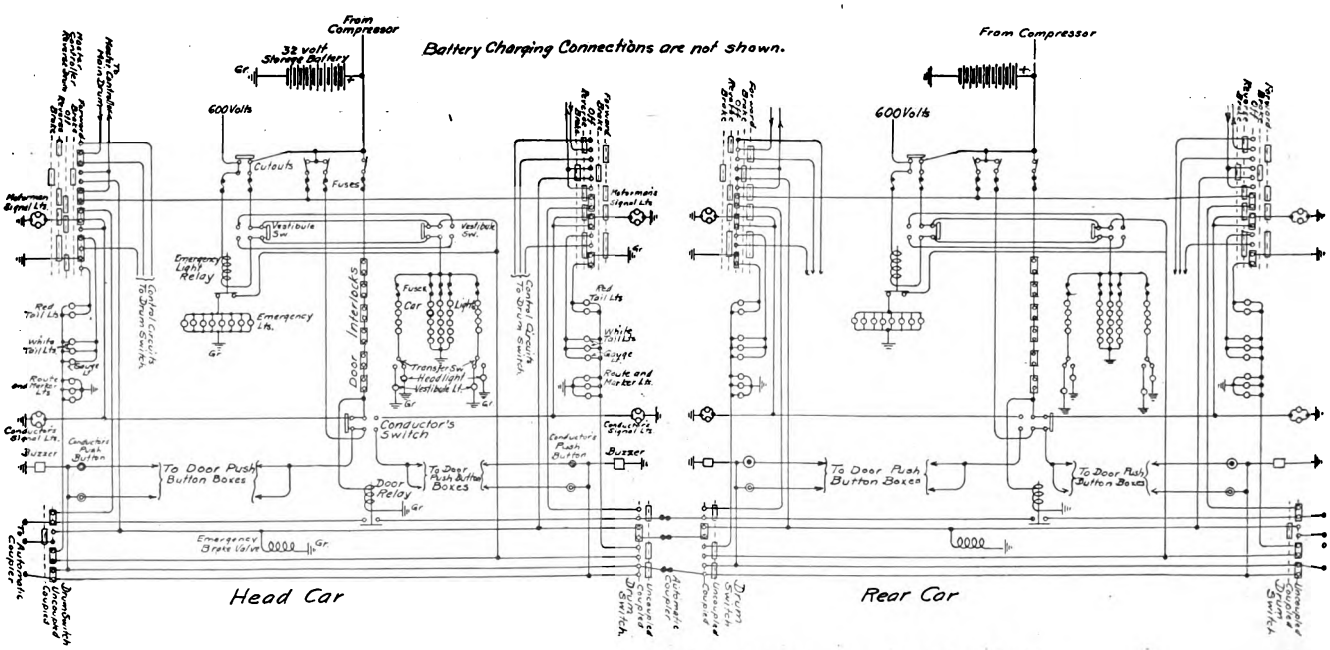
The unit-switch control equipment includes twelve Westinghouse electro-pneumatic unit switches of the HL type for effecting the principal changes in the main motor circuits, and also for overload protection. Eleven of the switches are grouped together into a main switch group, on the ends of which are mounted the drum-type motor reverser and the control sequence drum. In addition to the main switch group, another similar unit switch is mounted in a separate frame, with the arc chute venting to atmosphere. This unit serves as a line switch, opening on overload as well as interrupting the circuit under normal conditions. On the ends of the line switch are mounted the overload trip relay, line switch operating relay and the notching relay.

Automatic acceleration is accomplished by a current limit relay governing the movement of the sequence drum and thus energizing the unit switch magnet valve coils in a certain definite sequence. For the specific manipulation of the main circuits during acceleration, six steps are provided with the motors connected in series, four steps with the motors connected in parallel, and the closed circuit or bridging transition between the series and parallel connections. The normal or tapped field connection of the motors is effective on the last full parallel running step.



SWITCH GROUP—REVERSER AT END

The grouping of the unit switches, with their supplementary control apparatus, into two boxes gives an assembly which is compact, yet fully accessible for maintenance or inspection purposes. The use of separate electro-pneumatic unit switches for all main circuit switching provides accurate means for control of the acceleration in trains. The compressed air required



SCHEMATIC DIAGRAM OF LIGHT AND SIGNAL CIRCUITS FOR A TWO-CAR TRAIN

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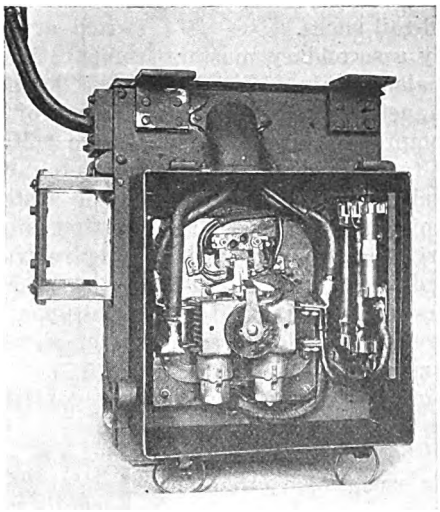
for operating the switches is taken from the common air brake supply through a reducing valve to give a normal pressure of 70 lb. per square inch.

Control power for operating the electro-pneumatic apparatus is taken from the 32-volt storage battery that is charged in series with the compressor motor. A train line circuit connects in parallel the positive poles of all batteries of a train and the control power is led from this common train line connection to a master controller at each end of the car. The master controller is provided with two handles, a main accelerating handle permanently attached to the controller and a removable reverse handle for controlling the direction of car movement. The two handles are mutually interlocked so that the main handle cannot be moved unless the reverse handle is in one or the other operating position. The movement of the reverse handle energizes the master controller drum from the control circuit supply and establishes circuits for the "Dead-man's" operation of the brakes and for the signal and marker light circuits. The emergency or "dead man's" application of the brakes from the master controller is secured both electrically and pneumatically. The main handle of the master controller has an upward movement whenever the motorman's hand is removed. This releases the fingers on the upper positions of the reverse drum and closes the circuit to the emergency wire of the air brake system. The same upward movement of the handle releases a small air valve in the top of the controller which operates a secondary relay valve that exhausts air from the brake pipe of the train.

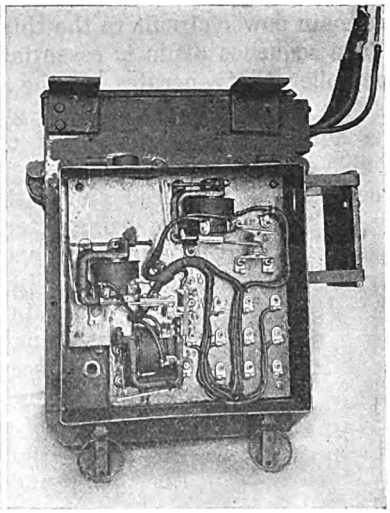
From the master controller, the control power is led to a train line from which the circuits are taken to the various unit switches and allied operating devices. Provision is made for cutting out of service any defective car in a train by means of a small drum type control cutout switch mounted on the panel board at one end of the car and connected in the circuits to the control apparatus. The train line runs to automatic electric couplers attached to the drawbars of the car. The train line contacts on the face of the coupler are energized through a separate drum switch which is operated when the cars are coupled in train to connect both air and electric train lines. Ten of the eighteen train line circuits in the coupler are utilized for motor control purposes, five for the electro-pneumatic air brake circuits, two for signals and one as an extra for any future extensions to the auxiliary circuits.

Protection for the control equipment is provided by the main and third rail fuses in conjunction with the overload trip relay and the high speed-line switch. The line switch opens at an extremely high speed in response to the overload relay, or due to a sudden drop in line voltage, which usually accompanies the sudden and very severe momentary loads that occur on third rail systems. A high-voltage surge usually follows immediately after the sudden voltage drop and the high speed of the line switch enables it to open quickly so as to protect the motors against the voltage peak. Operating the high-speed line switch by trolley voltage insures positive opening on the momentary interruptions of power when the train is passing at high speed over gaps in the third rail. In this way, the power circuits are opened locally on each car after passing each gap and the control operates automatically just as when starting the car, thus preventing flashing of the motors and surging of the cars in the train.

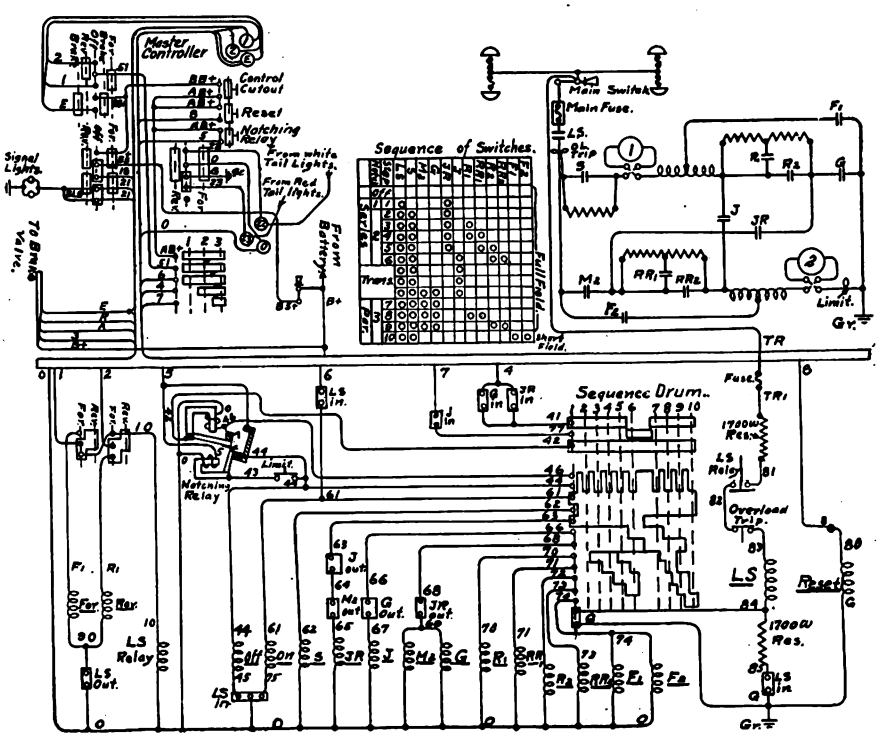
The overload trip relay has two operating coils, each connected in the circuit to one of the motors. The relay operates at the same overhead current value per motor with the motors in either the series or the parallel combination, thus allowing closer adjustment and better overload protection than would be obtained if a relay



OVERLOAD TRIP RELAY OF LINE SWITCH



NOTCHING AND OPERATING RELAYS OF LINE SWITCH



SCHEMATIC CONTROL DIAGRAM OF FRANKFORD ELEVATED CARS

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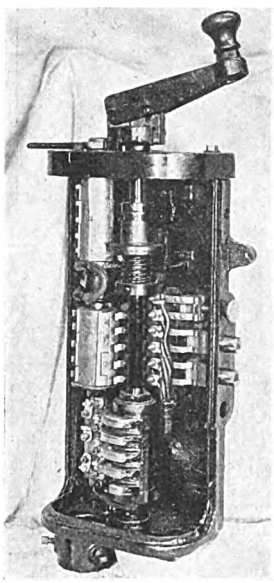
with a single operating coil were used and connected in the main power circuit to the third-rail shoes.

The sequence drum is essentially a secondary master controller that operates on the balanced-air principle, having the usual on and off magnets for regulating the admission and release of compressed air to the double-end piston which is geared to the contact drum. The drum is advanced automatically, notch by notch, by the "off" cylinder, being intermittently charged and discharged by the limit relay energizing or de-energizing the "off" magnet circuit. In addition, the sequence drum, in combination with the notching relay, provides means for securing non-automatic notching of the control independent of the limit relay. This operation becomes necessary only under exceptional circumstances, such as accelerating a train after it has stopped on the grade when coming from the subway to the elevated structure, or in a two-car train when one car has been cut out of service.



MASTER CONTROLLER

The notching relay is mounted on the line switch. It comprises essentially two relays mounted at right angles with the contacts interconnected so that notch-by-notch operation can be obtained when desired by intermittently energizing one of the relay coils from a push button located at the side of the master controller. The other relay coil is connected to the limit and sequence drum circuits so as to be energized each time the sequence drum advances a notch, which insures that the drum will pause momentarily on each notch during automatic acceleration.

There are eight tail lights per car, located in groups of two beneath the window rails at each end of the car. One of the 20-watt lamps of each pair is provided with a white lens, the other with a red lens. The interlocking in the master controller and drum switches is such that when the cars are coupled, the lights are automatically disconnected at the coupled ends, but the white lights show at the head end of the train where the master controller reverse drum has been operated, and the red lights show at the rear end of the train. The marker and route indicator lights on the ends of the car are also arranged to be lighted only at the head and rear of the train. This arrangement reduces the drain on the battery to a minimum, and also insures that the proper lamps are always lighted without special attention on the part of the train crew.

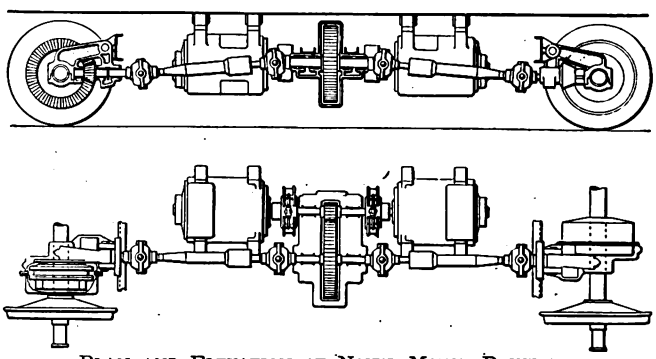
The motorman's and conductor's signal lamps are located at each end of the car in plain view of the motorman inside the car and the conductor outside between the cars. The lamps at the conductors' station between cars burn when the doors of the adjacent cars are closed, and at the motorman's station when all the doors are closed throughout the train. This selection of circuits is made by means of a conductor's switch and a relay on each car connected in series with the door interlocks on the car. The relay contacts throughout the train are connected in series by a train line circuit, which receives its energy through the master controller reverse drum and coupler drum switch at the rear of the train. This scheme places comparatively few interlock contacts in series throughout a long train, thus reducing to a minimum the chances of signal failure from open circuit or excessive voltage drop. In case a door cannot be closed completely, thus preventing light signal indications, the buzzer system insures that the motorman receives the starting signal. The buzzers are used at all times, being relayed from conductor to conductor, beginning at the rear of the train. The motorman starts the train upon receiving either the light signal or the buzzer signal.

Differential Drive Radial Truck in Germany

THE Dortmund Street Railway Company has recently put in operation an experimental single-truck car with differential drive. The truck is of the radial type, and the drive somewhat similar to that on an automobile except that both axles are driven through separate differential shafts from twin motors in the center of the truck. The mechanical portions of the truck and driving mechanism were supplied by F. Krupp & Company of Essen, and the rest of the equipment by Brown, Boveri & Company. The car was put in operation in June, 1921, and according to *Verkehrstechnik* has run nearly 4,000 miles without failure.

The accompanying drawing shows plan and elevation of the system of motor suspension and motor drive. The truck has a wheelbase slightly over 13 ft. Owing to the nature of the drive, the axles can take a radial position when the car is passing around a curve, and no difficulty has been experienced in driving this car at a speed of 22 m.p.h. around a curve of 70-ft. radius.

The motors are attached to the car underframe, the



PLAN AND ELEVATION OF NOVEL MOTOR DRIVE FOR SINGLE-TRUCK CAR

flexibility between the motors and the axles being secured by two universal joints in the driving shaft. The gage is only 1 m. (3.2808 ft.). The radial arrangement would permit the car to pass easily around a curve with a radius of 50 ft. and still keep the wheelbase at 13 ft. Usually with a single-truck car and a gage of 1 m. it is not practicable to have the wheelbase more than 10 ft., and even this is productive of much grinding at the curves.

United States Commerce Reports have been rearranged and are now classified by commodities and geographically with special sections devoted to transportation, tariff, commercial law and similar subjects. The information is received direct from over 600 representatives of the United States Government in the world's industrial and commercial centers.

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Letters to the Editors

An Appeal for a Square Deal for Electric Railways in New York

NEW YORK, N. Y., April 10, 1922

To the Editors:

Civilization is something the world has fought countless centuries to achieve. Men relish it today and struggle for its maintenance because they have come to realize that it not only is the cheapest but also the easiest way to live. Next to peace of mind what they most long for is physical comfort.

To obtain physical comfort a man pays three times the rent that he needs to pay in order to domicile himself in an apartment with elevator service. For the same reason he hires a taxicab to take him a distance that he could easily walk or, if he is a man of means, he rides to his office mornings in his limousine when the subway, the elevated lines or a bus would take him there more expeditiously.

It is because of the physical comfort that it gives, with its rule that every passenger shall have a seat and there shall be no crowding, that the service of the Fifth Avenue Coach Company has become so popular. It is, in fact, the Pullman service of city transportation, and the waiting crowds along its various routes demonstrate the willingness of the people of New York to pay a reasonable price for a service which is distinctive and which assures physical convenience and comfort.

Americans are the hardest workers in the world. That is why America leads all countries in the conveniences, comforts and luxuries that it offers its people. It is bred in the bone of Americans to pay unhesitatingly for service well rendered. Briefly, such service means the efficient, proficient supplying of the conveniences of life at a cost economically sound and just.

Among all modern conveniences what is more essential today than transportation? America was the first great nation of the world firmly to weld itself together by land transportation. And for the comforts and conveniences that its great transportation systems offer its people have always been willing to pay a fair price. No American seeks something for nothing. Few Americans are blind to the fact that great aggregations of capital which have been made to render public service are entitled to a fair earning power.

We have heard much, through the press and otherwise, of what has been termed the "disgraceful overcrowding and congestion of present transit facilities." Yet here in New York, a city which enjoys the most wonderful and safest transportation system the world has ever known, there is continued insistence that a service shall be rendered at a price which represents an actual loss to those furnishing it. No other service, public or private, is demanded on such terms by our people. Fair and square in everything else, they obstinately insist on what has come to be known as "the 5-cent fare." Their attitude is so untrue to the real American spirit of square dealing that it is difficult to understand.

For the first time in our history we find our people demanding something for which they are unwilling to pay a fair price. Not only are they forcing the transportation companies to economies which necessarily reflect themselves in the service given, but they are choking off the development of our subway systems, and frightening capital away from traction investments which must be made by private citizens if our rapidly growing transportation needs are to be met.

It is time for New Yorkers to think these things over, to close their ears to the wailings of the agitators and demagogues who have made our transportation system a football for their private political ambitions, and to approach the matter in the true American spirit, as other cities have done.

This, in a word, calls for the square deal; a fair price for an honest service rendered, no more, no less.

What has become of the hard common sense, as well as the sense of fair play, of the New Yorker of bygone days?

M. A. SCREEBER.

*Standardized Methods of Employment**

BUREAU OF PERSONNEL RESEARCH
CARNEGIE INSTITUTE OF TECHNOLOGY

PITTSBURGH, PA., April 3, 1922.

To the Editors:

I have been interested to note that electric railway men are showing increasing interest in the scientific selection of men for their services. The interest in vocational selection methods generally is rapidly increasing. Evidence of careful study of means of improving the quality of employees comes from every direction. The question of getting the best men and women available is not limited to employees, as that term is usually understood, but extends to the need for better minor and major executives. All of us have realized the importance of the problems connected with obtaining satisfactory employees, but until the last few years we have been helpless in the face of the complexities involved. That electric railways are also interested in better selection is only evidence that they too wish to be in the forefront of this new movement.

My own belief is that the increasing importance attached to selection is being brought about by the rapidly developing appreciation of the business value of good will and satisfaction. "The public be damned" policy, or caustic criticism of the individual employee or of the transportation system in general, is giving way before constructive suggestions from public-spirited men, before the selection of "boosters" as employees and before carefully planned instructions on how the public can make the transportation system more efficient. One passenger crosswise in a car either in temper or actual position; one tired, cross platform man, can do more to destroy efficient service and satisfied patrons than a whole fleet of trucks stalled on the tracks. The adjustment of the human element is of utmost importance.

For these reasons I wish to commend the ELECTRIC RAILWAY JOURNAL for opening its pages to a discussion of the problems of selection as applied to platform men. I have read with interest the discussion of the report of a committee of the American Electric Railway Transportation & Traffic Association on this subject, and I have also enjoyed reading Dr. Gradenwitz's interesting

*The author of this letter was one of the compilers of the "Army Mental Tests" referred to in the discussion on personnel and training of transportation department employees at the 1921 Atlantic City convention of the T. & T. Association. As major in the army, he had much to do with personnel work during the war.—EDITORS.

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article in the Jan. 28 issue and Dr. John Leeming's article in the March 11 issue of the JOURNAL. Both writers have done an important and suggestive service; one in calling attention to the great need for carefully planned testing procedures, the other in emphasizing the inadequacy of the usual medical, neurological and physical examinations.

WHAT RECORDS SHOULD BE KEPT

There are certain points that, to my mind, should be more fully emphasized in the discussion of a selection program. An extremely important consideration is the matter of records. It should be impressed upon every official of every company that no question and no test applied to a prospective applicant is so unimportant that it can go unrecorded. In the first place the application of such a principle will eliminate much that is useless or disregarded in the interview and in the routine of the employment office. The only exception to the principle that occurs to me now is the introductory conversation that aims to set the applicant at ease before the beginning of the formal interview or test series. Even this should be carefully standardized. But a more important reason for careful observance of this point lies in the need for detailed records of the medical, physical, mental, emotional and social characteristics of the applicant. Unless the routine of record keeping is regularly maintained we shall never satisfactorily establish the value of any preliminary examination. Dr. Leeming has successfully shown the importance of the medical records in several specific instances. A like importance will finally attach to the other records if properly kept.

All of us have seen personnel men, employment managers, welfare workers and even plant physicians dismissed in the last few years. One reason, among others, has been the failure of these employees to demonstrate the importance of their work. They have relied too much on the performance of routine duties and too little on the accumulation of facts. If the facts demonstrate the value of tests and of routine examinations, no official is going to risk the loss of that information. Much of this work is new and therefore experimental. Certain psychological tests and records will doubtless prove to be of no value to a particular concern. It is therefore important that careful records be available so that a distinction can quickly be made between those that are proving of distinct importance and those that are not.

MENTAL ALERTNESS AND EFFICIENT EMPLOYEES

One of the striking discoveries dependent on the development of mental alertness tests is that men become dissatisfied and do not perform their work efficiently if their mental capacity is either above or below that required by the nature of their tasks. All sorts of reasons may be found to explain why the employee is inefficient or resigns or must be discharged. But the evidence now available shows that the majority of these are false, and that dissatisfaction and inefficiency can more often be traced to a lack of adjustment between the capacities of the employee and the requirements of the task given him. To determine the requirements of the task is the function of the job analysis. To determine the capacities of the applicants is the function of the physical and mental measurements.

The special ability tests as described in the Jan. 28 article illustrate one important series of measurements needed. They do not, except indirectly, indicate the mental level of the applicants. An applicant could conceivably perform these acts successfully and fail to pass the course of instruction that follows; or, passing both, become an employee and there quickly find the routine of his job unbearable. Space will not permit specific illustration of just such actual results. The Bureau of Personnel Research has determined the mental level of several thousand employees of different types in the last five or six years. It has been found very difficult to estimate mental alertness without tests so that employees can be properly placed. Groups that are commonly described as of average intelligence have been shown to be, in some occupations, above, and in others below, the estimated intelligence. Physical and emotional stability factors as determined by the physician, being equal, careful determination of the mental alertness differences in groups enable us to predict progress, efficiency and satisfaction more readily and accurately.

RECORDING THE INTERESTS OF EMPLOYEES

Other questionnaire forms of yet more recent development enable the employment manager to determine the major lines of interest and likes of the applicant. Where there are no distinguishable physical emotional or intellectual differences between two groups, it has been shown by appropriate questions that there is a wide difference in the things in which these two groups are interested; in the things they enjoy doing over and over, and in their ways of working with others. Of course, we all recognize that platform men should not be selected merely because they are needed nor because men want jobs. But in these days of many applicants, and good ones by every measure we have so far been able to apply, it is important to forecast as far as possible the probable length of service of the men selected. Employment managers tell me that this is one of their most pressing problems now. It is therefore important now, as it always will be, to select those men who by nature and training are willing to enter the particular occupation as a life work.

PERFORMANCE RECORDS

It is perhaps unnecessary to point out the need for performance records and for tests in the improvement of performance with practice. So many public service corporations and private corporations as well find these necessary for promotional, disciplinary and legal purposes. Two points may be emphasized. The difficulty of getting satisfactory records of efficiency, and the need for such standards in evaluating the various records of personal history, medical examinations, psychological tests, training courses and later tests for promotion. Many tests have been discarded both by the physician and the psychologist, or by the impatient executive when no one had sufficient data to evaluate the tests. Promotions have been based on factors that bore no relation to continuous efficiency of performance on the part of the individual.

In my very brief comments, I have endeavored to emphasize certain points that, I believe, will keep these new and important aids to proper selection and placement from suffering serious setbacks at the hands of their many friends. I have mentioned two or three forms of examinations that in my opinion should be included in any comprehensive employment procedure.

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They would require at most thirty minutes additional time of the applicant. But most important of all, the future of psychological examinations ought to be determined on the basis of adequate records and sound statistical procedure.

C. S. YOAKUM,
Director.

The Trolley Shoe or "Slide" at Low Speed

NEW YORK CITY, April 17, 1922.

To the Editors:

I happened to notice C. L. Greer's letter on the above subject, in your issue of April 15, page 641.

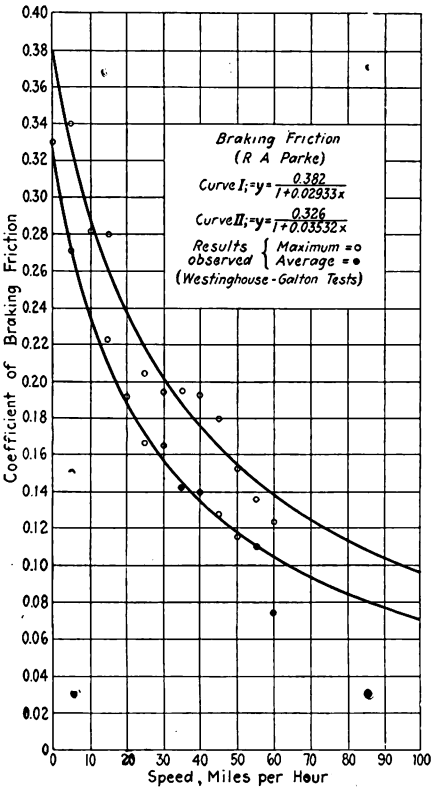
Mr. Greer appears to have proved by tests that the wear on the trolley wire is very much greater at low speed with the slide than with the trolley wheel, and that the extra wear is due almost entirely to increased friction at low speed.

He is entirely right on both points. It may have seemed strange to him, as it usually does to most people, that the friction and wear should be greater at low speed than at high speed; but it is all right, because it is all in perfect accordance with the physics of friction between unlubricated surfaces. As a matter of fact, everybody connected with the operation of a railroad already knows something, in a practical way, about unlubricated friction, because concrete examples of it are brought to his notice repeatedly by the wear of brakeshoes and of carwheels. It is well known that the grip of a brakeshoe on the tread of a carwheel, and the wear which is caused in both the shoe and the wheel, are much greater at low speed than at high speed, with the same contact pressure. Indeed, it is precisely this fact that complicates the action of a brake involving a variation of the brakeshoe pressure as a function of the speed of the train, because a constant shoe pressure means the danger of slipping, above a certain speed, and of skidding, below a certain other speed. Now the friction between a trolley wire and a non-lubricated trolley shoe or slide is exactly of the same physical character as the friction between a brakeshoe and a wheel tread. The explanation is the same and is very simple in both cases, being the physical fact that the coefficient of friction is very high at low speeds and falls off rapidly as the speed increases.

The relation between the coefficient of friction and the "velocity of rubbing," in the case of brakeshoes, was studied exhaustively by Galton and Westinghouse more than forty years ago. The accompanying diagram, taken from the printed notes given to the students attending my lectures on electric railways, about twenty years ago, gives the principal results of the tests made by Galton and Westinghouse, as reported and collated by the late R. A. Parke, a world authority on this subject. In this diagram the abscissas represent the speed of the train or car, in miles per hour, this speed being the same as the "velocity of rubbing" between the brakeshoe and the tread of the car wheel; and the ordinates represent the coefficient of friction corresponding to different rubbing velocities. Now the sliding speed of the trolley shoe or slide is the same as the train speed and the same as the velocity of rubbing of the brakeshoe. Hence, this diagram would also represent correctly the conditions in the case of the friction between the sliding shoe and the trolley wire, if the metals which are in frictional contact in this case were the same. As a matter of fact, however, the difference in dry sliding friction obtained with different metals is not very great, so that these curves approximate closely to the results that would be obtained from actual tests of the friction between metal surfaces of the same kind as the trolley wire and the trolley shoe. The curves will, in any case, be accurate enough to give an idea of the rapid increase in the coefficient of friction as the speed decreases.

By reference to the lower curve it is seen that the coefficient of friction is about 0.12 at 50 m.p.h. and double that value at 10 m.p.h. As the speed is further reduced the coefficient increases rapidly, being 0.28 at 5 m.p.h. and 0.32 at 0.5 m.p.h. The wear should, therefore, be the greatest at the points where the cars run most slowly, or where the greatest number of stops is made. Comparing the points of highest speed and fewest stops on an interurban line with the points of lowest speed and of most frequent stops in cities and towns, we would be warranted, from the curves shown in the diagram, in expecting the wear of the trolley wire to be two and one-half times greater at the stopping points. It would be interesting to know whether Mr. Greer has found as great differences as this. With a lubricated trolley shoe the case is quite different, because the coefficient is then equal, as I have shown in my lectures, to the algebraical sum of two values, one of which is on a descending curve similar to the curves shown in the diagram, while the other is on an ascending curve starting from 0 at zero speed. This means that the friction, when a lubricant is used, is made up of two kinds of friction, namely, solid or unlubricated friction, as before, but to a much lower degree, and liquid or viscous friction. The former decreases, and the latter increases, with the velocity of rubbing. The graph representing the solid friction component is of hyperbolic character, same as in the diagram, but with scales of ordinates which depend upon the condition of the rubbing surfaces, in respect to smoothness and finish, or polish, etc. The graph representing the liquid friction component is of parabolic character, the scale of ordinates depending upon the quality and condition of the lubricant. The resultant curve, representing the composite result, is a two-branch curve, having its highest point at or near "zero" speed, and which falls down to its lowest value at a very low speed and then rises as the speed increases. The scale of ordinates, in this case, depends upon both the condition of the rubbing surfaces and upon the quality and condition of the lubricant, as might be expected.

C. O. MAILLOUX.



FRICTION BETWEEN UNLUBRICATED METAL SURFACES AT DIFFERENT SPEEDS

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Devoted to How to Tell the Story

Illinois Travels De Luxe

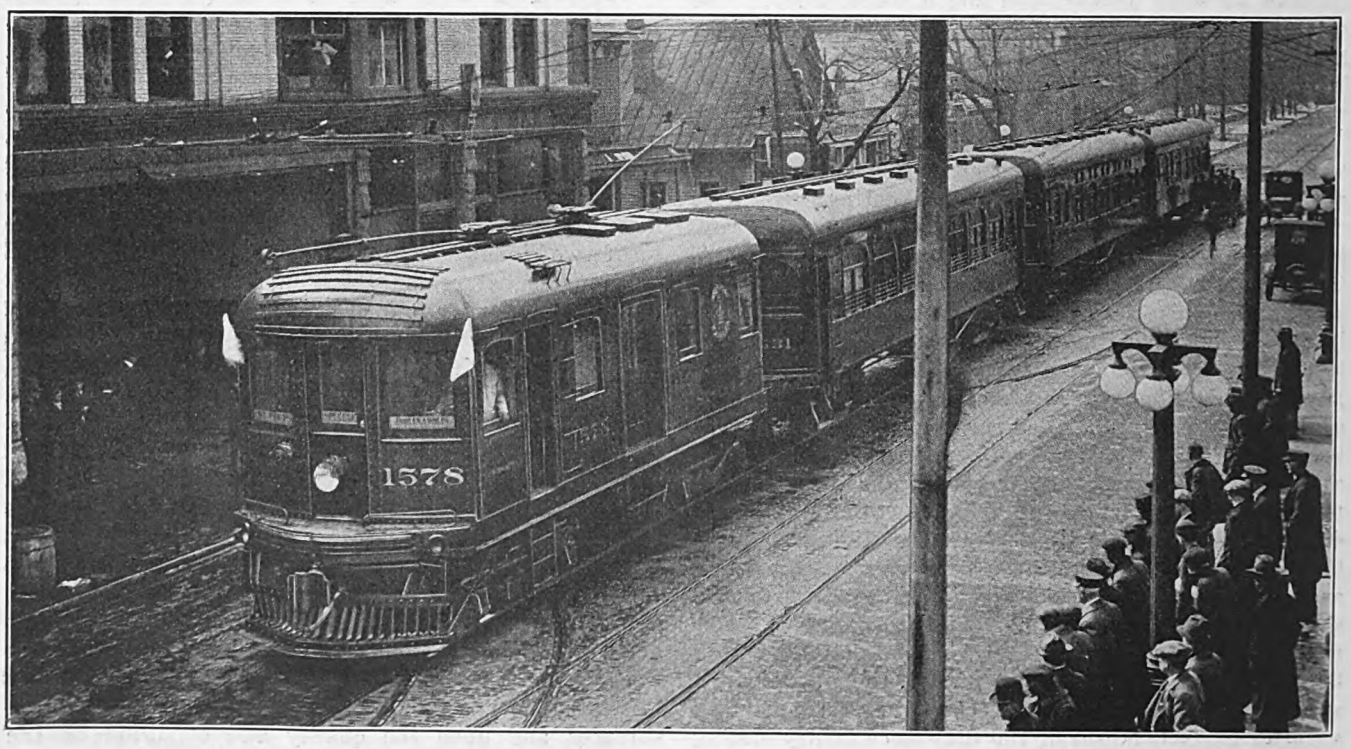
THE Illinois Traction System, Peoria, Ill., is now advertising its four-car electric train which operates nightly between Peoria, Springfield and St. Louis. So inviting is the service offered, in addition to the smokeless and cinderless feature of the trip by trolley, that no doubt the ticket agent will soon acquire the haughty air heretofore known only to the box office manager of a New York theatrical success. The folder, well illustrated, talks variously of the observation compartment of this marvelous train, the club compartment, with tables for writing of cards, and the smoking compartment.

The Pullman accommodations on the train beget wonder, and in themselves could win all traffic, for each of the twenty berths is nearly 6 in. longer than in Pullman cars on steam trains. Windows are provided in upper berths, and both upper and lower berths have safety deposit vaults for valuables. The train, which was on exhibition at the midwinter meeting of the American Electric Railway Association, is 216 ft. in length, weighs 360,000 lb., and cost $107,000. While the train was on exhibition near the Claypool Hotel where the Indianapolis meeting was held more than 10,000 persons inspected it. It received much publicity both at Indianapolis and in towns en route, where large crowds, informed in advance of the arrival of the special, collected to inspect it.

A heavy-duty sixty-ton electric locomotive is used to transport the passenger coach, sleeping car and parlor car. Engineers of the Illinois Traction System designed the equipment and part of it was built in the company's shops. Officials of the company feel that the train demonstrates the comfort and safety of electric railway transportation and the possibilities which lie in the interchange of equipment between electric and steam lines.

Officials of electric railways in Illinois were carried to the Indianapolis meeting in the car. Throughout Illinois the train was operated over lines of the Illinois

GROUP OF DELEGATES INSPECTING TRAIN



VIEW OF THREE-CAR TRAIN AND LOCOMOTIVE EN ROUTE TO INDIANAPOLIS CONVENTION

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Traction System. From Danville, Ill., to Crawfordsville, Ind., the tracks of the Big Four Railway were used. At Crawfordsville the train switched to the tracks of the Terre Haute, Indianapolis & Eastern Railway.

Sousa Concert Widely Advertised

THE Shreveport Railways utilized the local concert engagement of John Philip Sousa to advertise the convenience of the railway service. Practically the entire quarter-page advertisement was devoted to the announcement that Sousa and his famous band would play at the Fair Grounds. His program was announced in full, and a short biographical note of the conductor was contained in the advertisement.

The concert and the railway were coupled finally with the following:

The weather being inclement, you will be glad if you leave your automobile at home while attending the concerts and use the street cars. No Skid—No Danger—and much cheaper. The street cars take you to the Fair Grounds gate. You have a smooth concrete walk up to the Coliseum. Cars go to the Coliseum every seven and one-half minutes. There will be plenty of extra cars for the rush after concerts are over. Ride the street cars.

Utility Problems Discussed Direct with Public

A SERIES of fifteen meetings with stockholders of the Public Service Corporation of New Jersey was started on April 3 when Thomas N. McCarter, president, discussed the problems of public service enterprises on the Proctor Theater roof, Newark. With Mr. McCarter were Percy S. Young, vice-president in charge of finance; Edmund W. Wakelee, vice-president and general solicitor, and Harlow C. Clark of the publicity department, who also spoke. Mr. McCarter described the meeting as the first of a series of "one night stands" throughout the State.

In the audience were 1,500 men and women. It was estimated by company officials that a quarter of these were employees and the others stockholders. Mr. McCarter made an appeal for co-operation of stockholders, and asked that the company's past mistakes be forgotten. On his part he promised to forget the sharp criticisms directed at himself, and expressed hope that eventually every customer of Public Service would be a stockholder in the concern, paying monthly bills with dividends received.

Mr. McCarter said the idea of meeting the stockholders was advanced first by the head of the Pacific Gas & Electric Company in California and that he intended to "go about the State presenting the gospel of public service in one night stands" with his associates, making friends as best they could. Telling of 58,000 holders of company securities, he spoke of their remarkable power to create public sentiment that "would stand by us if we are right and see that we get a fair deal."

"The man at the head of a public utility company who does not crave the help and co-operation of the stockholders does not deserve the authority to run a corporation," Mr. McCarter said. He declared the two campaigns his company had made to have the general public become stockholders in the company had "just touched the fringe" and he hoped to see the company's 800,000 gas and electric patrons, as well as others, take stock in the concern eventually.

He announced himself as an optimist and said now that the war's problems are practically over the corporation is emerging from its handicaps better than ever. He referred to newspaper reports to show the stock is appreciating in value, and said the great activity of Public Service securities on the New York Stock Exchange augured well for the future of the company.

The problem ahead of Public Service is to get $5,000,000 or $6,000,000 of new capital each year, to keep pace with the growth of business and the public demand for improved service, he said. The bond market was exhausted for company securities and investments in common and preferred stock must provide this additional capital, Mr. McCarter added.

He said handicap results when the demagogue, the politician or any one else steps in to put a stop to this flow of financial support from the public. "He only cuts off his own nose as, deprived of this aid, the company is unable to supply the needs of the public," said Mr. McCarter.

Railway Wants to Know Sentiment of Patrons

A CAMPAIGN to determine the sentiment of residents of northern Kentucky regarding Green Line service is under way by the South Covington & Cincinnati Street Railway, Covington, Ky. Questionnaires are being placed in every home in northern Kentucky, ostensibly for the purpose of aiding the traction company with suggestions as to how to improve its service for the benefit of the public. The questionnaires also are distributed in the Dixie Terminal and boxes have been provided in the cars for the receipt of the questionnaires when filled out.

The Federated Improvement Association of Covington has issued a statement warning the citizens not to sign any papers asking for an increase in fares until they heard the people's side of the question.

The South Covington & Cincinnati Street Railway is operating under a perpetual franchise in northern Kentucky cities which fixes the fare at 5 cents. Several years ago the traction company offered to surrender its perpetual franchise and accept in lieu a twenty-year franchise with the right to increase fares. The offer was rejected by the City Commissioners of Covington and Newport.

Polk Laffoon, president of the traction company, said that the company is merely trying to ascertain the sentiment of its patrons relative to its service by the distribution of the questionnaires and is not endeavoring to get as many signatures as possible and then present a petition to the city commissions of northern Kentucky municipalities with the request that the company be given the right to increase its rates of fare.

A copy of the questionnaire is as follows:

To Green Line Patrons:

The development and progress of northern Kentucky depends on adequate transportation. We are trying to do our part to provide as much service and as well distributed accommodations as have been possible considering the revenue we have been receiving.

Our public relations department was organized to acquaint you with the operation of the Green Line and its relations to the development of Campbell and Kenton Counties. Through the "Topics" our problems have been explained; the difficulties which have beset us in trying to make our income meet the demands made upon it, and the uncertainties regarding future developments, have been brought out.

Requests have been made for changes, bettered and additional service, and service impossible under our present

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franchises. In keeping with our endeavors to give Green Line patrons what they want and need, we desire to obtain expressions from the car riding public showing what service is wanted in each locality.

Your reply is earnestly solicited in order that we may best serve your requirements. Kindly fill in this sheet carefully, and then hand it to the conductor on your next trip or drop it in the "question boxes" provided at the Dixie Terminal and waiting stations.

1. What car lines do you ride?.....
2. How many members of your family use the cars?....
3. Is time between cars satisfactory?..... (Yes or No). If not, what would you suggest?.....
4. Are more cars needed on the lines you use?..... (Yes or No). If so, should additions be to the regular or "rush" service?.....
5. What betterments or additions would you suggest? .....
6. How far will you go to aid us in bettering service, considering facts we have shown regarding the Green Line Nickel? .....

If It's Good for a National Advertiser It's Good for You

FOR years the Tri-City Railway, Davenport, Iowa, sold the advertising rights in its cars, but used none of this space itself. The space was always at a premium and the best known nationally advertised brands of foodstuffs and other goods were displayed there. The company also sold the right to place banners on its cars, but never used this space itself.

The year 1922 has marked a decided change. The company, in addition to selling space, has reserved some itself and every car now operating carries either an advertisement urging the public to buy United Light & Railway's prior preferred stock or educational copy.

For instance, a signboard swung in the top of the car carries these statements:

"This company has been required to invest over two-thirds of a *million dollars in paving.*"

"*In 1921 the fare of every twelfth passenger* went to pay interest and depreciation on this investment and did nothing to improve the cars or rails on which you ride."

"*Passengers on street cars don't ride on pavement.* Seems as if the paving should be paid for by those who use it."

"*Gentlemen*: Fairness and consideration for the women and children require that there be NO SMOKING on this car."

On the reverse of the card is a placard like this:

"YOU WILL BE INTERESTED TO KNOW

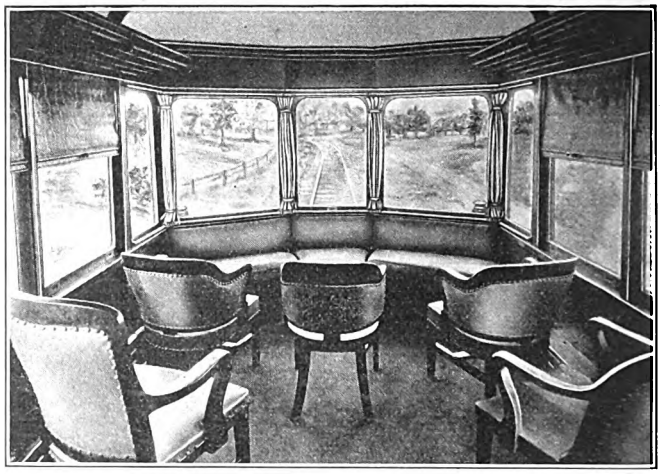
"That last year, a year of hard times—the Tri-City Railway Company alone paid out to your community—$461,260 in wages, or $1,260 each day; $134,670 in supplies, or $370 each day; $66,400 in direct taxes, or $182 each day.

"That's trading in your home town, isn't it? Two-thirds of a million dollars in the year, $75 worth every hour."

President B. J. Denman is planning to continue the advertising campaign and a series of strong arguments has been prepared which are designed to win more consideration for the utilities by the public. Thus there is presented for study the strange case of a utility company finally realizing that right at hand on its own property there is presented, perhaps, the very best medium of communication with the public. In other words, Tri-City Railway has been "sold" on its own advertising space, space which the biggest national advertisers in the country were "sold" on long ago.

Comfort Plus!

BY PROVIDING luxury, plus service, the Kansas City, Clay County & St. Joseph Railway is keeping itself favorably before the public. Its latest appeal to the luxury complex, as Freud would term it, takes the form of a parlor and observation compartment made part of a regular car. Parties attending meetings take to this club car as through the ages the proverbial duck has



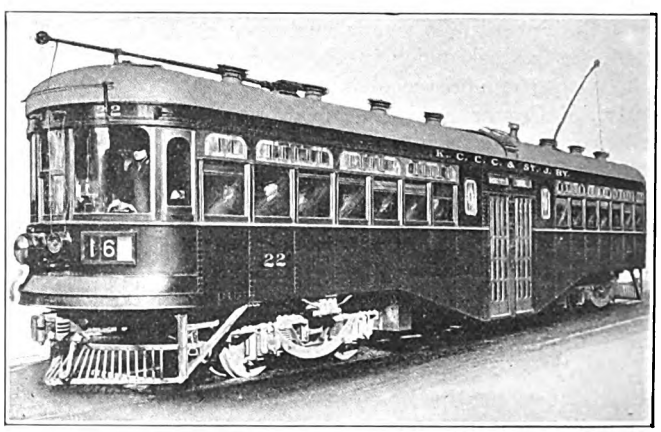
LUXURIOUS OBSERVATION END OF CONVERTED CAR

taken to the omnipresent water. The special compartment, with its soft carpet, upholstered chairs and soft draperies, provides a convenient and secluded place where conferences can be held en route from or to Kansas City, St. Joseph, Excelsior Springs, Liberty and other way points.

To charter the car a minimum of fifty round-trip tickets must be purchased at regular fare.

It takes less than an hour to convert one of the regular standard steel cars, 60 ft. in length, into the special. The six regular car seats of the rear twelve-foot compartment are unscrewed and five mahogany office chairs and three leathered folding chairs substituted. A heavy wilton carpet is used to cover the floor and is fastened with grommets and knobs. The entire equipment cost $284.

It is a wonderful territory through which the Kansas



EXTERIOR OF TYPICAL CLAY COUNTY CAR

City, Clay County & St. Joseph road operates, a country in which there is something new to be seen on every trip. The way to see it best, of course, is from the luxurious observation end of one of the Clay County cars.

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Rail Cars Must Combine Automotive and Railroad Practice*

By Charles Guernsey
General Manager Railroad Division, Service Motor Truck Company

PREVIOUS to 1905, efforts had been made to build a single-unit car, steam-propelled, for use on railroads, These cars were unsuccessful, owing primarily to boiler limitations. The light-fire engine type of boiler was too expensive to maintain and the locomotive type was too heavy. They had no particular advantage over the ordinary type of steam locomotives. They did not eliminate roundhouse supervision, etc. About 1910 the General Electric Company developed a car propelled by electric motors, current for which was supplied by a 200-hp. gasoline engine connected to an electric generator. A number of these cars were built, and some of them are still in service. They were not successful, however, because the great weight, complication and maintenance expense made their operating cost almost as high as that of a steam train.

Mr. McKeen of the Union Pacific developed the McKeen car, of which probably more have gone in service than any car yet developed. Here again, however, the great weight necessitated an engine considerably larger than was commercially accepted, so that the total operating cost of the car was only slightly less than the operating cost of the steam train. Cars of the McKeen type were not popular, because the builders attempted to provide in a gasoline car the same capacity and speed supplied by the ordinary steam train, consisting of a locomotive and two cars. Wherever such capacity is required, the steam train can ordinarily be operated at a profit. The real field for the gasoline car is in service where the steam train has more capacity than is required.

About ten years ago a car was built by the J. G. Brill Company, Philadelphia, on contract for the inventor. The engine was mounted amidships, driving by silent chain to a countershaft from which the drive was by propeller shaft to two bevel gear axles, one on either truck. Cars have been built by Hall-Scott, Sargent and others.

It is generally conceded that for continuous heavy duty work engines having cylinders larger than a 5-in. bore are not commercially successful. Warpage, lubrication difficulties and heating of valves, piston heads, etc., become too difficult to handle. If this is correct, then the failure of the heavy cars can be traced directly to a failure to appreciate the limitations of the gasoline engine.

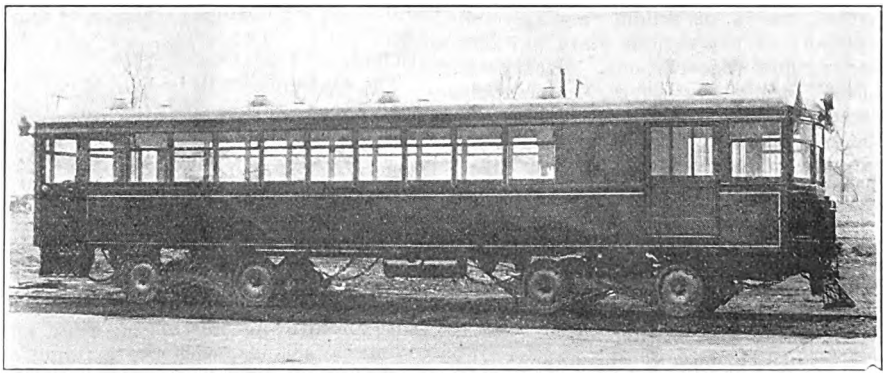
So much for the development by the railroads and railroad men. On the other hand, manufacturers of motor trucks have for several years equipped chassis ranging from ¾-ton to 5-ton capacity with flanged driving wheels, to adapt them for operations on rails. These cars have in general been successful. Owing to the light weight, low rolling resistance and the small engines required and in some installations to the fact that they can be handled by one man, the operating cost has been low. These converted motor trucks, however, were unduly limited in capacity and speed. There still remains a decided middle ground between the rail bus or rail car, as we have known it in the past, and the field of the steam train. It is in this middle ground that the gasoline rail car can make a place for itself, provided it is designed specifically for operating on rails. It is in no sense a converted motor truck. It represents a combination of automotive and railroad practice.

In the past the designs have been based almost entirely on one practice, to the exclusion of the other. To illustrate the point, some of the earlier cars developed by the railroad men weighed more than 50 tons and required a 300-hp. engine, although they had seats for only from fifty to sixty passengers. They did not give due consideration to the automotive side of the design. They attempted to use a gasoline engine in a car of steam railroad design.

By careful design and the use of alloy steels, anti-friction bearings and other features proved in automotive use the weight can be materially reduced. Weight must be a minimum in order to keep the rail car requirements within the capacity of proved gasoline engines.

It is just as undesirable to forget the railroad point of view entirely. Many of the features of railroad designs are the result of almost a century of development. The designer must weigh his problem carefully, choosing from railroad practice those features which fit in with this new type of equipment.

The rail car should combine the light weight of the motor truck with the safety, steadiness, comfort and convenience of the steam coach. This means that it should include such features of design as four-wheel pivoted trucks front and rear, full speed either direction, air brakes and safety appliances. The rail car shown here has an over-all length of about 44 ft., a seating capacity of thirty-eight, drop seats for eight in the baggage room, making a total capacity of forty-six passengers. The baggage space is 70 sq.ft. The car is provided with standard vestibule doors, saloon, comfortable seats and electric lights. Yet the total weight of this car is only 13 tons. This is less than one-third of the weight of the old-time motor cars of the same capacity, and a 60-hp. engine can be used, as against the 200-hp. engine required by the other types. At the same time a speed of 48 m.p.h. has been obtained, and a speed of 35 m.p.h. can be maintained indefinitely without damage to the mechanism. The fuel consumption is small, the car running between 5 and 7 miles to a gallon of gasoline. Because of the light weight, the car has a good acceleration, a speed of 25 m.p.h. being reached from a standstill in thirty seconds.



GASOLINE CAR FOR RAIL SERVICE. IT WEIGHS 13 TONS AND CARRIES THIRTY-EIGHT PASSENGERS, WITH DROP SEATS FOR EIGHT IN BAGGAGE COMPARTMENT

This car is arranged with two four-wheel pivotal trucks. The drive is from the power plant located forward, through an auxiliary transmission contained in the bolster of the front truck, to the two axles of the front truck. The auxiliary transmission is so arranged that either one of two pairs of gears can be used to transmit the drive, thus giving in effect two high gears. One of these gears is proportioned for the ruling grade on the particular railroad where it is to be used, while the other gear is proportioned to give a maximum speed in straight-away operation.

The success of the rail car, after all, hinges primarily on the engine. The car must be designed with this thought always uppermost. The engine must stand up under the severest service. It must be capable of operating continuously at high speed and under wide-open throttle. It must operate with the minimum of vibration. Everything must be accessible and so arranged that repairs can be made quickly.

The gasoline rail car will enable many branch lines and short lines, which are

*Abstract of paper given March 29 at Indianapolis before Indiana Section, Society of Automotive Engineers.

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now operated at an enormous loss, to be converted to a money-making basis. A 13-ton car has low first cost and can be operated for 20 to 30 cents per car-mile, as against a cost of $1 to $2 per mile for steam operation.

The gasoline rail car as a unit possesses many advantages over steam and electrified service—speed, frequent service, low cost of operation, crew of one or two men, elimination of the usual terminal facilities and great reduction in initial cost and fixed investment. Frequent service can be given, which may not be justified by a steam train. A freight-carrying unit can be installed in conjunction with a passenger unit, at an initial cost much below that of a passenger unit.

Utilities Division Purchasing Agents' Association Proposed

A MOVEMENT is under way in the National Association of Purchasing Agents, which has a membership of approximately 4,500, to form a division for public utility purchasing agents including the electric railways, light and power, telephone, water and gas companies, many of whom are already members of the various state purchasing agents' associations. Harry H. Lloyd, purchasing agent, Indianapolis Street Railway and the Terre Haute, Indianapolis & Eastern Traction Company, is chairman of the public utilities committee and public relations committee of the Indiana Association, and was appointed chairman of the tentative national committee at the Indianapolis convention of the National Association of Purchasing Agents.

Mr. Lloyd reports that a great many public utility buyers throughout the country are interested in a division of the national association which will be devoted to the common interests of the utilities and still maintain the advantage of affiliation with the purchasing agents of the big manufacturing industries of the country. Mr. Lloyd had suggested the formation of utility committees in various states which will be co-ordinated in a non-geographical national committee and will also develop an interest of the railway membership in the purchase and stores committee of the A.E.R.A.

It has been suggested that as the National Association of Purchasing Agents holds its convention at Rochester, N. Y., May 15 to 20, 1922, as many utility purchasing agents as possible attend this convention whether already members of the various state purchasing associations or not. If sufficient interest is manifested in the movement by the public utility buyers, it will be possible to have a national committee definitely organized at that time. Mr. Lloyd says this should be of great advantage to the various utilities throughout the country.

A dinner for utility purchasing agents will be held on Tuesday, May 16, at the Rochester convention, and also a joint conference with the national fuel committee.

Improvement in Unemployment Situation Among Engineers

ACCORDING to reports from the Employment Service Bureau of the Federated American Engineering Societies the records of the first quarter of 1922 indicate a distinct improvement in the unemployment situation in the engineering profession. There was a 41 per cent increase in the number of men placed by the bureau and more than 100 per cent increase in the number of available positions listed with the bureau in this quarter compared with the same quarter.

The bureau reports that there is a noted increase in the higher grade openings which are sent in, indicating that many companies are actively preparing for a return to more normal business conditions, in the mind of the bureau.

Public Conference on Business Training of Engineers Called

THE United States Commissioner of Education is calling a second public conference on commercial engineering to investigate business training of engineers and engineering training for students of business.

The conference will be held May 1 and 2 at the Carnegie Institute of Technology in Pittsburgh. Outstanding topics at the conference will deal with the new problems that have recently arisen in modern industries, the solution of which demands a more scientific approach to include job analyses and personnel specifications and a translation of these into a new and teachable content for use in our engineering and commerce schools, with the training of the engineer for a better understanding of problems relating to community development and with the training of the engineer for management of overseas engineering projects.

Southwestern Electrical & Gas Association

A JOINT meeting of the Southwestern Geographic Division, N. E.L.A., and the Southwestern Electrical & Gas Association will be held in San Antonio May 3 to 6. A summary of the program follows:

Wednesday, May 3. Morning, opening joint session. Afternoon, separate meetings of the following sections or committees: accounting, commercial, public relations, technical, railway.

Thursday, May 4. Morning, joint session. Afternoon, separate meetings of the same sections mentioned above. Evening, banquet.

Friday, May 5. Morning, joint session. Afternoon, joint session followed by executive session, N.E.L.A. division; separate meetings of power and railway sections.

Saturday, May 6. Morning, executive session of S. E. & G. A.; separate meetings of accounting technical and public relations sections, southwestern division, N.E.L.A.

A list of the papers scheduled for presentation at the railway sessions follows:

"Merchandising Transportation," by G. I. Plummer, superintendent of traffic, Dallas Railway.

"Economics of Car Maintenance Through Modern Shop Practice," by Walter Silvus, master mechanic, Texas Electric Railway.

"Methods for Relief from Traffic Congestion," by W. H. Holden, superintendent of transportation, San Antonio Public Service Company.

"Standard Transfer for Different Companies." Round-table discussion lead by A. B. Paterson, acting general superintendent of railways, New Orleans Railway & Light Company.

"Accident Prevention Methods," by Alves Dixon, superintendent of railways, El Paso Electric Railway.

"Vocational Training," by C. J. Crampton, superintendent of safety and efficiency, Dallas Railway.

"Adjustment of Track Construction and Maintenance to Modern Light Weight Cars," by R. G. Taber, engineer, Stone & Webster, Fort Worth.

"Operation of Double Truck Cars with One Man," by G. S. Brush, superintendent of transportation, Houston Electric Company.

"Possibilities of Motor Bus or Trolley Bus for Suburban and Feeder Service." Round-table discussion led by J. P. Griffin, general passenger agent, Texas Electric Railway.

"Overhead and Car Current Collecting Devices," by L. E. Delf, electrical engineer, Northern Texas Traction Company.

"Training Platform Men," by W. E. Robertson, superintendent of transportation, Eastern Texas Electric Railway.

"Accounting for Passenger Receipts," by W. R. Burns, assistant treasurer, Dallas Railway.

American Association News

Heavy Electric Traction

THE committee on heavy electric traction of the Engineering Association held its organization meeting in New York City on April 20. The result of the conference was a plan for compiling data and for digesting the discussion on this subject at the Rome International Railway Congress, which, by a coincidence, was in session at the same time. The New York meeting was attended by these members: Sidney Withington, New Haven Railroad, chairman; A. H. Armstrong, General Electric Company; H. W. Cope, Westinghouse Electric & Manufacturing Company; J. C. Davidson, Norfolk & Western Railway; J. H. Davis, Baltimore & Ohio Railroad, and L. S. Wells, Long Island Railroad. J. V. B. Duer (who was attending the Rome congress) was represented by Mr. Viele.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Favors Purchase Plan

55,669 Votes in Favor of Municipal Ownership—Mayor Hopeful for Future Operation

Detroit electors voted with a majority of nearly 82 per cent indorsing the Detroit United Railway purchase plan, thus ending the thirty-year traction war and again approving municipal ownership. The Detroit United Railway's city system will be taken over on May 15 as provided in Mayor Couzens' proposal and replaced by a municipally-owned system, which according to the plans of the municipal street railway officials is to be made the largest municipal ownership system in the world as well as one of the finest in the world. Because of bad weather conditions and the lack of interest on the part of some of the qualified voters, only a small vote was cast. Of the 67,912 votes polled, 55,669 were in favor of the purchase plan, giving a considerable larger percentage than the 60 per cent favorable vote required.

$2,770,000 Down Payment

In connection with the purchase plan approved, a bond issue of $4,000,000 was voted, of which $2,770,000 will be paid as a down payment on the D. U. R. when the system is turned over to the city. The remainder of the bond money will be used to purchase material and supplies which the company has on hand and which the city has agreed to purchase, and to provide working capital. Semi-annual payments of $500,000 will be made by the city until 1933 at which date the balance of the $19,850,000 will come due. Interest at the rate of 6 per cent will be paid on all of the unpaid balance. The money will go to a trust company to the credit of mortgage and bondholders of the company.

Mayor James Couzens, who has consistently maintained that the lines can be made to pay under city ownership, believes the city will be able to make its payments out of the earnings from the system and that in addition enough will be earned to rehabilitate the property. The city will not be liable in event the system fails to make enough money to meet the payments. The company interests could collect only by going into the courts and attaching the street car property. The property could be taken back in event of default on the part of the city but no collections could be made from taxes, or tax money.

On the morning of the day of transfer of the property to the city, it is planned to have every car manned by a city employee as it pulls out of the carhouse. The change is to be made with as little interruption of service as possible. Present Detroit United Railway employees will be retained except where it is necessary to cut down the force. The Mayor favors retaining all platform employees who show that they have the municipal ownership idea of giving the public the best service.

In a statement given out by E. J. Burdick, vice-president and general manager of the Detroit United Railway, he is quoted as saying that it is only fair to all concerned to state that the taking over of the property at the price paid is fully $10,000,000 below its actual present day worth. The property as it stands, he said, with a reasonable expenditure of money, can be made one of the best going-concern railroads in the country, and with this great undercapitalization and with the fact that it is a good going concern with an excellent organization, there is no reason why the city should not succeed in the venture.

He further stated that had the company in the past been given definite rights, whereby its officials could have gone to the money markets of the world and secured cash to make the reasonable extensions and betterments to the service, many of the arguments that have arisen from time to time could have been avoided. The company officials stand ready to do anything they can to facilitate the undertaking, Mr. Burdick stated.

It is cited that when the systems are combined, Detroit will have the largest municipally owned street railway in the world including 263 miles of track with 1,457 cars and all the necessary equipment.

Funds Provided for Electrification by Stock Authorization

Stockholders of the Illinois Central Railroad at their annual meeting on April 19 approved the issue of $50,000,000 of preferred stock to finance the Chicago Terminal improvement and electrification work. While no decision has been reached as yet as to the system of electrification that will be adopted, work will begin soon on the lowering of the grade from Forty-third Street to Thirty-first Street and raising the grade from Forty-third Street to Fifty-first. This work is a necessary preliminary to the electrification of the road and will require nearly two years to complete. No decision on the system of electrification will be reached until after A. S. Baldwin, vice-president in charge of the electrification work, has returned from Europe, where he has been studying recent developments in connection with trunk line electrification there. Mr. Baldwin is expected to return the latter part of May.

Check for $2,934,112 Refused by City

Maintaining its position that the companies have broken the contract ordinances, the city of Chicago on April 10 refused to accept from the Chicago Surface Lines a check for $2,934,112, representing 55 per cent of the net receipts for the year ended Jan. 31, 1922. This added to the amounts due for the two previous years makes a total of $6,526,091 which is being held until it is seen whether some compromise can be reached.

It is expected that a fight will be made on the companies' refusal to pay interest on this amount even if the principal is finally accepted. The courts have indicated that the Surface Lines have not broken the contract, and several Aldermen have insisted that the city change its attitude. This money, which now totals about $36,000,000, can be used only for transportation purposes and it is expected to be a nucleus of a subway fund.

Houston Improvements Started

The Houston (Tex.) Electric Company has started work on its program of improvements and betterments promised under its agreement with the city in return for a sixteen-year extension to its franchise. The traction company is pledged to spend $1,250,000 within the next two years. The company's first improvements will be the double tracking of the line on Lorraine Street from Gano to Maury, and work has begun on this project. Double tracking of portions of other lines will follow shortly.

The traction company will give "jobless" men who have been working for the city at $1.25 a day on Hermann Park improvements the first chance when recruiting its construction gangs. Officials of the company made this promise to Mayor Holcombe.

In addition to extensions and improvements already listed, and which have been announced in previous issues of the Electric Railway Journal, the street car company announced that it intends to purchase thirty-five new cars at once, to put into service as soon as delivered. These will cost $270,000. Besides this the company will repair and repaint thirty-six of its old cars, which have been stored in the carhouses, and put them to work.

The new car fare system also has gone into effect. Metal tokens are on sale in thirty-eight drug stores and other convenient places. Sixteen are sold for $1 or four for 25 cents. Half fare tokens are also sold thirty-two for $1. It is contemplated that tokens will be sold in other places to be added from time to time.

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Brooks-Coleman Act Held Constitutional

The Brooks-Coleman act passed by the 1921-1922 Minnesota Legislature providing for regulation of electric railway rates based on true valuations of properties was held constitutional by Judge H. D. Dickinson of the Hennepin County District Court on April 12, in denying the motion of an intervenor in a suit brought by the city of Minneapolis against the Minneapolis Street Railway. The intervenor, George H. Friend, attacked the constitutionality of the law. The judge held that neither fundamental principles of the home rule government of the city nor the constitution of either the state or the United States had been infringed upon by the law. The decision is similar to those handed down previously in Ramsey and St. Louis Counties, at St. Paul and Duluth. John M. Rees, counsel for Mr. Friend, indicated that the case would be taken to the Supreme Court.

In his opinion the judge said that it is to be noted, contrary to popular misconception, that the act does relieve the city of a general control and supervision of the operation of the railway lines. Full plenary powers are reserved to the City Council. The subjects upon which the State assumes control are limited to rate making, supervision of stock and bond issues and the determination of property valuations for certain purposes.

The State Supreme Court has sustained the validity of a similar act by which all local franchises to telephone companies are surrendered and brought under state control through the Railroad & Warehouse Commission. The whole subject is one wherein the Legislature is supreme. The question of state control of public utilities is one of public policy entirely.

Supplementary Report in Paving Case

A supplementary report was issued by the Public Service Commission of Pennsylvania on Nov. 22, 1921, in the paving case of the borough of Swarthmore against the Philadelphia Rapid Transit Company, referred to in the ELECTRIC RAILWAY JOURNAL for April 1, page 573. Subsequent to the presentation of the original report in this case, the time during which the order should be held in abeyance was extended, on the petition of the borough, in order that a full opportunity might be afforded the parties to consider and act on the recommendations therein made. In November the commission was advised by the municipality, through its solicitor, that it had decided it would be unwise for it to accept such recommendations, and also that the borough had not adopted any program of highway improvement with respect to Yale Avenue. In consequence of these developments the commission is of the opinion that further consideration of any change in the character of the pavement was a matter that should await the action of the municipality with regard to the portion of the highway not occupied by the respondent.

The suplementary order of the commission follows:

It is further ordered, That the respondent, Philadelphia Rapid Transit Company, generally maintain and keep in repair that portion of Yale Avenue in the Borough of Swarthmore which lies between its rails and to the end of its ties, so as to be at all times safe to the public and to the employees and patrons of the utility, and so as to make a smooth riding surface over the same for vehicles.

It is further ordered, That the Philadelphia Rapid Transit Company shall not pave or maintain that part of Yale Avenue in the Borough of Swarthmore outside of the railway strip, nor do any other thing specified to be done by it in the ordinances referred to in the commission's original report, nor shall said company pay for the doing of such things by advancement, reimbursement or otherwise unless this commission shall first find and determine that such work or payment shall not prevent or unduly interfere with the ability of the said Philadelphia Rapid Transit Company adequately to perform and properly to meet the duties and liabilities imposed on it by the public service company law.

Terms of Bill Reviewed Authorizing Service-at-Cost

Governor Miller of New York, as noted in the ELECTRIC RAILWAY JOURNAL for April 15, has signed the act to amend the public service commission law to define service-at-cost contracts. Under the law as changed municipal corporations having a population of less than 1,000,000 inhabitants and street surface railways are authorized to enter into service-at-cost contracts and the Public Service Commission is authorized to approve and validate such contracts. The provisions of the measure follow:

Section 1. Section forty-nine of chapter four hundred and eighty of the laws of nineteen hundred and ten, entitled "An act in relation to the public service commission and the transit commission, constituting chapter forty-eight of the consolidated laws," as added by chapter one hundred and thirty-four of the laws of nineteen hundred and twenty-one, is hereby amended by adding thereto subdivisions nine, ten and eleven, as follows:

9. Service-at-cost contract defined. A service-at-cost contract is an agreement between a municipal corporation and a street surface railroad corporation, providing generally for operation of a street surface railroad wholly or partly within the limits of such municipal corporation, with a rate of fare directly or indirectly dependent upon the excess of revenues after deductions for operating expenses, maintenance, taxes, allowances for renewal and depreciation and a return on the value of the property used and useful in the service rendered.

10. Authority to enter into service-at-cost contracts. All municipal corporations and street surface railroad corporations now existing or which may hereafter exist have and shall have power to enter into service-at-cost contracts as herein defined.

11. Approval of service-at-cost contracts by public service commission. Any party to a service-at-cost contract, as herein defined, upon ten days' written notice, served in the manner provided by the civil practice act for the service of a summons, to the other party or parties to such contract, may present such contract to the public service commission for its approval. The public service commission shall have the power to approve such contract and any agreement purporting to be such a contract, if entered into between the proper parties subsequent to the first day of July, nineteen hundred and twenty, so presented to it upon filing proof of service of notice of presentation as hereinbefore provided. Upon approval by the public service commission, every such contract is and shall be valid and binding as between the parties thereto as of, from and on the day of the date of the execution thereof, in all respects and for all purposes therein expressed, and no provision of any law, general or special, unless the contrary effect shall be specifically stated in any general or special law which shall hereafter take effect, shall or be deemed to interfere with or affect such service-at-cost contract or any provision thereof, or the performance and carrying out of such contract and each and every provision thereof. The execution of any such existing service-at-cost contract and all acts thereunder are, upon the approval of such contract by the public service commission, validated.

Sec. 2. Application of act. This act shall apply only to municipal corporations having a population of less than one million inhabitants according to the last preceding federal census, anything to the contrary herein notwithstanding.

Sec. 3. This act shall take effect immediately.

Philadelphia Dividends to Employees to Go Into Common Dividend Fund

On April 6 the employees of the Philadelphia (Pa.) Rapid Transit Company, speaking through their elected representatives, enthusiastically indorsed President Mitten's suggestion that the entire 1922 co-operative wage dividend be deposited in a common investment fund, each depositor sharing its earnings in proportion to the amount of his savings so invested.

Following the convention of committeemen opportunity was immediately afforded all employees to express their approval of the action of their representatives by signing authorizations empowering the trustees of the co-operative wage dividend fund to proceed forthwith along the lines proposed by the president.

Within forty-eight hours more than 99½ per cent of the full personnel of the system had gone on record in approval of the new idea.

In urging the men to the action they have now taken Mr. Mitten said:

Just as I formerly counseled you to deposit your extra wage with the saving fund, so I now urge upon you to turn over the co-operative wage dividend, when paid, to a committee of your own selection, consisting of four trustees who, with the co-operative council, should be empowered to act for you.

The co-operative wage dividend in the hands of your committee should, of course, be subject to withdrawal by any employee who leaves the service, the same as in the saving fund, and in case of death should be paid to the family. Similarly, income derived from investment made with this fund should be distributed to you in cash, by the committee.

We are preparing ourselves to act as principals, so that we may participate in profits. To do this, we must keep our co-operative wage fund together, so as to be able to speak with the authority of capital. We must be prepared to take the risk that capital takes in making investment, excepting that our risk will be less, for capital, in making its investment, never knows how far it may safely depend upon labor.

Capital has always spoken authoritatively because of its money power. Men and management, with capital added, are stronger than is capital standing alone. We here, by keeping our co-operative wage dividend undivided, can together, as time passes, more and more effectively function as a principal in the hiring of capital, as against the heretofore universal practice of capital hiring labor.

More Turnstiles Ordered. — The New York Transit Commission has given permission to the Interborough Rapid Transit Company to install 430 additional turnstiles in its subway stations. The Brooklyn Rapid Transit Company has also received permission to install twenty-nine turnstiles of a different type.

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Hearing on the Bacharach Bill Next Week

The House judiciary committee will hold a hearing on April 25 on the Bacharach bill, limiting the jurisdiction of federal courts over the orders of the public service commissions. From indications the hearing will be well attended, many mayors, governors, public service commissioners and other state and city officials having signified their intention of being present.

In addition, representatives of numerous bar associations and public utility corporations are expected to testify against the measure. If enacted into law, public utility companies will lose the right of appeal to the federal courts and must look to state courts for relief from oppressive orders of public service commissions. The prospects for the passage of such a law are regarded as rather dubious by official Washington. The terms of the measure were referred to in the ELECTRIC RAILWAY JOURNAL for April 8, page 607.

Railway Employees Must Be Their Own Representatives

C. A. Smith, general manager of the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, recently sent formal notice to the employees that when the existing wage contract expired on May 1 the company would not deal with outsiders in the discussion of a new contract. The letter follows:

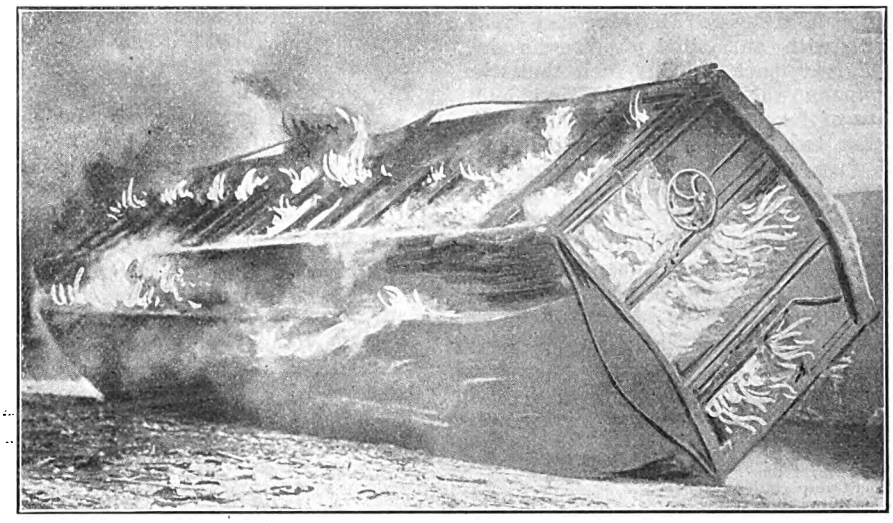
You are hereby notified by the Steubenville, East Liverpool & Beaver Valley Traction Company as follows:

1. That on May 1, 1922, at midnight the existing contract under which you are now employed by this company will terminate.
2. That this company refuses to be further bound by any of the provisions of the agreement under which you are now employed by it.
3. That with respect to the further employment of yourself, this company will take up and discuss such further employment with you, or with you and other employees representing yourself or yourself and others constituting the whole number of employees of this company or any part or group thereof at any satisfactory time which discussion may be had with C. A. Smith, but no discussion will be had with any officer or representative of any so-called labor union as the representative of such a labor union.

You are invited at your earliest convenience to take up the matter of further employment with this company as it is the belief of this company that a satisfactory basis for your further employment can be agreed upon.

1,850 Old Cars Scrapped and Burned at Boston

Until recently it had been a frequent comment of visitors to Boston that more old style street cars were in evidence there than in any other city of the country. But the last two years of trustee management, with a fare unit adequate to write off obsolete equipment, has changed all that. From July 1, 1919, to Dec. 31, 1921, 1,850 old cars of the Boston Elevated Railway have been scrapped and consigned to the flames of a gigantic funeral pyre at the Forest Hills yard. Rolling stock of modern type has replaced these old cars.



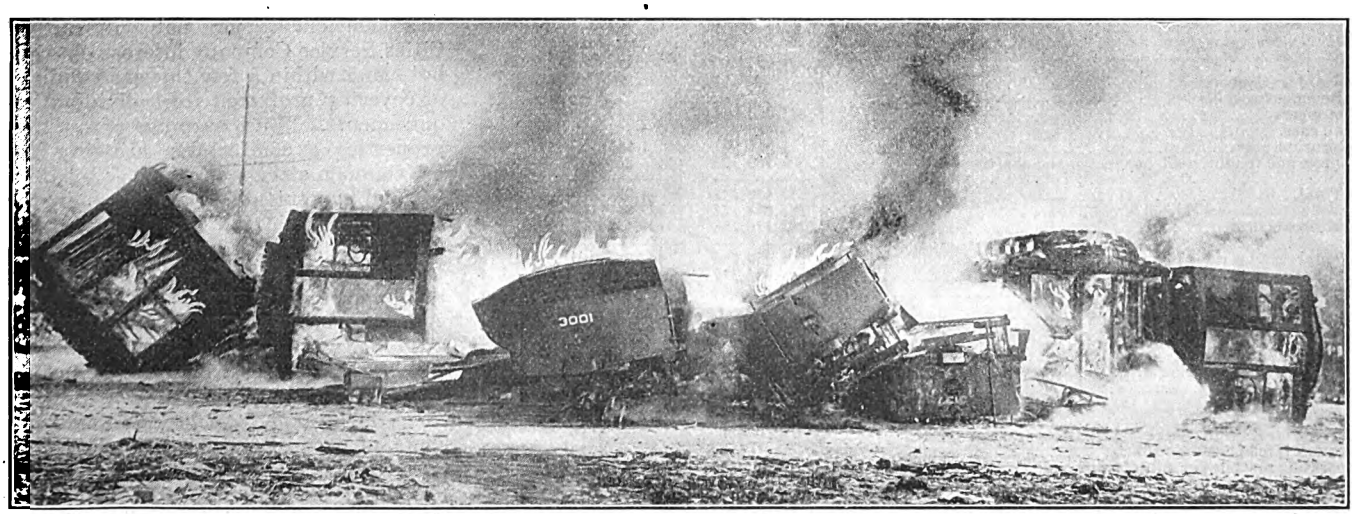
CLOSE-UP OF "L" CAR IN FLAMES

Under the strict regulations of the Massachusetts laws and the supervision of the commission, a street railway may not scrap any physical property without writing it off out of earnings. This necessarily involves the use of an actual cash depreciation charge against earnings and few of the companies have been financially able to charge off the value of obsolete cars. Consequently they have had to keep them. It is only within the last two years that the Boston Elevated has been able to rid itself of the burden of depreciated and inefficient rolling stock.

Most of these old cars had seen twenty-five years of service, and not a few of them three decades. Some were originally horse cars, which were spliced together and equipped with motors when electricity displaced the straining steeds of the '80s. Among the cars destroyed were fifty of the first wooden rapid transit cars used on the elevated lines.

The surface cars destroyed were single and double-truck box cars, 25 and 30 ft. types respectively, also a number of single and double-truck open cars. In their stead, center-entrance multiple-unit cars operated singly and in trains of two and three units are now in service. The company also has put a number of standard one-man safety cars in use in the suburbs.

Before being sent to the Forest Hills yard, the cars to be destroyed are stripped of everything of any possible value, all copper and brass trimmings being removed. After the conflagration, the ashes are raked for iron and metal scrap, which is stored until a favorable opportunity for sale occurs.



CARS BEING BURNED IN BATCHES IN BOSTON

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Financial and Corporate

Surplus in Cleveland

Continuous Decrease in Riding with the Maximum Rate of Fare—Increase of Stockholders

According to the annual report of John J. Stanley, president of the Cleveland (Ohio) Railway, the company during 1921 earned expenses, taxes and interest. The number of passengers decreased greatly, but the city lessened the service and the company was able to give the service demanded without suffering a loss. Finishing the year 1921 with an actual profit was due in great part to the fact that the company was collecting the maximum rate of fare under the Cleveland ordinance, to adjustments made in the rates of fare collected in other municipalities, wage reductions in all departments, a lowering of the cost of materials and the slight improvement in general business conditions. The report was referred to in the ELECTRIC RAILWAY JOURNAL in the issue of Feb. 11, page 252.

At the close of the year there were 5,808 stockholders, an increase of 277 over 1920. Of this number 5,219 were residents of the state and 3,935 of the county. The report says that the range of prices of the company's stock on the Cleveland Stock Exchange for the past three years, while not indicative of the value of the stock, does emphasize the duty of the city to take some action that will place the market value of the stock above par and maintain it there. In 1919 the range was from 97 to 102; in 1920 from 87 to 100⅜, and in 1921 from 84½ to 93¼. The last sale during 1921 was 86.

The betterments during 1921 were so small that they could be paid for with the money realized from the retirement of obsolete property or, in two instances, paid for by private individuals interested in having them made. In the matter of track renewals the company made a record, completing 28.6 miles of track, the largest amount in any year on this system.

On Jan. 1, 1921, the wages of employees in the maintenance of way department were reduced approximately 20 per cent and employees in the maintenance of equipment department were reduced 10 per cent. On Feb. 1 the wages of all employees except those in the train service and in the above-mentioned departments were reduced 10 per cent. At the same time a bulletin was addressed to the trainmen announcing a reduction of 15 cents per hour and the elimination of all spread and overtime rates. This was followed in March by counter demands of the men and by a series of conferences with their committee during April, but an agreement was reached without recourse to arbitration or without any serious controversy. A new wage scale with the conductors and motormen was made effective on May 1 last which is substantially a 20 per cent decrease over the previous wage scale.

Mr. Stanley quoted at length from a report of City Street Railroad Commissioner Fielder Sanders made to the City Council on Dec. 14, which is a historical review of the past six years of operation and "should be of especial interest to every stockholder for its analysis of the financial and service conditions of the company."

In conclusion Mr. Stanley referred to the death of Henry J. Davies and gave a brief sketch of the man who he said was an authority on the accounting for street railways and on insurance in connection with street railways.

INCOME ACCOUNT THE CLEVELAND RAILWAY BASED ON ACTUAL EXPENDITURES

	1921	1920	Per Cent Change
Passenger revenue*	$17,336,685	$17,072,999	1.5
Other transportation revenue	81,536	130,668	—37.7
Other railway operations	189,497	178,691	— 6.1
Total operating revenue	$17,607,718	$17,382,358	1.3
Way and structures	2,013,810	2,109,294	— 4.5
Maintenance car equipment	1,723,407	1,949,887	—11.6
Maintenance power plant	75,630	59,021	28.1
Power operation	1,399,515	1,652,874	—15.3
Conducting transportation	6,037,904	7,042,945	—14.3
General and miscellaneous	2,171,286	2,252,030	— 3.6
Obsolete property	494,361	498,000	— 0.7
Total operating expenses	$13,915,913	$15,564,051	—10.6
Net operating income	3,691,805	1,818,307	103.1
Taxes	1,181,144	1,082,185	9.1
Operating income	$2,510,661	$736,122	241.0
Non-operating income	190,229	174,196	9.2
Gross income	$2,700,890	$910,318	196.9
Interest and dividends	2,100,732	2,101,239	—0.02
Surplus	$600,158	$1,190,921 (d)	150.5

(d) Deficit.
* Includes employees' passes.

STATISTICAL INFORMATION THE CLEVELAND RAILWAY

	1921	1920	Per Cent Change
Miles of track operated	411.41	412.71	— 0.3
Revenue car-miles—			
Motor cars	31,010,697	33,634,735	— 7.8
Trail cars	4,585,813	5,791,397	—20.4
Interurban cars	1,338,195	1,462,086	— 8.5
Express and freight, mail, newspaper and chartered cars	183,522	203,022	— 9.6
Total	37,118,227	41,091,240	— 9.6
Revenue passengers carried	286,844,527	327,840,438	—12.5
Transfers collected	109,110,258	120,156,602	— 9.2
Total revenue rides	395,954,785	447,997,040	—11.6
Employees fares	948,717	817,409	16.1
Deadheads	2,526,164	2,111,228	19.7
Total rides	399,429,666	450,925,677	—11.4
Rides per car-mile	10.761	10.974	— 1.9
Passenger revenue			
From cash fare passengers	$16,340,105	$15,970,086	2.3
From transfers	937,161	1,057,437	—11.4
Total	$17,277,266	$17,027,523	1.5
Average fare in cents per revenue passenger*	6.02	5.19	16.0
Average fare in cents per ride	4.34	3.78	14.8
Operating revenue per mile of track	$42,894	$42,117	1.8
Operating ratio	79.1	89.2	—10.1
Taxes, per cent of operating revenue	6.72	6.24	0.48

* Including employees' fares.

Cities Service Utility Properties Do Well

The annual report of the Cities Service Company, New York, N. Y., for 1921, shows net earnings of $10,846,585. This was 2.23 times the preferred dividend and after deduction of the preferred dividend was equal to $13.04 earned on the average common stock outstanding, as compared with $43.09 in 1920. Gross earnings last year were $13,461,770, as compared with $24,698,039 in the preceding year. Current liabilities were reduced $13,375,000.

The earnings of the public utility properties increased 50.8 per cent, or from $4,609,912 to $6,918,741. This was sufficient to pay not only all of Cities Service Company interest charges but came within a few thousand dollars of covering preferred stock dividend requirements. With earnings from oil properties a comfortable showing for the common stock was made.

Total current assets as shown in the balance sheet in the report were $42,438,113, as compared with total current liabilities of $18,532,347, leaving an ample working capital of $23,905,766. Accumulated earnings which have not been declared as dividends are shown as $47,013,011. During the year 11,565,993 barrels of oil were produced, and the company sold 86,133,082,000 cu.ft. of natural gas, 5,849,050.310 cu.ft. of artificial gas, 647,751,497 kw.-hr. of electrical energy and 95,274,280 passengers were carried on its electric railways.

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Reorganization Terms Made Public

First Mortgage Bondholders Must Furnish New Cash to Participate in New Company

The Northampton (N. J.) Traction Company as the owner of the stock of the Northampton, Easton & Washington Traction Company, Easton, Pa., is apparently eliminated from participation in the reorganization of the company under the tentative plan which has been drawn by the committee representing the first mortgage bondholders. According to the members of that committee the operation of the Northampton, Easton & Washington Traction Company has shown that it cannot as now constituted earn money sufficient to pay fixed charges on the amount of bonds now outstanding and that it would be unwise again to place upon the company operating the property a burden of fixed charges in excess of any amount which can surely be earned.

In consequence the committee has proposed to allot to the present first mortgage bondholders that portion of the earnings only which remains after payment of operating expenses and taxes and necessary prior fixed charges and after setting aside proper amount for maintenance and depreciation. In order to accomplish this, an income bond has been decided upon as providing perhaps the best means to the end which the members of the committee have in mind.

It is the intention of the committee that the property shall be bid in in its behalf at the foreclosure sale. A new company will then be organized to which the entire property will be conveyed. In reorganizing it will be necessary to raise new money to pay for improvements, refunds, receivers' certificates, and to pay expenses of the committee. As the committee considers it impossible to raise such money from outside sources, the present bondholders will be called upon to subscribe to an issue of $100,000 of 7 per cent first mortgage bonds. Each bondholder will subscribe to an amount of these bonds equal to 20 per cent of his present holdings. In other words, each depositor of a $1,000 bond will subscribe for $200 of new 7 per cent bonds, for which he will pay $180.

The proposed authorized capitalization of the new company will consist of $1,000,000 of first mortgage 7 per cent bonds, $536,000 of 4 per cent sinking fund income bonds and 2,000 shares of stock of no par value. The amount of securities to be issued at this time will consist of $100,000 of first mortgage 7 per cent bonds, $444,000 of 4 per cent sinking fund income bonds and 2,000 shares of no par value stock.

The 2,000 shares of no par value stock will be held by the committee representing the bondholders. Each assenting depositor will receive for each $1,000 bond and $180 in cash, $1,000 of sinking fund 4 per cent income bonds and $200 of first mortgage 7 per cent bonds. No rights to the income bonds will accrue to any bondholder who does not subscribe for the new first mortgage 7 per cent bonds.

Control of Stark Electric Changes Hands

Purchase of a majority of the stock of the Stark Electric Railroad, Alliance, Ohio, has been made by a syndicate from Alliance and vicinity. The deal, which has been under consideration for several months, was concluded during the week ended April 8. The following Alliance men are interested: W. H. Purcell, F. E. Dussell, A. A. Reeves, S. L. Sturgeon, F. A. Graves, F. A. Hoiles, M. S. Melbourne, A. L. Atkinson, W. E. Davis, E. B. Webb, O. F. Transue, W. H. Ramsey, B. F. Weybrecht, G. R. Floyd and J. F. Heacock. The control of the road has been held by Cleveland capitalists since the organization, twenty years ago.

The Stark Electric Company was organized in 1903. It took over the Alliance Street Railway, the oldest electric road in the country. It first operated a line between Alliance and Canton, and shortly afterward extended the line to Salem. The company at present operates 34 miles of roadway. It owns its own right-of-way except in Alliance and the loop at Canton. The power plant of the company is located at Lake Park east of Alliance.

Renaming and Refinancing

In arranging the refinancing of the Hagerstown & Frederick Railway, Frederick, Md., to meet obligations maturing this year, the name will be changed to the Potomac Public Service Company. Because of its operations extending now into Virginia and West Virginia it is desired to have a corporate name more in keeping with the company's activities and to bring about a closer combination of all its various subsidiaries into one big corporation.

In its new refinancing Hambleton & Company, Baltimore, and E. H. Rollins & Sons, New York, N. Y., will offer $2,155,000 of the company's first and refunding mortgage 7 per cent sinking fund gold bonds, dated April 1, 1914, and due April 1, 1944. The bonds are offered at 100 and interest yielding 7 per cent.

The bonds are part of an authorized issue of $10,000,000 and there will be outstanding after this issue $4,855,000. The bonds are redeemable on any interest date at 107½ up to 1935 and at 2½ less in each succeeding five-year period. The Potomac Public Service Company will have a capitalization of $1,512,950 in common stock and $1,625,000 in preferred, which will be used to take over the stocks of its predecessor corporation.

New Directors for Quebec Company

The board of the Quebec Railway, Light & Power Company, Quebec, Que., was largely changed at the annual meeting following the election of E. A. Robert, president of Montreal Tramways, to the presidency. Lorne C. Webster, retiring president, took the vice-presidency and other directors are George E. Amyot, Quebec; Adelard Turgeon, Quebec; D. O. Lesperence, Quebec; J. N. Greenshields, Montreal; H. G. Valiquette, Montreal; Col. J. E. Hutcheson, Montreal; K. B. Thornton, Montreal, and A. C. Barker, New York, and C. G. Greenshields, Montreal. Shareholders approved a by-law making the $100 par value common stock no par value.

Conspectus of Indexes for April, 1922

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	April 1922 7.14	March 1922 7.14	April 1921 7.22	May 1920 7.24	4.84
Street Railway Materials*	March 1922 156	Feb. 1922 156	March 1921 181	Sept. 1920 247	100
Street Railway Wages*	April 1922 213	March 1922 214	April 1921 231	Sept. 1920 232	100
Steel Unfilled orders (Million tons)	Mar. 31 1922 4.49	Feb. 28 1922 4.14	Mar. 31 1921 6.28	Apr. 30 1917 12.18	5.91
U.S. Bank Clearings Outside N. Y. City (Billions)	March 1922 12.26	Feb. 1922 10.16	March 1921 12.37	March 1920 18.54	Av. Mo. 1913 6.12
Business Failures Number	March 1922 2,317	Feb. 1922 2,072	March 1921 1,500	Jan. 1922 2,722	Av. Mo. 1913 1,213
Liabilities (millions)	57.51	66.92	68.70	105.7	24.64

	Latest	Month Ago	Year Ago	Peak	1913
U.S. Bur. Lab. Stat. Wholesale Commodities	March 1922 152	Feb. 1922 151	March 1921 162	May 1920 272	100
Bradstreet's Wholesale Commodities	Apr. 1 1922 11.53	March 1 1922 11.60	Apr. 1 1921 11.37	Feb. 1 1920 20.87	9 21
Dun's Wholesale Commodities	Apr. 1 1922 166.3	March 1 1922 169.7	Apr. 1 1921 174.4	May 1 1920 263.3	120.9
Annalist Wholesale food	Apr. 15 1922 182.7	Mar. 18 1922 182.6	Apr. 16 1921 181.9	June 12 1920 329.2	140
U.S. Bur. Lab. Stat. Retail food	March 1922 139	Feb. 1922 142	March 1921 156	June 1920 219	100
Nat. Ind. Conf. Bd. Cost of living	March 1922 154.7	Feb. 1922 157.7	March 1921 168.7	July 1920 204.5	(1914) 100

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over, except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on street and interurban railways in the United States.

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Chicago Surface Lines Has Biggest Year

Earnings Largest in History of Companies—Decrease in Riders Small Compared with Other Cities

The report of the Chicago Surface Lines for the fiscal year ended Jan. 31, 1922, discloses gross and net receipts greater than any earned heretofore in the history of the company. The figures are shown in the accompanying table. One of the notable things about the business of the Chicago Surface Lines has been that during the year 1921, when the traffic on many electric railway systems fell off very materially, riding in Chicago decreased only 2.4 per cent as compared to the total number of riders in the previous year. Another interesting item brought out in regard to traffic is that since 1910 the increase in the number of revenue passengers on all of Chicago's urban transportation systems has been 56.4 per cent, and of this increase 91.52 per cent has been on the surface lines.

In addition to the financial statement of the companies, the report touches very briefly on many operating matters. On the subject of employing trainmen it is pointed out that during the year 10,810 men applied for train service. Of these 4,808, or 45 per cent, were allowed to file applications; of these, 1,114 were tentatively accepted as students, and of these, ninety-eight were rejected by medical examination. A tabulation is included which shows that 101 employees have been in continuous service with the company for forty years or over, 198 for thirty-five years or over, 447 for thirty years or over, and 481 for twenty-five years or over, making a total of 1,227 employees who have been with the company more than twenty-five years.

On July 28, 1921, the department of schedules and time tables was organized as a unit independent of the transportation department and reporting directly to the general manager. The work of this department is to make and revise the time-tables for the ninety-three different lines, nearly all of which require separate time-tables for week days, Saturdays, Sundays and holidays. During the year this department rewrote and revised 200 schedules for various purposes.

On the effect of the skip stop on power consumption, the report states that from studies made by the electrical department, it appears that the power saving due to the skip stop is from 15 to 18 per cent, and that if the skip-stop plan were eliminated, the company would not be able to operate the cars without additional power generating, transforming and transmitting equipment.

The power purchased from the Commonwealth Edison Company during the year amounted to 540,446,679 kw.-hr. The cost of this purchase power was $4,046,272. The total direct-current output at substations and power houses was 496,246,165 kw.-hr., the cost of which, including maintenance, fixed charges and purchased power, amounted to $4,459,102. The highest direct-current peak encountered was for 461,100 amp. on the morning of Jan. 24, 1922.

Another interesting item in the year's review is the mention that Marsh & McLennan were appointed general insurance brokers for the company and a $50,000,000 blanket insurance arranged on a new general form covering all buildings and their contents actively used in the operation of the road and all rolling stock, except the Seventy-seventh Street shops. A $3,000,000 Mutual Insurance Company policy was continued in force on these shops and their contents and rolling stock. A specific insurance policy of $2,579,613 was placed on buildings and their contents not used in the operation of the road.

The legal expense of the company during the year amounted to 2.87 per cent of the gross earnings, as compared to 3.28 per cent during the previous year.

CHICAGO SURFACE LINES — EARNINGS, EXPENSES AND DIVISION OF RESIDUE RECEIPTS FOR TWELVE MONTHS ENDED JAN. 31, 1921 AND 1922

Earnings	1920–1921	1921–1922
Passenger cars	$54,726,740	$59,706,413
Chartered cars	11,591	12,121
Newspaper cars	15,745	16,161
Freight earnings	3,234	2,319
Hospital car service	2,734	4,194
Advertising	240,957	247,184
Rents of buildings, etc.	93,642	106,479
Sale of power	98,104	92,371
Interest on deposits	112,530	137,939
Miscellaneous	22,108	18,553
	$55,327,385	$60,343,734
Expenses		
Way and structures	$2,859,901	$3,040,940
Equipment	4,015,806	4,348,373
Renewals	4,167,327	4,827,499
Power—maintenance	337,093	320,376
Power—operation	3,105,975	3,128,792
Conducting transportation—trainmen	20,475,132	21,574,699
Conducting transportation—other	3,023,872	3,208,603
Traffic	9,577	34,547
General and miscellaneous —damages	1,930,000	2,271,224
General and miscellaneous —other	1,645,711	1,568,098
Taxes	1,730,000	2,193,000
Total expenses	$43,300,393	$46,516,151
Residue receipts	*$12,026,992	*$13,827,583
Divided		
Chicago Railways	*$7,216,195	*$8,296,550
South Side Lines	*$4,810,797	*$5,531,033

* Includes city's 55 per cent of net divisible receipts, as defined by ordinances.

More Passengers in Boston—General Results Better

The Boston (Mass.) Elevated Railway carried 1,193,657 more revenue passengers last month than during March last year, and revenues exceeded cost of service by $204,332.

During March the total revenue was $2,868,518, while in the same month last year it was $2,991,780, a decrease of $123,262.

The total cost of service last month was $2,664,186, as compared with $2,790,932 in March, 1921.

On April 1 the balance in the reserve fund created under the public control act was $919,863. The Elevated trustees expect that by May 1 this reserve fund will be restored to its original total of $1,000,000, and after that all receipts over cost of service must be paid over to the State to be distributed to the cities and towns that contributed to the loan assessment in 1919.

The number of 10-cent passengers carried last month was 24,765,577 as compared with 28,548,059 in March a year ago, but this loss was more than made up by the gain in 5-cent passengers, which were 6,130,322 last month and 1,147,316 in March, 1921. The grand total of revenue passengers last month was 30,895,899 and in March last year it was 29,695,375.

It is stated that the receipts from fares per revenue passenger last month were 9.005 cents and the total cost of service was 8.623 cents. Last year in March these figures were 9.804 cents and 9.399 cents, respectively.

CHICAGO SURFACE LINES
For the Fiscal Year Ended Jan. 31

Rate of Fare	1915 5 Cents	1918 5 Cents	1919 5 Cents	1920 5 Cents 2- 1-'19 to 8- 7-'19 7 Cents 8- 8-'19 to 11-30-'19 7 Cents, 6½ Cents, 6 Cents 12- 1-'19 to 12-26-'19 6 Cents 12-27-'19 to 1-31-'20	1921 6 Cents 2-1-'19 to 6-30-'19 8 Cents 7-1-'20 to 1-31-'21	1922 8 Cents
Revenue passengers	627,731,550	692,815,889	685,300,718	743,746,584	769,025,413	750,515,622
Passenger receipts	$31,324,038	$34,566,601	$34,186,578	$43,417,639	$54,726,740	$59,706,413
Total earnings	31,966,046	35,114,633	34,710,098	43,963,438	55,327,385	60,343,733
Operating wages	10,560,039	12,854,406	14,768,089	19,854,174	28,204,342	29,676,981
Other operating expenses and taxes	9,329,236	10,247,289	10,963,848	13,399,841	15,096,051	16,839,168
Residue receipts	12,076,773	12,012,937	8,978,161	10,709,423	12,026,992	13,827,583
Less: Joint account expenses	311,894	648,206	478,831	181,862	164,733	449,000
	$11,764,879	$11,364,732	$8,499,329	$10,527,561	$11,862,259	$13,378,583
5 Per cent on purchase price	7,113,273	7,661,543	7,802,574	7,893,292	7,974,289	8,024,104
55 Per cent to city	2,558,384	2,036,754	383,215	1,448,847	2,138,383	2,944,963
45 Per cent to companies	2,093,223	1,666,435	313,540	1,185,421	1,749,586	2,409,515

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Tennessee Plan Announced

Bankers Outline the Conditions Under Which Chattanooga and Nashville Properties Will Be Consolidated

Steps are being taken toward the formation of the Tennessee Electric Power Company to effect a consolidation of the companies controlled by the Tennessee Railway, Light & Power Company with the Chattanooga & Tennessee River Power Company. The properties of these companies have been operated as one system, and it is now proposed to bring them together as nearly as possible into one ownership.

The bankers concerned in the refinancing state that a sound basis will thus be provided for the funding of current floating debt and for the permanent financing of necessary improvements and extensions to the several properties as required to take care of their growing business. They explain that the first problem presented in making the necessary financial arrangement is to care for the large bonded indebtedness of the present operating companies.

Holders of the Tennessee Power Company's 5 per cent bonds, Nashville Railway & Light Company refunding and extension 5 per cent bonds and Chattanooga Railway & Light Company 5 per cent bonds are being offered their choice of several options in exchange for their bonds. When it is known to what extent such exchanges can be accomplished a supplementary plan will be submitted to the preferred and common stock holders of the Tennessee Railway Light & Power Company, stating the terms on which they may acquire the available securities of the new company in exchange for their preferred and common stock.

Tentative arrangements have been made, conditioned on the plan being declared operative, for the sale of first and refunding bonds of the new company for cash to investment bankers not heretofore identified with any of the properties.

It is explained that the Tennessee Railway, Light & Power Company controls the Tennessee Power Company, the Chattanooga Railway & Light Company and Nashville Railway & Light Company. Each of these companies has a floating debt, in some cases large, incurred for necessary betterments and improvements, for which it has been impossible to provide through sale of long-term securities. Because of the inability of these companies to finance their requirements, the Tennessee Railway, Light & Power Company has made large advances to them, borrowing the money for the purpose and pledging as collateral the bonds and stocks of the subsidiary companies held in its treasury, and these obligations have been renewed from time to time.

On or before June 1 next there will mature obligations of this company amounting to $3,561,000, and as collateral practically all of its assets are pledged. In addition the subsidiary companies have unfunded obligations amounting to $2,515,907 as of March 1, 1922, nearly all of which mature on or before June 1 next. It is further explained that under the circumstances it is imperative that steps be taken not only to provide for the present obligations of all of the companies, but also to remove the dangers of temporary financing by making provision for permanent financing of the necessary improvements and extensions to the several properties as required to take care of their growing business.

As a result of the careful study of all the conditions the best solution, so the bankers state, is a thorough readjustment of the securities of the company and its subsidiaries and the consolidation of them as outlined in the proposed plan. The details of the basis of exchange of the various securities are, of course, of interest primarily to the holders of the various securities of these companies. The capitalization of the proposed new Tennessee Electric Power Company would be divided as follows: Bonds, $32,947,500; preferred stock, $7,914,700; second preferred noncumulative stock of no par value, 50,000 shares; no par value stock, 150,000 shares.

Taxes Being Paid Up in Muskegon

Forty-three thousand dollars in back taxes will be paid on the installment plan by the Muskegon Traction & Lighting Company, Muskegon, Mich. The company has already paid $2,000 on account and its installments will be based on the revenue, it is announced by George Steinwedel, president and general manager. He hopes at least to continue the $2,000 monthly payments as the revenue is increasing.

Owing to bus competition the company lost money in the operation of its cars for two years. It then asked the Michigan Utilities Commission for permission to quit. The state commission made the order but suggested that Muskegon and Muskegon Heights, the two cities served, first vote whether they wanted railway or jitney service. Following a spirited campaign the cities voted four to one for street cars.

The company had been unable to pay its personal property taxes for two years and as soon as the revenue started to increase it decided on the installment plan. Figures submitted showed the buses on competing lines had taken $80,000 revenue from the railway.

The company is charging a 10-cent cash fare with four tickets for 30 cents.

Last February was the first month in more than three years that the company was able to meet both operating charges and interest. For two years the company is said to have failed by $50,000 to earn operating expenses.

There had been a marked feeling against the corporation in the two cities, but this sentiment quickly underwent a change when the company asked permission to discontinue service.

Financial News Notes

Opposes Abandonment.—The Bridgeton City Council has adopted a resolution opposing the expressed determination of the Bridgeton & Millville Traction Company, Bridgeton, N. J., to abandon its lines at Bridgeton on July 1 because of the heavy losses sustained.

Receiver Named.—Joseph A. Yager has been named receiver of the Toledo & Western Railroad, Toledo, Ohio. The matter was decided by Federal Judge Killits, acting on the petition of attorneys representing the company's stockholders. He will work with the other receivers, J. Frank Johnson and Harry A. Dunn.

Another Step Taken Toward Reorganization.—The Chicago, Aurora & Elgin Railroad, Aurora, Ill., has applied to the Illinois Commerce Commission for permission to issue $11,000,000 of common stock for the purpose of acquiring the properties of the Aurora, Elgin & Chicago Railroad under the reorganization plan.

Foreclosure Step Confirmed.—Grayson M. P. Murphy, chairman of the committee representing the holders of the 4½ per cent bonds of the Interborough-Metropolitan Company, has confirmed the report that these bondholders are about to take steps for acquiring by foreclosure the $33,912,000 of Interborough Rapid Transit Company stock which since 1918 has been held as security for the bonds.

Passenger Decrease Noted.—For the three months ended March 31, 1922, the Philadelphia (Pa) Rapid Transit Company, after deducting charges, realized a net income amounting to $614,831, against $364,547 for the same period in 1921. There was a decrease in the traffic from 207,961,020 total passengers for the first three months of 1921 to 202,286,650 for the first three months of the present year. The decrease in passenger revenue was $386,398.

Prospects for Reorganization Better.—Receiver George Whysall said recently that he had been advised by Judge Merle Walker, Indianapolis, and Guy L. Emerson, Chicago, who represent the bondholders, that they are meeting with thorough co-operation in working out plans for refinancing and reorganization of the Springfield, Troy & Piqua Traction Company, Springfield, Ohio. They expect to be in a position to make a complete report within the next few weeks. At present the line is only in partial operation. Residents along the line have expressed themselves as willing to help in the refinancing move. The Erie Railroad in the past has been used by the road to transfer passengers and freight to and from Sprigfield and its nearest connection, 2 miles distant.

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Traffic and Transportation

Petition for Fare Rehearing Denied

The Illinois Commerce Commission on April 14 denied the petition for a rehearing filed two days before by the Chicago Surface Lines in the 6-cent fare case. The companies have until April 30 to make their next move. It was expected they would seek protection in the courts against enforcement of a rate which they consider confiscatory.

The petition of the companies for a rehearing attacked every conclusion reached by the commission. They contended that the 5 per cent return allowed by the commission would be insufficient to meet even the interest on the outstanding bonds and notes and would prevent them from financing necessary capital improvements. They denied the charge that their operating costs are excessive because the only evidence in the case shows the costs per car-hour and per car-mile were lower than the average for twelve large companies.

The companies insisted that the commission has no authority to set aside the provisions of ordinances as to maintenance and renewal charges and that it would be a grave mistake to reduce these expenditures at a time when the property, built since 1907, is beginning to need more repair and replacement. Also they attacked the section of the order which would prevent further payments into the injuries and damage reserve fund, and they stated the commission has no power to deduct from operating expenses the cost of sweeping, sprinkling and cleaning streets.

The Chicago Surface Lines filed a petition in the United States District Court on April 18 for a permanent injunction against the 6-cent fare order. The plea was made on the ground that the proposed rate is confiscatory. Judge Page set a hearing for next Monday afternoon, at which time he will decide whether he will grant a temporary restraining order to serve until the court can hear the case completely.

Plans Made to Develop Waterway Traffic and Shipment by Electric Railway

The Louisville (Ky.) Railway and the Interstate Public Service Company, the latter operating the interurban lines north through Indiana from Louisville, are destined to play an important part in the revival of Ohio River transportation. President James P. Barnes, of the Louisville Railway, is chairman of the executive committee and director of the new Inland Waterways Company, and Harry Reid of the Interstate is a director. The new corporation is chartered with a capital of $1,000,000. Plans call for bringing freight to Louisville from upper river points as far off as Pittsburgh and reshipping or distributing from Louisville by steam and electric railway.

The drawback to river shipping in the past has been found in the fact that so many large plants are located inland. This means that to move the river shipments to these plants after the materials reach city destination resort must be made to very expensive drayage. However, if plans now being made are worked out to completion it is probable that the Louisville Railway will not only transfer freight from river barges and boats to freight cars for delivery to its interurban lines, but will also transfer to plants located on city car lines.

Through proper co-operation the interurbans will be able to secure materially increased tonnage and will be in position to aid the waterways companies in forcing the steam lines to play the game.

Service Restored in Augusta on April 15

Appeal for Relief from Unfair Jitney Competition Heeded, but Company Reserves Right to Withdraw Cars Again if Experiment at Regulation Fails

Electric railway service was resumed on April 15 in Augusta, Ga., by the Augusta Railway & Electric Corporation, after a suspension of just a month. The City Council and Charles S. Banghart, general manager of the company, came to terms on April 12 at a special meeting of the Council. The action under which the jitneys will now be regulated was concluded behind closed doors. The agreement was reached after less than an hour's deliberation.

UNDER the agreement Council will so regulate the jitneys that they shall not be permitted to take on or discharge passengers nearer than one block of the street car lines. It will also prevent the jitneys from crossing Broad Street except at the intersection of Broad and Fourth Streets and Broad and Fifteenth Streets. The railway agrees to a 7-cent token fare to be sold in multiples of five, will charge the casual riders 10 cents and sell school children and teachers tickets at 5 cents, as heretofore.

The agreement was reached when Mr. Banghart, representing the corporation, accepted the terms presented in a resolution coming from the finance and special traffic committee of Council. This resolution was amended at the session of Council on April 12 by a substitute presented by Councilman C. Vernon Eliott and was adopted.

The original resolution from the committee and the Eliott substitute follow:

ORIGINAL RESOLUTION

Whereas, in the opinion of the City Council of Augusta it is necessary to further regulate jitneys in the city of Augusta, as a traffic regulation in the exercise of the police power of said city; now, therefore, be it

Resolved, That the police committee of the City Council of Augusta be, and it is hereby authorized and directed to so regulate the jitneys now licensed by the City Council of Augusta as that they shall not be permitted to take on or discharge any passengers nearer than one block of any street car line of the Augusta-Aiken Railway & Electric Corporation, and further to so regulate said jitneys as to prevent their crossing Broad Street, except and alone at the intersection of Broad and Fourth Streets, Broad and Twelfth Streets and Broad and Fifteenth Streets.

(Amended)

SUBSTITUTE RESOLUTION

Whereas, in the opinion of the City Council of Augusta it is necessary to further regulate jitneys in the city of Augusta as a traffic regulation in the exercise of the police power of said city; now, therefore, be it

Resolved, That the police committee of the City Council of Augusta be, and it is hereby authorized and directed to so regulate the jitneys now licensed by the City Council of Augusta as that they shall not be permitted to take on or discharge any passengers nearer than one block of any street car line of the Augusta-Aiken Railway & Electric Corporation, and further to so regulate said jitneys as to prevent their crossing Broad Street, except and alone at the intersection of Broad and Fourth Streets and Broad and Fifteenth.

2. Resolved further, That in restarting its cars the status quo ante existing between the city and the Augusta-Aiken Railway & Electric Corporation, with respect to the rights, privileges, duties and obligations belonging to or imposed upon either the city or the company, shall be and remain the same as they were prior to March 15, 1922, provided nothing herein contained shall be construed as in any way enlarging the franchises granted to said railway company prior to March 14, 1922.

Adopted in open Council, this the 12th day of April, 1922.

In a letter to the Council dated April 12, Mr. Banghart agreed that if the Council passed the resolution presented to him the company "will assure the public that it will resume service in the city, charging 10 cents for the casual rider and will sell tokens at 7 cents in multiples of five, and sell school children and teachers tickets at 5 cents as heretofore."

Furthermore, the company agreed to resume and maintain not more than a fifteen-minute schedule or headway on all city lines. The company also agreed to maintain a seven-and-one-half-minute service on the Summerville line as far as Baker Avenue during the morning and afternoon rush hours.

Mr. Banghart indicated that the company was willing to try to operate under the conditions just outlined, but that it was obvious that it could do so successfully only with the full co-operation of the riding public. The company has pledged itself to do its best to make operation a success under the new conditions, but that it must remain free to exercise its legal rights and to stop cars again if after a reasonable trial the jitney competition as regulated under the new order still cuts into the railway company's legitimate revenue as reflected in the operating receipts and expenses.

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New Loop Plan Suggested

The Board of Control of Steubenville, Ohio, in co-operation with various committees of the City Council has submitted a new loop plan to the City Council for all rail traffic within the city. The new loop plan eliminates five "dead-end" terminals in the city business district, provides for continuous operation of cars on all lines with elimination of loss of time for passengers and congestion on busy thoroughfares, makes Market and Adams Streets "one-way" streets for electric lines and in the opinion of officials, as near as is humanly possible, remedies inconvenience to the traveling public and congested traffic. Under the new plan, which is said to meet with the approval of the operating companies, universal transfers on all lines will be issued.

City Fathers Allow One-Man Cars

One-man cars, of the Birney type, similar to those which have been so successful in Tampa, will be permitted on the lines of the Jacksonville (Fla.) Traction Company, following the decision of the city fathers there to accept the recommendations of the laws and rules committee of the Council. The decision amends Section 5 of the existing ordinance which says that there shall be a conductor and motorman on each car.

The Jacksonville Traction Company, a Stone & Webster subsidiary, and now in receivership, had requested the city to eliminate that section of the ordinance regulating electric railway traffic that requires that a car crew shall consist of a conductor and a motorman.

According to E. J. Triay, receiver for the Jacksonville Traction Company, the installing of one-man cars in Jacksonville will not mean that the number of carmen now employed by the traction company will be reduced. The men will merely be assigned to different cars, thereby increasing the car service.

Hopeful That Traffic Will Increase

The maximum decline in the number of passengers transported by the Cincinnati (Ohio) Traction Company has passed, according to William Jerome Kuertz, Director of Street Railways, who has just completed compilation of figures for the first three months of 1922. Director Kuertz said that while the number of passengers was less for the first three months this year as compared with last year, the bottom of the depression has been reached and the trend is upward.

In January this year there were 8,932,704 revenue passengers as compared with 9,093,024 in January, 1921. In February, 1922, there were 8,071,061 and in February, 1921, 8,208,261. March showed an increase to 9,098,342. In March, 1921, the number was 9,238,402. Director Kuertz said that the percentage of difference is being overcome from month to month and at the present rate the traction company will exceed last year's figures and will be on a fair way to equalizing the record of 1920.

Hearing on Lower Fare—Decision Reserved

James T. Manee was the only signer of the petition to the Public Utilities Commission for a reduction of fares at Hartford, Conn., to 5 cents who appeared at the hearing on April 18 in the Capitol in support of the petition. The Connecticut Company was represented by President Storrs and Attorney Joseph Berry. Commissioner Elwell conducted the hearing alone. The commission reserved its decision.

Mr. Manee declared the people of Hartford did not consider the three-tokens system a satisfactory substitute for a flat rate of 5 cents. He knew that the commission had given consideration to the 5-cent proposition and he did not come to the hearing with figures in support of the petition. He would not favor the petition if the granting of it would have a tendency to reduce the wages of the trolley company's employees. The people traveling on the cars felt that a 10-cent fare was burdensome.

President Storrs said that before the war the payrolls of the company amounted to $4,000,000 annually. At the present time the payrolls amount to $7,000,000. Coal and materials have doubled in price. A 5-cent fare was beyond a possibility. By the reduction of fares in Hartford 16 per cent the company contributed $50,000 in the month of March to the cost of living in Hartford. About 90 per cent of the people of Hartford took advantage of the reduction by buying tokens.

Emergency Ordinance Passed

The City Council of Akron, Ohio, on April 18 passed an emergency ordinance granting the Northern Ohio Traction & Light Company a 5-cent fare until the expiration of the present 4-cent fare franchise Feb. 1, 1924. The new franchise provides that the company must lay tracks on North Main Street over the North Hill Viaduct, on a portion of West Market Street, and install eight new buses as feeders to present traction lines. The ordinance provides the work must be completed with ninety days after the company is notified.

The company has been receiving a 5-cent fare under ordinances passed from time to time for the last year and a half. The passage of the present ordinance clears the situation for an agreement. It is expected that a permanent contract will be agreed upon during the next few months. While the franchise passed is subject to a referendum within the next sixty days, it does not appear at this time that a referendum will be called for the reason that the public attitude toward the company is such that a referendum would merely ratify the action of the Council.

New Service to Start

Arrangements have been completed for a two-hour through limited interurban service between Akron and Warren, Ohio, to begin May 1 over the Northern Ohio Traction & Light Company and the Cleveland, Alliance & Mahoning Valley Railway lines with connections at Ravenna for Alliance. Tickets will be sold through from Akron to Youngstown, using the Pennsylvania-Ohio Electric line beyond Warren, where transfer will be necessary for the present.

The first train leaves Akron Terminal, eastbound, at 6:50 a.m. and every two hours until 4:50 p.m. The first train leaves Warren, westbound, at 6:45 a.m. and every two hours until 4:45 p.m. The schedule running time is one hour and fifty minutes each way. New steel cars will be used.

Trains will stop at Chalkers Landing, Cuyahoga Falls, Silver Lake, Kent, Brady Lake, Ravenna, Wayland, Newton Falls, and Leavittsburg. Eastbound trains stop only at Wayland and Leavittsburg to discharge passengers, while westbound trains stop at these two points only to pick up passengers.

Will Report Traffic Violations

A number of traffic changes are in the making at the present time in Louisville, Ky. One act which will probably be passed will prohibit autos passing street cars on the left side when both auto and vehicle are moving in the same direction. Just recently there was a bad smash when an auto was caught between two cars moving in opposite directions and three people have been in the hospitals for some time as a result. An ordinance prohibiting parking for more than fifteen minutes in the downtown district is now before the board.

Through the efforts of the Louisville Safety Council and the Automobile Club several hundred prominent men, including many motorists, have been appointed members of the Citizens' Police Auxiliary Committee, these members reporting all traffic violations which they see, especially cases where automobile owners pass standing street cars. Members of the auxiliary committee have received fresh identification cards.

Hearings Started.—High percentages of overloading during the rush hours on the Myrtle and Marcy Avenues stations and on the Canarsie line were disclosed on April 17 when the Transit Commission began its investigation of service on the subway and elevated lines of the Brooklyn Rapid Transit Company. Statistics were presented by W. K. Edgerton, the commission's assistant supervising inspector. Clarence J. Shearn, chief counsel to the commission, said that conditions would be different if the city had put the Fourteenth Street Eastern District subway in operation. The investigation was adjourned until April 24.

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"Weekly Pass" in Meadville, Pa.

You can now ride whenever you like and as often as you like in Meadville, Pa., for $1 a week. The new arrangement, which is the "weekly pass" plan, is the result of a conference between a committee appointed by the Chamber of Commerce and Charles M. Hatch, vice-president and general manager of the Crawford County Railways, operated under lease by the Northwestern Pennsylvania Railway. Mr. Hatch recently wrote to the Chamber of Commerce stating that owing to the decrease in riding the company was considering some way of readjusting the rates or increasing the traffic in the city. A committee was then appointed and at a conference held on March 30 it was brought out that the business of the company had decreased 20 per cent below the same months of 1921 and that the company proposed to put on sale a reduced ticket rate.

The 10-cent cash fare or ticket plan will still be in effect. It is said that the tickets are transferable but are not good on interurban cars. This "weekly pass" plan is the same as in effect in Youngstown, Fort Wayne and other cities of moderate size.

Extension of Freight Service Announced

A new avenue for the shipment of freight to and from Cleveland, Akron, Massillon, Canton and other points has been opened by the Northern Ohio Traction & Light Company, Akron, Ohio Through the establishment of this service there will be an early morning distribution of freight from Cleveland to all points on the Northern Ohio Traction & Light, Mahoning Valley, Pennsylvania-Ohio Electric, Stark Electric and other roads with which negotiations are now in progress. Arrangements have also been practically completed for the handling of freight from every point on the Northern Ohio Traction & Light to other cities and states via several steam lines. Rates will be the same as on steam roads.

A freight house has been established at 725 Eagle avenue, near Ninth street and Euclid Avenue, which is in the center of the city's business district. Northern Ohio Traction & Light cars will be switched to this freight house and loaded. The extension of freight service has necessitated the establishment of new freight depots, outside of Cleveland, in Ravenna, Barberton, Massillon, Dover and New Philadelphia.

Petition for Lower Rates

J. P. Jones has filed a petition with the Georgia Railroad Commission asking for a reduction of the fares to 5 cents on the Rome Railway & Light Company's lines. Various charges are made against the railway in the petition, which states that after the reductions are sought in railway fares and in light and power rates it would still be possible for the company to earn fair returns on the capital invested. The petition was filed in Atlanta and May 26 has been set for the hearing by the commission.

Transportation News Notes

Will Determine Fares.—The City Commission of Fort Smith, Ark., has promised a thorough investigation of the earnings of the Fort Smith Light & Traction Company for the purpose of determining whether the company is to return to a 5-cent fare.

New Plan to Become Effective.—The skip-stop system will shortly be started on electric railway lines in Oklahoma City, Okla. Announcement to this effect was recently made by J. W. Shartel, vice-president of the Oklahoma Railway. The skip-stop plan is already in use on one of the Oklahoma City lines.

Will Appeal Rate Decision.—The Nashville Interurban Railway, operating between Nashville and Franklin, Tenn., has announced through its officials its intention of appealing the decision of the Public Utilities Commission in regard to its rates. The order of the commission reduced the passenger rate from 10 cents to 4 cents.

Five-Cent Fare Orders Issued.—Officials of the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, recently announced the return of the 5-cent fare on local lines. The lower rate instead of the three-fare zone system is the result of a decision of the Federal District Court.

Merchants Oppose Rates.—Merchants of Wheeling, W. Va., working with a committee of the Chamber of Commerce, are planning to take action soon to force a reduction in rates of the Wheeling Traction Company and the Wheeling Public Service Company. Retail merchants claim that the alleged high rates keep out business from the Ohio district.

Interurban Adopts Daylight Saving.—Despite the fact that the city of Springfield, Ohio, rejected a proposal to establish daylight saving in the city at a referendum, last fall, the Indiana, Columbus & Eastern Traction Company will operate trains on the advanced time effective April 30 to Oct. 1. Springfield is one of the few cities on the traction line that does not operate on advanced time during the summer months. Moreover, connecting lines operate on Daylight Saving time during the summer.

Use of One-Man Cars Being Extended.—One-man cars have been introduced by the International Railway, Buffalo, N. Y., on several local lines in the city of Niagara Falls and there has been an extension of the one-man car service in Buffalo. The company has been operating one-man cars in Lockport for several years. In Niagara Falls, where the company had been operating cars on certain lines on a forty-minute schedule, one-man cars are being operated under a twenty-minute headway.

New Rules for Car Operation.—Under a new ordinance adopted by the City Commission of Trenton, N. J., electric railway companies operating within a radius of three-quarters of a mile from the center of the city of Trenton are prohibited from allowing cars to stand for a longer period of time than is reasonably necessary for receiving and discharging passengers. Trolley companies are also prohibited from allowing two cars to stand side by side at any terminus for any period of time whatsoever.

Zone Ticket Machine to Be Installed.—Shanklin Equipment Company, Springfield, Mass., has contracted with London Tramways, Ltd., to supply a machine for issuing zone tickets and adding fares automatically, and the first lot of machines was shipped to England, April 14. The use of the machine is said to be an experiment and the outcome will have a bearing in determining if it is feasible to install one-man tram cars to replace the buses so extensively in use in that city. Alfred L. Chase, chief of the Shanklin Company's mechanical organization, is going to London to install the machines.

Contract with Public Trustees Must Stand.—Attorney-General J. Weston Allen of Massachusetts has rendered an opinion in which he declares unconstitutional some fourteen bills submitted to the Legislature by residents of Boston having for their object the restoration of the 5-cent fare on all lines of the Boston Elevated Railway and the Eastern Massachusetts Street Railway. According to Mr. Allen the contracts must stand which were made in 1918 providing for the operation of these roads under a board of public trustees. The bills were introduced as a result of the pre-election promises of Mayor Curley.

City Will Take No Action.—Announcement has been made that no action will be taken by the city of Erie, Pa., in the matter of the recent ruling of the Public Service Commission in refusing to make mandatory recommendations for a reduction in fares in the city until official notice of the ruling has been received by the city. The Public Service Commission over a year ago recommended that fares on the Buffalo & Lake Erie Traction Company be reduced in the city. Such recommendations have been ignored by the company and the council petitioned the commission to make the recommendations mandatory. The Public Service Commission has declined to do this, on the ground that the operating expenses of the company are such as not to permit a reduction in fares.

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Personal Mention

Oscar Terry Crosby

Germans Listen Attentively to Outspoken American Who Advises Them to Clean House Financially

Oscar Terry Crosby, publicist, economist, explorer, engineer and electric railway executive, has been indulging in his favorite pastime again. He has been on another investigation. Mr. Crosby is always investigating somebody or something. The difference between Mr. Crosby and your ordinary investigator is that when Mr. Crosby investigates anything he goes to the bottom of it, with permanence in view as the outcome of such recommendations as he may make.

Just now Mr. Crosby happens to be in Germany, but he would be equally at home most anywhere else in the wide world. According to newspaper accounts, the former Assistant Secretary of the United States Treasury—for this is one of the many posts Mr. Crosby has held—has startled the German optimists by the candid manner in which he set forth the conditions which any conservative leader would obviously impose before diverting his capital to the field of government or large private loans in Germany. But that isn't all. Among other things he has proposed to the Germans a determination of the theoretical value of the paper mark, based on the average index figures and exchange rates during the era of inflation.

The Germans are not the only ones Mr. Crosby has shocked. He does not think that others have been very much nearer to being correct or less free from economic sins than have the Germans. He is of the opinion that the Reparations Commission has been negligent in making demands without requiring the one step which would permanently put its debtor in a position to make orderly payments in the future. This step, he explains, is the establishment of sound currency. His plan is one of the fruits of his direct study on the ground, but has its real basis on knowledge gained previously.

It will probably be recalled that Mr. Crosby was formerly resident manager in Belgium of the work of the American Commission for Relief in Belgium and Northern France and that late in December, 1917, he represented the United States at a meeting of representatives of all the Allies held in London to discuss the industrial and economic situations. And thus it goes.

Money has been a means to the end with Oscar Crosby, never the end. Long before Edward Bok and others began to preach the doctrine of letting younger men take over the active reigns of business, Mr. Crosby had put aside all thought of active participation in business affairs in order that he might devote himself to his avocations and to the public service. The safe guess would be that Mr. Crosby has worked harder since 1914, when he entered the public service, than he ever did before. That, indeed, is saying a great deal when proper weight is given to the many business interests of the man in the pioneer days of the electric railway industry. Mr. Crosby is in many respects a marvel. That sounds big and imposing. Well, it is meant to sound that way. And what is more, it is a fact.

Enter Safety Director Koehler

A. W. Koehler has been appointed director of safety of the New York State Railways. He is a newcomer in the electric railway field, but he has had an extended and successful experience in safety work. For two years previous to joining the staff of the State Railways Mr. Koehler was executive secretary of the Rochester Safety Council, which is affiliated with the National Safety Council. During the previous five years, with the exception of a period of war service in the engineering department of the Navy, he was engaged in safety work with the Commonwealth Steel Company, Granite City, Ill., and the Atlantic Steel Company, Atlanta, Ga.

A. W. KOEHLER

Mr. Koehler graduated in mechanical engineering from Purdue University in 1915. His experience since graduation has convinced him that the field of industrial accident reduction is a promising one for young engineers. He visualizes a great opportunity on the New York State Railways, in spite of the fact that that company has been one of the pioneers in this field.

P. L. Hatch is now general manager of the Glendale & Montrose Railway, Glendale, Cal. He was formerly superintendent and purchasing agent.

F. W. Gerlach has been appointed general agent of the newly created freight department of the Northern Ohio Traction & Light Company, with headquarters in Cleveland. C. J. Laney, traffic manager, will have complete supervision over the new department.

Harry Reid, president of the Interstate Public Service Company, which owns and operates the Indianapolis, Columbus & Southern Indiana Traction Company and other public utilities in Indiana, has been elected president and also a member of the executive committee of the Great Lakes division of the National Electric Association. The Great Lakes division is made up of Illinois, Wisconsin, Michigan and Indiana. The division will hold its annual convention at French Lick in September.

C. D. Cass, general manager of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, some weeks ago addressed the annual convention of the Iowa Engineering Society at Sioux City on the steam railway situation. Mr. Cass was one of the managers under federal operation during the war and knows the difficulty now faced by the railroads. He said the roads are so hedged about by restrictive regulations and regulatory bodies that they do not and cannot respond promptly enough to economic changes and conditions. He pointed out that the railroads are subject to a host of masters—the United States Congress, the Interstate Commerce Commission, forty-eight state legislatures, forty-eight state railroad commissions, hundreds of county governments, thousands of city governments, untold numbers of health officers, township trustees, highway commissions, road supervisors, and what not—because each of these governmental agencies has the absolute power to compel a railroad to make expenditure of money under authority of law. The address was well received.

Obituary

William J. Armstrong, assistant treasurer of the Gould Coupler Company, New York, died suddenly at his home in Brooklyn some time ago. Mr. Armstrong had been connected with the company for the past twenty-five years.

John H. Campbell, treasurer of the Interborough Rapid Transit Company, the Interborough Consolidated Corporation and the New York Railways, New York, N. Y., died April 5 at Garden City, Long Island. Mr. Campbell gained political importance during the régime of Richard Croker, and served as his private secretary when Mr. Croker was Tammany leader. For some years before he became secretary of the traction companies, Mr. Campbell was deputy city chamberlain, leaving that work in 1908 to take up his duties with the Interborough.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Railway Business Is Increasing

We find it necessary this week to devote more space than usual to information on business and market conditions. Reports of track reconstruction and extension have been increasing daily and purchases for power and rolling stock equipment indicate a steady increase. Reports from the Department of Commerce on foreign conditions show an increased demand for American products, and in other closely allied lines there is indication of a continued though slow resumption of business.

Some Figures on Coal Production

Complete returns of coal loaded into cars at the mines indicate that production during the first week of the strike was 3,784,000 net tons of bituminous coal and a few cars of anthracite dredged from the rivers. The total production of all coal was 3,793,000 net tons. In the first week of the great strike of 1919 only 3,582,000 tons of bituminous coal were produced, but at that time the anthracite mines were working to capacity and produced 2,008,000 tons. The total production of all coal in the first week of the 1919 strike was therefore 5,590,000 tons. Preliminary telegraphic returns for the present week indicate no change in anthracite, but a slight decrease in the output of bituminous coal.

The current production is less than the districts now at work are able to produce when the demand for coal is active. It is true that a number of important non-union mines in the Connellsville coke region and in central Pennsylvania have been closed by the strike, but the existing demand is not sufficient to call out full production in those districts remaining at work. From mines in many non-union fields reports of "no market," "dull demand" and "unbilled coal" continue to be received. The number of loaded cars unconsigned at the mines was very large when the strike began, but the latest reports from the railroads show that it is increasing rather than decreasing.

New Director of Industrial Relations for Schenectady Plant

G. H. Pfeif, has been appointed director of industrial relations at the Schenectady plant of the General Electric Company, succeeding E. B. Merriam, who recently became executive engineer of the Switchboard Department. As director of industrial relations he will have supervision over the employment, education and training, compensation, hospital and safety work of the Schnectady plant.

Mr. Pfeif has been with the General Electric Company since 1905 and for the past several years, as secretary of the committee on student affairs, has been in charge of the selection and placement of technical graduates in the student engineering courses of the Company.

Railway Electrification in Switzerland

The general management of the Swiss Federal Railways has requested the Administrative Council to approve of the plan for electrification of the Lucerne-Olten-Bale line (92 km.) and to provide it with a credit of 28,300,000 francs to purchase the necessary installations, materials and tools. The management also requests that it be permitted to alter the present construction plans at its own discretion whenever the present credits might be greatly surpassed.

German Rails and Steel Poles for Edinburgh

The Edinburgh Tramways Committee, by a majority, has recommended the acceptance of the quotation of a German manufacturer in Cologne for 130 tons of tramway rails and 5 tons of fish-plates. The German firm quoted, through its British agent, £1,365, and the nearest British offer was £1,495. The German figure, on a basis of $4.40 to the pound sterling, would be equivalent to $33.37 a ton.

The Edinburgh committee also unanimously agreed to accept the tender of another German firm for steel poles. The British quotation was £7,977, as against £5,436 by a Düsseldorf firm.

More Electric Railway Extensions Planned for London

Late developments of the project for certain extensions and improvements of the London Underground Railways show that the trade facilities committee of the government has reported favorably on the plans which have been proposed and has recommended that the government guarantee the principal and interest upon a sum not exceeding £5,000,000 for this work. Press comments state that there is every reason to believe that the recommendation of this committee will be accepted and that the guarantee will be given. A survey of the situation is being made for the U. S. Department of Commerce by a representative at London of the Bureau of Foreign and Domestic Commerce, and further details relative to the commencement of this work are expected soon.

Western Electric Reports Earnings of $10,166,337

The net earnings of the Western Electric Company in 1921 were $10,166,337, compared with $8,277,414 in 1920. This increase in the face of a drop in gross sales from $206,112,000 in 1920 to $189,765,000 is attributed to a thorough readjustment and reduction of expenses. The balance carried to the common stock after payment of interest and dividends was $823,997. The unfilled orders of the company at Dec. 31, 1921, aggregated $75,525,000, as compared with $82,655,000 at the end of the year 1920 and $47,442,000 at the end of the year 1919.

C. G. Du Bois, president, says:

A survey of the prospects for 1922 indicates that the business in the company's products will be about the same in quantity as 1921, but somewhat less in money value, due to the lower price level at which the product will be sold.

Rapid Transit Proposals Made in Los Angeles

The Pacific Electric Railway, Los Angeles, Cal., has just made application to the City Council for a franchise to operate trains through a tunnel which it is proposed to bore between Hill Street Station and Glendale Boulevard. According to reports, work on the project can be started immediately after the granting of a franchise. It is expected that two years would be necessary to complete the work.

The proposed tunnel will cost approximately $1,850,000 and will be approximately 1 mile in length. Such a tunnel will remove a car a minute from the North Hill Street line, where conditions are very congested. At the same time the scheduled speed could be increased considerably and at least fifty grade crossings would be removed.

Railway Electrification in Java

The estimates made in the Netherlands Indian budget for the electrification of the railways of Java have been accepted, but no time has been set for the beginning of the work. A German concern has recently sent a special representative to Java for the purpose of studying the plans and making competitive bids on machinery and the necessary supplies.

Metal, Coal and Material Prices

Metals—New York	April 18, 1922
Copper, electrolytic, cents per lb.	12.875
Copper wire base, cents per lb.	14.125
Lead, cents per lb.	5.125
Zinc, cents per lb.	5.25
Tin, Straits, cents per lb.	31.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.75
Somerset mine run, Boston, net tons	2.25
Pittsburgh, mine run, Pittsburgh, net tons	....
Franklin, Ill., screenings, Chicago, net tons	2.75
Central, Ill., screenings, Chicago, net tons	....
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.90
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	88.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	86.00

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Rolling Stock

West Penn Traction & Water Power Company, Pittsburgh, Pa., during 1921 added nine cars of double-truck type to the Coke Region Division rolling stock and ten cars of the double end double-truck type to the McKeesport Division.

Western Ohio Railway, Lima, Ohio, has purchased ten new passenger cars lighter than cars now used. The new equipment will cost $250,000. General Manager Carpenter stated that later on, to meet competition of the motor bus, the Western Ohio will place in service passenger buses on the highways.

Pittsburg County Railway, McAlester, Okla., which owns and operates the electric railway lines in McAlester and also the electric railway from McAlester to nearby towns, has purchased and put in operation a new type of electric locomotive, built especially for its line at a cost of $25,000.

Chicago, North Shore & Milwaukee Railroad has requested bids on twelve new single-truck safety cars, ten merchandise dispatch cars and ten steel passenger coaches, all of which will be motor cars. There is a possibility that a larger number of cars may be ordered and that the specifications as to types of cars to be purchased may be changed. Types of equipment, and passenger car design, are under study and investigation at the present time.

Power Houses, Shops and Buildings

Toledo & Indiana Railroad, Toledo, Ohio, has purchased a site at Washington and Ontario Streets, Toledo, and will soon build there an interurban freight station. President L. P. Schenck has announced that the move was made necessary because of the indefiniteness of the present leases for the interurban union freight station in the downtown district. The Ohio Electric will use its own interurban station. Two or three other lines are negotiating for the right to use the Toledo, Bowling Green & Southern freight station, and some lines may also want to enter the Toledo & Indiana station for their freight business.

Holyoke (Mass.) Street Railway may have a joint waiting station with the Boston & Maine Railroad. At a hearing before the Holyoke Board of Public Works on March 11 on a petition to abolish the Boston & Maine passenger and freight stations at Smith's Ferry, the feasibility of this plan was considered. A plan to establish physical connection between the tracks of the two companies at this point is also under discussion. This would enable cars to be run from a nearby quarry onto the Boston & Maine without transferring the loads. Several plans to reduce the dangers arising from the grade crossing were considered.

Brooklyn, N. Y.—The $342,000 bid of F. L. Cranford for the construction of the Lawrence Street subway station on the Whitehall Street line of the Brooklyn Rapid Transit Company was found to be the lowest when the bids were opened before Leroy T. Harkness, a member of the Transit Commission. The terms of the contract provide that the station must be ready for operation in eighteen months from the time work is begun and must be entirely completed in twenty-four months. Work is to begin within thirty days of the date of the delivery of the contract. The bid next lowest was that of the Joslin Construction Company, $355,000. The highest was that of Pat McGovern, $502,000. There is already a platform at Lawrence Street, but it has never been used.

Track and Roadway

Montreal, Que.—At a recent meeting of representatives of the City Council and the Tramways Commission it was definitely decided to build a car line to the top of Mount Royal.

San Francisco - Oakland Terminal Railways, Oakland, Cal., has protested the extension of its Rockridge line on the ground that this improvement would necessitate a new switch at a cost of $5,000.

The Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., is planning a program of improvement work on its lines in the city. Double tracks will be laid on some streets.

Georgia Railway & Power Company, Atlanta, Ga., will spend $220,000 on improvement work. On Marietta Street 122-lb. rail will be put in and 103-lb. rail on Decatur Street. These rails will be laid in a concrete roadbed.

Cincinnati (Ohio) Traction Company will start the work of putting in new rails on Hamilton and Eastern Avenues on May 1. These thoroughfares are equipped with double tracks and the new rails will be laid for a distance of 1 mile on each street.

Eastern Pennsylvania Railways, Pottsville, Pa., replaced much new track during 1921 and built a new siding at Port Carbon. Some of the overhead trolley wire was also replaced. During the year $399,719 was expended for improvements and extensions to the property.

Winona Interurban Railway, Warsaw, Ind., operating from Goshen, Ind., to Peru via Warsaw, is building a track connection with the Michigan division of the Big Four railroad at New Paris, 6 miles south of Goshen. The arrangement will also afford connection with the Wabash Railroad at that place.

Steubenville, Ohio.—Plans for a loop system for all traction lines in Steubenville have been mapped out by the city board of control and safety and street committees of Council. The idea is to route all city lines on a loop embracing Sixth, Adams, Third and Market Streets.

Inter-City Terminal Railway Company, North Little Rock, Ark., will formulate plans for laying tracks on the new Main Street bridge, which is being constructed to facilitate traffic between Little Rock and North Little Rock. The proposed improvements will cost about $150,000.

New York, N. Y.—The Transit Commission is planning to build a subway from Long Island City to Borough Hall and to extend the Fourth Avenue subway to Staten Island. George McAneny, chairman of the commission, recently made this announcement before the Brooklyn Chamber of Commerce.

Shenango Valley Traction Company, Youngstown, Ohio, will begin work on the double tracking of its line on Broadway, Farrell and South Dock Streets, Sharon. Where necessary, the present double-track section will be rebuilt so that there will be a continous double-track system. The rail used will be grooved girder. It will be laid on International twin steel ties.

Public Service Railway, Newark, N. J., is preparing plans for extending its lines to the proposed bridge plaza at Camden, where a structure will be erected across the Delaware River. The railway is waiting to hear from the bridge engineers before deciding on a loop or otherwise at the bridge approach.

Little Rock Railway & Electric Company, Little Rock, Ark., may be required to place its wires underground at the foot of Broadway Street, so that the work of constructing the new bridge across the river at this point may not be interfered with, according to a recent City Council resolution. The work will cost about $7,000.

Altoona & Logan Valley Electric Railway, Altoona, Pa., will soon start work on double-tracking the Eighteenth Street line between Eleventh Avenue and a point between the culvert and Nineteenth Street. The officials have under consideration the matter of extending the Fairview line beyond Fourth Street on Twenty-Second Avenue.

Savannah Electric & Power Company, Savannah, Ga., has started the work of repaving West Broad Street. The track improvements recently referred to in the ELECTRIC RAILWAY JOURNAL include heavier rail on the Thunderbolt line from Nelson's switch to the Casino, heavier rail on Forty-sixth Street and increased capacity of the Daffin Park line.

Interstate Public Service Company, Indianapolis, Ind., is working out plans for an extension of the electric transmission line from Salem to Campbellsburg, 12 miles west. A small plant is in operation in Campbellsburg at the present time, affording only fourteen-hour service, and business men are making every effort to obtain twenty-four hour service.

Marshall (Tex.) Traction Company may extend its line to serve a new industrial district established near that

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city and schools. The city wants the line extended west to the Darco plant, then south around Wiley University, east to the Southside High School then north to join with the present terminus of the line on Fannin Street. The extension will make a belt around the city south of the Texas & Pacific Railway and will be more than a mile in length.

Portland Railway, Light & Power Company, Portland, Ore., will make extensive repairs to its tracks in various parts of the city during the coming summer. Definite plans have not been made but the tracks on Hawthorne Avenue will probably be reconstructed from East Water to East Twelfth Streets. In addition to its repair and reconstruction program, the railway company must participate in the costs of the improvement of Foster Road, East Twenty-eighth and Sixty-second Avenue Southeast.

Houston, Tex., John Henry Kirby of Houston, Tex., and other financiers are promoting a proposition to build an interurban line from Houston to Seabrook and other resort towns on the coast near Houston. The matter has been placed before Mayor Holcombe and the City Commissioners of Houston and application has been made for a franchise over the streets of the city of Houston. The proposed line will be about 25 miles in length and will reach all the resort places along the shores of Trinity Bay between Houston and the gulf.

Indiana Service Corporation, Fort Wayne, Ind., will co-operate with the Wabash, Ind., officials in repairing that portion of their car lines on the streets of Wabash. This includes the city car line and the interurban lines on West Market Street. General Manager Greenland was in Wabash recently to inspect with City Engineer Latchem the condition of the car lines. Mr. Greenland stated that the company would give its co-operation and send an engineer soon to make tentative plans for improvements needed.

Des Moines (Iowa) City Railway will make track extensions and improvements on two more lines this spring, according to F. C. Chambers, manager. On the Clark Street line a double track is to be put in from the point where the north line of Keosauqua Way intersects Twelfth Street, run north to School and west to Thirteenth Street. On the same line passing tracks are to be put in from Twenty-ninth Street to Thirty-second Street on Clark. This will make a total of six blocks of new track improvements on Clark. Passing tracks which now extend from Guthrie to Arthur Avenues on the East Sixth and Ninth line will be extended on two blocks further to Morton Avenue.

Springfield (Mass.) Street Railway through President Clark V. Wood reports an agreement with the Hampden County (Mass.) commissioners to pay an annual rental fee of $10,125 for the privilege of laying its tracks across the new Connecticut River bridge. A hearing has already been given by the City Council of Springfield on the company's petition for location of tracks approaching the new bridge. The company was very desirous of establishing a physical connection between its west and east side lines, so as to admit of running cars across the bridge and thence to principal urban and interurban routes, as deemed advisable, and it is said that this condition has been fulfilled. Cars, by this plan, would be looped around Court Square Extension by way of Water Street. The cost of building the approaches to the bridge is estimated by the company at $300,000.

Recent Incorporations

Lafayette (Ind.) Street Railway has filed articles of incorporation with Ed Jackson, Secretary of State for Indiana. The concern has taken over the local lines at Lafayette after sale under foreclosure.

South Florida Traction Company, Miami, Fla., has been incorporated. The officers are G. E. Merrick, president; F. King, vice-president, and I. M. Carr, secretary-treasurer. The line will operate south of Miami as far as Cocoanut Grove and will include Homestead and West Palm Beach.

Professional Notes

Edwin F. Wendt, consulting engineer is now established in the practice of engineering in connection with valuation, financing, consolidation, etc. His office is in the Union Trust Building, 740 Fifteenth Street, N. W., Washington, D. C.

Waddell & Son, Inc., New York City, consulting engineers for the Connecticut State Highway Commission on the Washington Bridge over the Housatonic River, designed the special track and overhead construction on the bascule span described in the issue of April 8. The article simply says "that the bridge was built under the direction of engineers of the State of Connecticut."

Trade Notes

The Economy Electric Devices Company, Chicago, has recently received orders from the Wheeling Traction Company for fifteen watt-hour meters; from the Poughkeepsie & Wappinger Falls Railway, for twenty-one meters; the Southern New York Power & Railway Corporation for eleven meters, and from the Haagsche Tramweg Maatschappy, Holland, for twenty 1,200-volt watt-hour meters.

The United Alloy Steel Corporation, Canton, Ohio, announces that John McConnell has again affiliated himself with the company in the capacity of vice-president, in charge of operation. Mr. McConnell gained a reputation in the early days with the United Steel Company in producing the first vanadium steel in commercial quantities made in America. His experience comprises ten years with the Carnegie Steel Company, three years with the Bethlehem Steel Company, eleven years with the United Steel Company (now the United Alloy Steel Corporation), one year with the Central Steel Company, as consulting metallurgist, and three years as vice-president, in charge of alloy steel production, with the Interstate Iron & Steel Company.

J. R. L. Glover, who has been connected with the Bridgeport Brass Company for the past six years, has been appointed sales engineer on brass and copper pipe and piping. He has first-hand knowledge of the processes involved in the making of sheet, tube, pipe and rod. He resigned his position with the Bridgeport Brass Company to enter the U. S. Air Service in France. After his return from the war he was given a position in the sales department of the company. He was soon given the title phono-electric engineer, a position which he created due to his effective promotion of the sale of phono-electric trolley wire, one of the best known products of the Bridgeport Brass Company, which is used extensively for trolley construction at points of dense traffic or severe wear. This position Mr. Glover held up to the time of his present advancement.

New Advertising Literature

The Federal Porcelain Company, Carey, Ohio, has recently issued its new Catalog No. 2, covering its line of standard electrical porcelains.

Dwight P. Robinson & Company, Inc., New York, N. Y., has begun the publication of a house organ entitled the *News*. Vol. 1, No. 1 is dated March, 1922, and gives several items relating to the work being done by this company in various parts of the world.

The Griscom-Russell Company, New York, N. Y., has just issued a new bulletin, No. 360, in reference to the application of evaporators for the purification of boiler feed water by distillation. The booklet describes the use of Reilly evaporators in the power plant for the elimination of scale, blow down, priming, etc.

The Galena Signal Oil Company, Franklin, Pa., has issued a booklet giving an alphabetical list of equipment parts for rolling stock, power plants, shops, etc., together with the particular lubricant recommended for each part. This gives in compact form the company's complete line of oils and greases for shop machinery and other railway equipment and will be of service as a convenient guide to the selection of the particular oil or grease that the experience of the company has proved the best and most economical for the purpose.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors

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H. S. KNOWLTON, New England Editor
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ALEXANDER McCALLUM, British News Representative
ROBERT M. HAIG, Special Consulting Editor

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Supreme Court Decides Galveston Rate Case

THE decision of the United States Supreme Court in the Galveston case, rendered April 10, differs in a number of important respects from those in other rate cases. The city was willing to permit an 8 per cent return and the experts on both sides were agreed as to the cost of reproduction of the property on a historical basis and the amount of gross revenue and operating expenses. The main differences between the city and the company arose over various items in development cost, allowances for depreciation, maintenance and taxes, and the future trend of prices. The last-named question entered because the city maintained that prices were coming down and the company would soon be able to earn its 8 per cent, if it was not yet doing so, while the company wanted something more tangible than long-deferred hopes. In upholding the decision of the lower court, the Supreme Court declared it believed the city would probably "give full and fair consideration to a proposed change in rate if application were now made to it." If not, the court intimated that it was prepared to extend relief.

Some of the conclusions reached in its decision by the Supreme Court relating to going value are particularly interesting, especially those relating to the extent to which past losses and brokerage fees should be included in valuation. The consideration of the extent to which taxes may be deducted from income to determine what is a fair return will also attract attention.

Next Thursday Is Electric Railway Day

LAST year a number of electric railway companies celebrated May 4, the thirty-third anniversary of the completion in 1888 of the Richmond electric road, the first large electric railway in the world. At least five companies succeeded in resurrecting old horse cars, which were drawn about the streets of their respective cities to show what progress had been made in street railway transportation during the previous three decades. In three of these cases the car was driven by one of the horse-car drivers of the early days who was still connected with the company. The report of these celebrations in the issue of this paper for May 21, 1921, showed that they were witnessed by large crowds of interested people. Many of these had probably never seen a horse car before, and the comparison between this primitive conveyance and the comfortable and commodious electric car of modern type which accompanied it in several of the processions must have been impressive.

Certain other electric railway companies in the celebrations last year offered prizes for the best essays or historical reviews of the development of the local system. In one city the prize was limited to school children. Many electric railway companies referred to the anniversary in their advertisements in the daily papers. Most of the larger newspapers carried articles and editorials about the improvements in city transportation which had been effected during the past three decades.

Occasions and events of this kind are undoubtedly helpful to electric railway companies. Too many people take things for granted. They see electric cars running through the streets, but do not realize the long and expensive experiments which led up to the use of the present style of car. Still fewer probably understand that the cost of all of these expensive changes had to be defrayed by the electric railway companies.

For this reason an object lesson of the new and the old in transit is a good thing, and where the actual cars typical of the development are shown, it is more impressive than if the idea has to be conveyed by a printed statement. "Electric Railway Day" can well be celebrated each year, not necessarily in the same way, but in some way, for the benefit of the lesson that it carries.

Cross-Trench Nuisance Can Be Controlled

THE best possible foundation for a structure such as an electric railway track is solidly packed natural soil. Time is an important factor in the compacting process, and every disturbance interferes with the solidity of the soil. An electric railway which has a franchise for a track, even if it does not own the strip on which the track is built, should therefore have something to say regarding excavations through the franchise width of street area. Only thus can proper back-filling and pavement maintenance be assured.

Just how the electric railway's rights in this direction shall be safeguarded is a problem for local solution in each case. But the fundamental principle should be recognized that once the soil under a piece of track has been disturbed the track has a very uncertain support over the disturbed area until the soil is brought back to its original condition. Unless this is done the track must bridge the gap from solid soil to solid soil, with consequent effect on track and pavement. Photographs are reproduced elsewhere in this issue to illustrate the situation which actually develops, and an explanation is given of the way in which the results of these excavations are controlled in Montreal.

In the article referred to, the author outlines in humorous fashion the operations in an attack upon the integrity of a track foundation. The story which he tells will recall to the minds of the readers many experiences of the same nature if not of the same degree. The story enforces the logic of the whole matter, showing how ridiculous it is for a community to expect a railway to keep in condition its track, and oftentimes the inclosed and adjacent paving, and for the community at the same time not to furnish protection against damage to the track foundation. Followed as it is by an account of actual success in securing such protection, the story will do more than cause a smile.

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Another Term Needed in Valuation Nomenclature

LAST week mention was made in these columns of an interesting byproduct of recent hearings before the New York Transit Commission, namely, the enrichment of the electric railway vocabulary by the term "rotating standee." The same series of hearings has also disclosed the need for a further addition to the terms used in railway valuation procedure, or at least this need has become apparent through conclusions which have been drawn in public print from some of the testimony presented to the commission by members of its own staff.

It will be remembered that in the act creating the present commission it was instructed to make a valuation of the property, other than franchise or going value, necessarily used in railway service in New York City. Wisely the commission concluded as a preliminary to make estimates on several bases, of which four have been concluded. These were reported in the issue of this paper of Feb. 25, page 333.

The Valuation Bureau of the commission recommended one of these as the correct measure of present fair value and termed this one the "actual or estimated original cost less an amount necessary to restore the property to first-class operating condition." We pointed out then, however, that as defined in the accompanying report this term was a misnomer and it would probably be misinterpreted by the public to mean legitimate investment rather than what the figures actually represent. That this is so is increasingly evident. In valuation nomenclature legitimate investment has supposedly been indicated by "historical cost," a term quite generally used. Briefly, the "historical cost" is the aggregate of the sums actually and legitimately expended in producing the property, and if applied to the physical property it includes the cost of all experimental work necessarily conducted to determine the system finally to be used, the reconstruction costs to produce more modern plant, etc.

The "original cost" valuation of the New York Transit Commission does not aim to give this figure, at least for the street surface lines and for the original elevated railway line. Instead, it represents the expenditure which would be required to reproduce the property in its physical condition as of the date of inventory, but with the cost for the several classes of work and material taken not at the prices of today but at those prevalent in the year corresponding to the construction, as nearly as may be estimated.

In the way in which these figures are used they form a perfectly legitimate basis to show what they intend to convey. But they are not and cannot be the same as "historical cost" or "legitimate investment," any more than the value of any of the great inventions when perfected is represented by the worth of the material used to construct the first successful models and valued at the time the material was bought. One might as well base the present value of the real estate on Manhattan Island at the twenty-four Dutch dollars paid for it by the early settlers to the guileless red men.

In the Galveston Electric Company case, reported this week, the Supreme Court speaks of the estimated cost of reproduction on the historical basis; that is, what the property ought to have cost on the basis of prices prevailing at the time the system and its various units were constructed." This is apparently similar to what the New York Valuation Bureau ascertained; except that we know that the New York figure does not include the development costs of changing from system to system as well as those caused by other obsolescence. The Galveston figure may; it is not clear.

Just how extensive the use of such a term would be is another question. It is not difficult to have a concept of the reproduction cost of a property at present prices, because that represents, at least theoretically, the expense of building a similar property at the present time. Nor is it hard to understand what is meant by reproduction cost at 1914 prices, because that would mean that the expense of reproduction is reduced to 1914 unit prices, which some people profess to consider "normal" at the present time. In the same way, the expression "historical cost" or "investment" conveys the definite meaning of the actual expenditure on the property.

But it is impossible to imagine either an electric railway property built today at prices of 1880 or 1890, or one built in 1880 or 1890, which would not have required some expenditures since that time for experimental development. In other words, there is no precedent, either in heaven above or in the earth beneath or in the waters under the earth, for such a manner of construction. It is neither like a property built today without experimental cost but at 1922 prices, nor is it like an old property built at the lower prices of two or three decades ago but with the burden in a new art of having been built at a time when the experience and knowledge of succeeding years were not available.

The facts here related make it clear how important it is that the nomenclature of the valuation business be cleared up—that there be a concise and descriptive expression for the basis of valuation used in New York, lest other mistakes be made in the future by contributors to journals of public opinion.

Maintenance Costs Should Be Kept on a Comparable Basis

ALL electric railway engineers are fond of making cost comparisons, and in fact they are quite necessary if the economies resulting from attention to detail in the various classes of work are to be evaluated. Compilation and comparison of costs furnish a powerful incentive toward increased efficiency, but in order for these to be of value they must include the same items. An example of a variation in practice occurs in the use of the item of carhouse maintenance. Some railways include this item in their rolling stock maintenance costs; others do not. Manifestly this leads to a variation that should be taken into consideration in making comparisons.

The problem of keeping a record of the cost and life of various wearing parts has received considerable attention from equipment engineers. A few roads have reported excellent results from the use of letters or symbols in the accountants' ledgers to designate the several parts of the equipment. The auditor is then in a position to draw off a statement of the quantity used and the cost of any particular part without great trouble. The men responsible for equipment maintenance require such records in order to conduct their work efficiently and the auditing departments are usually ready to co-operate as far as they can. By deciding on a few parts of which individual records are of advantage and then using a system so that these can be conveniently located, accurate cost records can be produced with considerably less work than by keeping individual car records in the maintenance department. If different roads follow the same practice in this particular, their cost figures can readily be compared.

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Controlling Excavations Through Right-of-Way

Montreal (Quebec) Tramways Has Worked Successful Plan of Co-operation with City Under Which Railway Sanctions Digging Operations Affecting Its Track and Is Compensated for Expense Connected Therewith—Plan Has Been in Use for Nineteen Months

BY R. B. GENEST
Chief Clerk Engineering Department, Montreal Tramways

IN MANY cities and towns of the United States and Canada electric railways suffer from the actions of individuals who seem to delight in wrecking their roadbed by digging holes and excavations in the right-of-way, varying in depth from 1 ft. to 30 ft., of various widths, and of shapes geometrically indescribable.

For many years the Montreal Tramways had difficulty in collecting the cost of repairs made to tracks rendered necessary by openings and cuts of all kinds and dimensions made by the city of Montreal road, sewer and water works departments, by utility companies, by contractors and by private individuals. Many such openings were made within a few hours, and often late at night. While the company's inspectors were surveying lines in one part of the city, a contractor's forces would be penetrating the right-of-way in another part, and the opening would be refilled before the inspectors could reach the location and obtain the necessary information.

Liability for payment was denied in a large percentage of cases by the parties responsible for the excavations in the first instance, and prolonged controversies arose between the city departments and contractors as to the responsibility for the damage.

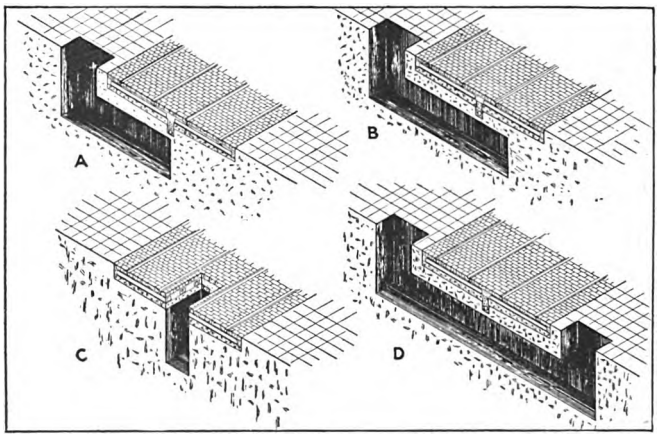
TRACK SUFFERS FROM E CAVATING BY IRRESPONSIBLE PERSONS

According to the city regulations, a contractor or individual, wishing to make a drain pipe connection to a sewer, applied to the city permit department for written authority to open up the pavement in the roadway. The procedure was somewhat as follows: John Doe & Company, house builders and apartment-house erectors, find that they must reach the city sewer in order properly to drain the building under construction. The sewer is located in the middle of the street, directly beneath the devil strip of the tramways' tracks. A call is sent out for expert representatives of the hole-digging fraternity, who have specialized for many years in the business of track wrecking. The services of Messrs. Hammeri & Bango are obtained. A form of contract is drawn up, in which it is stipulated that for the lump sum mentioned therein, Hammeri & Bango agree to deposit with the city of Montreal funds to cover the cost of disturbing the city paving in the vehicular roadway, and to accept all responsibility therefor. But in so far as the paving area within the boundaries of the tramways' tracks is concerned, no questions are asked.

THE JOB UNDER WAY

The excavation is started at the sidewalk curb. When the contractors reach the brow, or a point 18 in. from the outside rail, which is the boundary between the company's right-of-way and the vehicular roadway, the excavation is sloped at an angle of 45 deg. and a tunnel is commenced. A few cubic feet of concrete slab foundation is knocked off by way of testing its strength. An underground telephone line is encountered, and unfortunately a pick point penetrates a conduit. A few feet lower down a water main appears. There seems to be a leaky joint, as the substratum is quite heavy with moisture, and a small stream of water is running down the pipe. However, that is not the affair of Hammeri & Bango.

Excavation is now down 17 ft. The sewer (so the excavators were informed) is 20 ft. below the surface. Street cars roll by overhead; an occasional motor truck bumps across the rails. The sides of the excavation show signs of a cave-in. The diggers decide to go through the surface between the rails in one track and



THE FOUR TYPES OF EXCAVATION SPECIFIED IN THE MONTREAL AGREEMENT

in the devil strip. The paving block is pried up, the sand cushion is swept aside, and the concrete ballast is hammered loose with drills and sledges. A tie rod is in the way, but this can be easily bent to one side with a hammer blow and knocked back into position by the same method, damaged a little but still there.

The concrete slab is a little more difficult, but longer and sharper drills are used and the foundation is soon removed. A little more digging and pounding with bars, and the roof of the tunnel falls in; the worst is over. The roadbed is now well broken up, and 7 ft. or 8 ft. of skeleton track is exposed to view, the rails acting as steel stringers and the ties held to the rail by the spikes. A few lengths of 2-in. plank are inserted vertically against the sides of the excavation, blocked here and there with horizontal braces and forming a rough cofferdam. The danger of a cave-in is now eliminated, and the contractors descend into the hole and remove the balance of the loose material, reach the sewer, lay their pipe and make the connection. The excavated material is then loosely back-filled, and the broken-up paving block set on the surface. The job is completed according to tradition. Messrs. Hammeri & Bango hie themselves to the offices of John Doe & Company, collect their money and are ready to tackle the next wrecking job.

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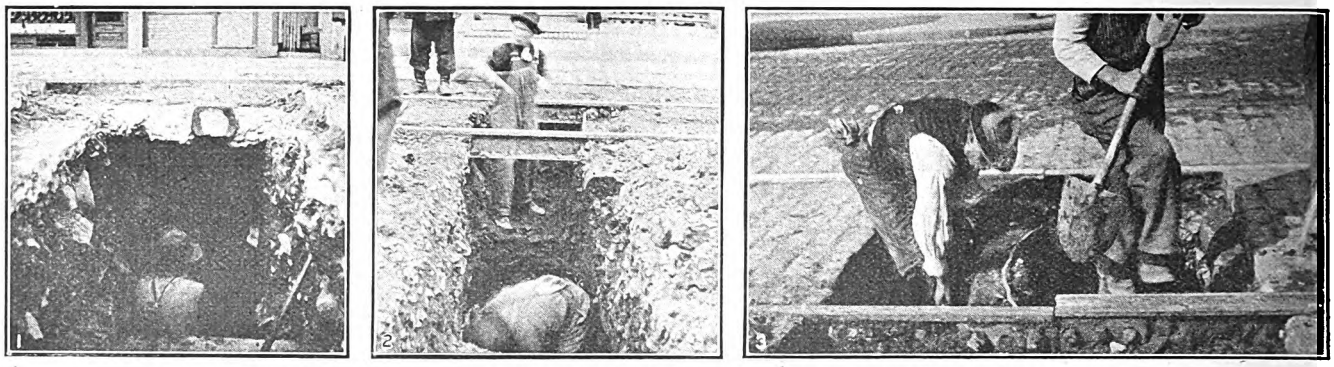


TYPICAL CLASS "A" OPENINGS THROUGH RIGHT-OF-WAY IN MONTREAL

No. 1—He left the paving base, anyway. No. 2—Rails suspended in midair. No. 3—Work of demolition begins.

Next morning the telephone company experiences line trouble in the immediate vicinity in which the wreckers were busy. Diagrams indicate the presence of a conduit in exactly the same location where the drain-connecting contractors were working. The loosely back-filled material is removed, the broken conduit is discovered and repaired and a bill is forwarded to the tramways company. A few days later a digging squad from the gas company appears, to lay a sewer service for the new building and make connections to the gas main, located across the street. The same hole is used, but it is necessary to undermine the remaining track by tunneling in order to reach the main. The now well-loosened excavated material is again thrown back into the hole and the surface is lightly tamped. Both tracks and the devil strip have been broken up and undermined.

About ten days later water begins to spout up through the surface here and there, and a small lake forms. A battalion from the city water works department arrives, accompanied by foreman and sub-foreman, and bringing pumps, jacks, block and tackle and truckloads of sundry material. A citizen who lives in the immediate vicinity regards the operations with disapproval, not knowing whether the workers are employed by the tramways company or the city. The workers seem to be making several holes right between the tracks, and they are also opening up where a hole has already been made. Why, in the name of common sense, the tramways company cannot leave well enough alone is beyond his understanding. It is not a month since the company disturbed the whole district putting down a brand new track and foundation. Inquiry discloses that the city is trying to locate a break in the water main. The break is finally located in the original excavation made by the drain-connecting experts. In the course of a week or so the pipe is made watertight, all holes are refilled and the track is left to settle and sink unmolested.

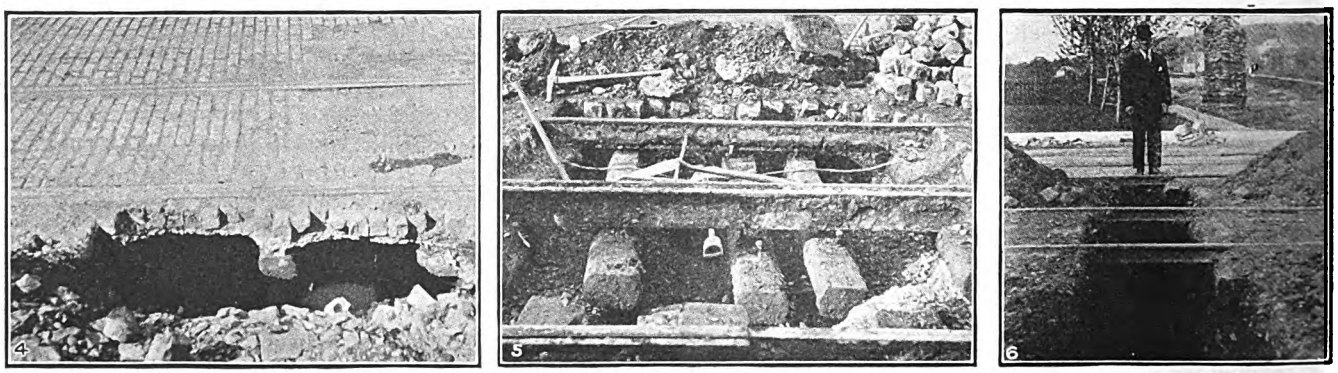
In the meantime the tramways' excavation inspector has been carefully viewing all operations, taking notes and measurements, and record of dates, names and addresses of all concerned, and further increasing the value of his information by several photographs.

MAKING GOOD THE DAMAGE

Finally the tramways' division roadmaster decides to repair the damage done to the track, as there appears to be no danger of further hole digging. A survey of the damaged roadway shows that six different excavations are located in a stretch of 60 ft. The conditions found are: Broken-up paving surface, broken and cupped joints, loose bolts and spikes, bent tie rods, sagged and twisted rail, shortened and cut-off ties, and ballast and foundations reduced to mud. A birdseye view of the track taken from the sidewalk shows a series of short vertical curves, resembling in appearance the general contour of a scenic railway.

The soggy mass now comprising the back-filled material is removed. The sides of the excavation are trimmed and the holes are filled with wet sand, packed and hard tamped. A new concrete slab is laid, joints are repaired, track is relined, concrete ballast is filled in, track is surfaced and new granite paving block is reset and grouted. The roadbed is again in operating condition.

A careful record of the cost of rehabilitating the track is made out by a construction timekeeper covering labor and material in detail. The question then arises as to whom the bills should be sent, and, if it is to be divided among the four parties concerned in the wrecking job, what proportion of the bill should



EXAMPLES OF CLASS "B" OPENINGS THROUGH RIGHT-OF-WAY

No. 4—Combination of "A" and "B" opening, concrete slab and ballast being completely knocked away on outer edge, exposing tie. No. 5—A typical case in this class. No. 6—Will this trench be properly back-filled?

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SOME DEVIL-STRIP, OR CLASS "C" OPENINGS

No. 7—This one will not disturb the track. No. 8—An operation which will require careful back-filling. No. 9—Close work in this devil strip.

each party pay? Finally the account is forwarded to the tramways' accounting office for distribution and a tremendous amount of correspondence accumulates, involving the engineering, claims, accounting and legal departments, and also the utility companies, the contractors and the city departments.

In 1920 two Belgian roadbed wreckers undertook to dig a hole in a single track, which had to be repaired by the company immediately, as the track showed signs of depression shortly after the excavation was filled in. The cost of repairs in this instance amounted to $155. The Belgians, however, disappeared and the city authorities denied all responsibility for the bill.

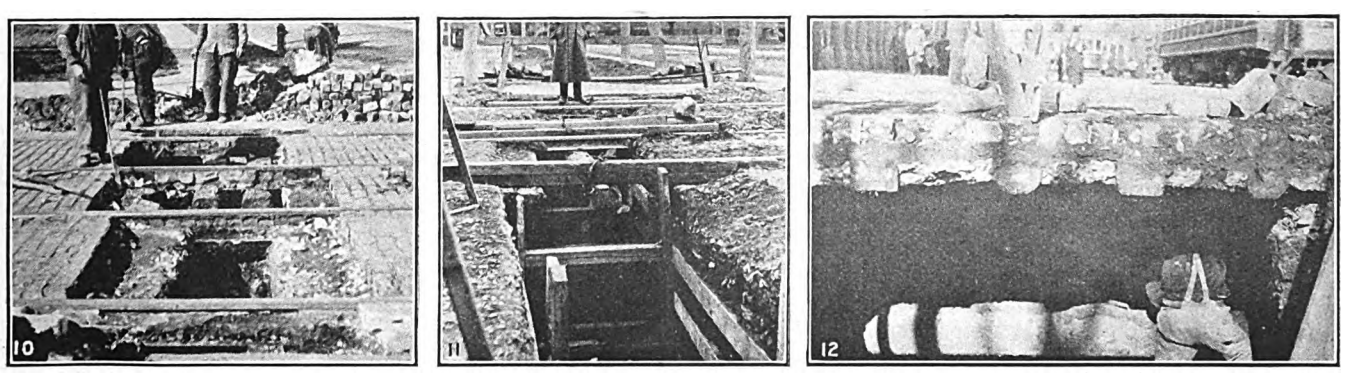
Co-operation Replaces Chaos

According to the operating contract between the city of Montreal and the Montreal Tramways, the company is responsible for the maintenance of the paving surface in the track area but, at the same time, the company has no right or authority to prevent any one from breaking up the paving area.

For many years the Montreal Tramways desired to bring about the institution of regulations to overcome these many difficulties. After several conferences with the city authorities and the Montreal Tramways Commission an agreement was finally drawn up. It was put into force on Sept. 13, 1920. Thus the company succeeded in obtaining some protection. The agreement is as follows:

. . . . Before the city of Montreal will issue a permit to a corporation or contractor to make openings for the purposes of installing pipes or sewer connections, etc., in the streets on which there are car tracks, and where it is necessary to go under the car tracks to reach utilities, the city of Montreal will require the applicant to show receipt from the Montreal Tramways Company, indicating that such applicant has made a deposit to the company covering its expense to make any repairs to the track and roadbed, made necessary on account of the operations of the corporation or contractor. The schedule of prices for doing this work and for the various types of openings shown on blueprint of our drawing No. 586 J.B. will be as follows: Type "A," $60; Type "B," $100; Type "C," $100; Type "D," $155. It being understood that after such deposit is made the Montreal Tramways Company will assume all liability for damage to its property; the applicant, corporation or contractor will, however, temporarily back-fill the opening to make it safe for the passage of the vehicular and pedestrian traffic in the streets. It is further understood that no rebate will be given to the applicant, corporation or contractor, in the event that the cost is less for repairing the damage to such excavations than as stated above, as it is understood that the prices quoted will about even up at the end of the year. The standard form of receipt will be given applicants for permits, which can be exhibited to your permit clerk, at the time of issuing city permit. The company reserves the right to increase or decrease the figures given as conditions may warrant.

This agreement has now been in force approximately one year and seven months, and, outside of a certain amount of difficulty experienced during the first six weeks or two months of its enactment, has proved satisfactory. During the preliminary stages a certain amount of tact was required in dealing with applicants for permits because they were not inclined to look with favor upon such a revolutionary change in the routine. Sporadic attempts were made to evade the regulations but, by exercise of care to detect infringement of the ordinance, the company was able to reduce the number of deposit evaders to a minimum. Instructions were issued to roadmasters, section foremen, and construction timekeepers to notify the head office immediately on discovery that an opening is being made in the company's right-of-way. This information is given to the excavation inspectors, who, between their rounds, report at stated hours to the head office and are, therefore, in constant communication with the construction



MISCELLANEOUS EXCAVATIONS KNOWN AS CLASS "D"

No. 10—This kind of work requires a large deposit. No. 11—The shoring here shows that troubles will result if careful work is not done. No. 12—This man trusts the concreting done by the railway.

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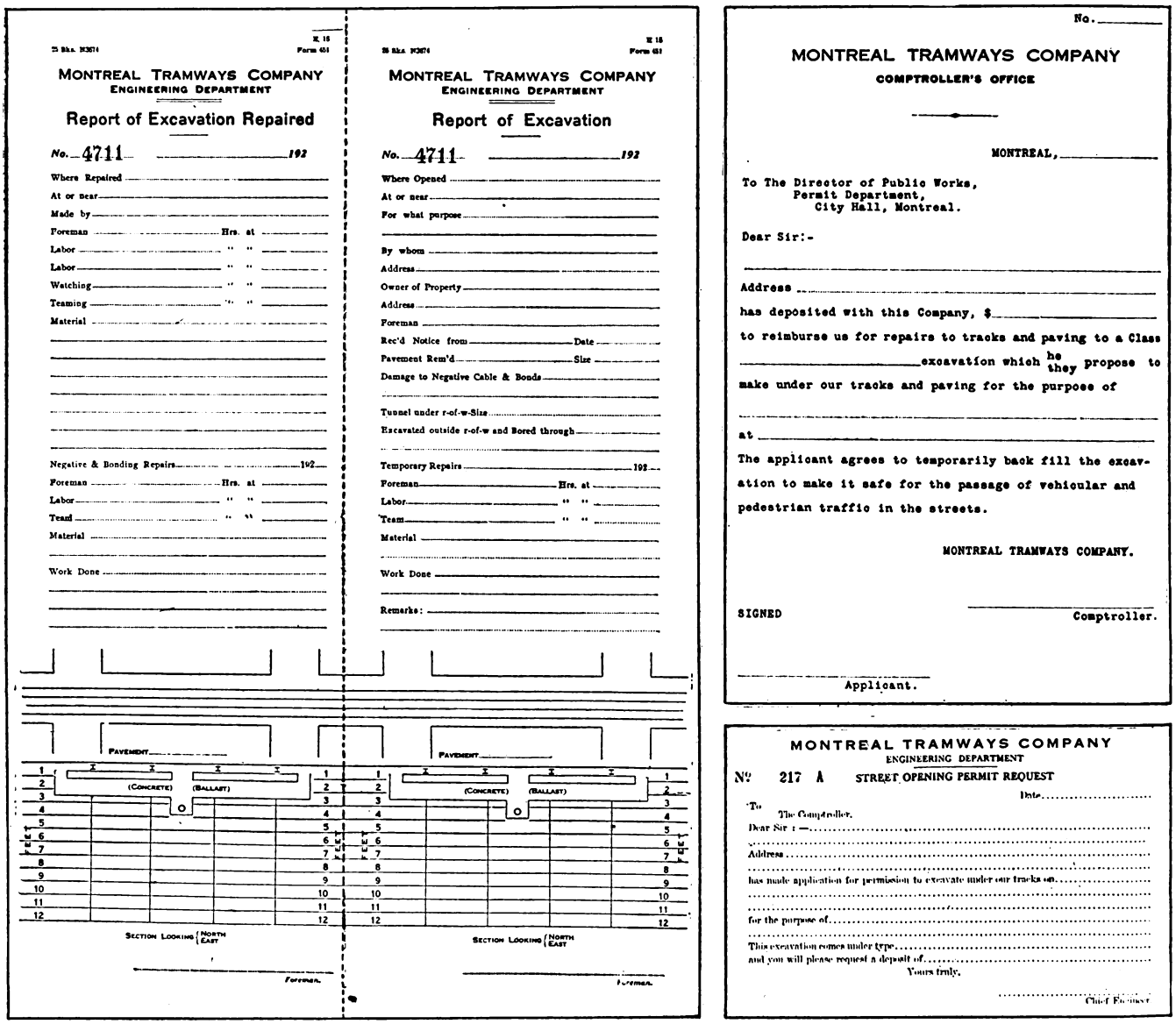
forces. Also, the local police have instructions to prevent penetration of the track area by any one unable to show a company permit.

HERE IS HOW THE AGREEMENT WORKS

Now, if a corporation or individual desires to make an excavation or opening through the right-of-way of the Montreal Tramways he applies to the city of Montreal permit department for a written authorization to open the city streets. He must explain satisfactorily the purpose of the opening. The city request from the engineering department (Form E-54) which is made out in duplicate, a carbon copy retained in the engineering department. The applicant then proceeds to the accounting office, where a deposit is made according to the classification mentioned in Form E-54, and he is given two copies of Form A.1. He is then in possession of the necessary authority to obtain a permit from the city of Montreal. The comptroller immediately forwards two carbon copies of Form A.1. to the engineering department, one of which is retained and attached to the file. The other is forwarded to the



MONTREAL TRAMWAYS COMPANY
ENGINEERING DEPARTMENT

Report of Excavation Repaired

No. 4711 ____ 192

Where Repaired
At or near
Made by
Foreman ____ Hrs. at
Labor ____ " "
Labor ____ " "
Watching ____ " "
Teaming ____ " "
Material

Negative & Bonding Repairs ____ 192
Foreman ____ Hrs. at
Labor ____ " "
Team ____ " "
Material

Work Done

MONTREAL TRAMWAYS COMPANY
ENGINEERING DEPARTMENT

Report of Excavation

No. 4711 ____ 192

Where Opened
At or near
For what purpose

By whom
Address
Owner of Property
Address
Foreman
Rec'd Notice from ____ Date
Pavement Rem'd ____ Size
Damage to Negative Cable & Bonds

Tunnel under r-of-w-Size
Excavated outside r-of-w and Bored through

Temporary Repairs ____ 192
Foreman ____ Hrs. at
Labor ____ " "
Team ____ " "
Material

Work Done

Remarks:

PAVEMENT (CONCRETE) (BALLAST) FEET

SECTION LOOKING NORTH EAST

Foreman.

No. ____

MONTREAL TRAMWAYS COMPANY
COMPTROLLER'S OFFICE

MONTREAL, ____

To The Director of Public Works,
Permit Department,
City Hall, Montreal.

Dear Sir:-

Address ____
has deposited with this Company, $____
to reimburse us for repairs to tracks and paving to a Class ____ excavation which he they propose to make under our tracks and paving for the purpose of ____
at ____
The applicant agrees to temporarily back fill the excavation to make it safe for the passage of vehicular and pedestrian traffic in the streets.

MONTREAL TRAMWAYS COMPANY.

SIGNED ____ Comptroller.

Applicant.

MONTREAL TRAMWAYS COMPANY
ENGINEERING DEPARTMENT

No. 217 A STREET OPENING PERMIT REQUEST

Date.....

To The Comptroller.

Dear Sir:—.....

Address .....

has made application for permission to excavate under our tracks on.....

for the purpose of.....

This excavation comes under type.....

and you will please request a deposit of.....

Yours truly,

.....
Chief Engineer

FORMS USED IN CONNECTION WITH EXCAVATION UNDER TRACK IN MONTREAL

At left—Form E-18, which tells the story of the job. Top, right—Form A-1, used in notifying city of pavement opening authorization. Bottom, right—The originating document, E-54.

departments have drawings showing all streets upon which the Montreal Tramways' lines are operated, and they also know the location of the sewers and water mains. If the applicant plans to penetrate the company's right-of-way, the city withholds the permit until the tramways, in writing, sanctions the application, which is done only when a deposit has been made under the classification indicated on a reduction of the drawing No. 586 J. B. reproduced on page 703, and according to the classification as shown in the agreement above mentioned. The applicant obtains the permit excavation inspector, who then knows that the parties or individuals opening up the street have deposited the necessary sum of money to cover the cost of the opening to be made.

Next, the excavation inspector, having in his possession a copy each of Forms E-54 and A.1., proceeds to the location mentioned as soon as convenient and fills in Form E-18, retaining a carbon copy and forwarding the original to the engineering department head office. Copies of all three forms are then clipped together and placed in an envelope or folder bearing the number

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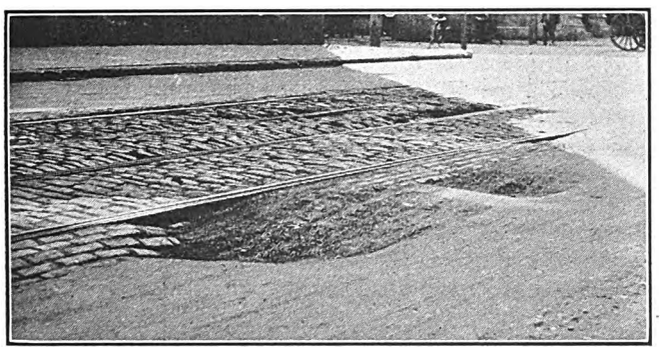
indicated on Form E-18 and filed in rotation of numbers. All excavations or street openings are referred to by the number indicated on the inspector's reports.

In addition to other records photographs furnish irrefutable evidence in litigation in connection with the payment of a repair bill for a street opening. On the Montreal Tramways photographs are made of all openings through the right-of-way, the photographer working in co-operation with the excavation inspector. On the back of each photographic print are noted the number of the excavation appearing on the inspector's report, the date, the location, and the inspector's and photographer's signatures. These men, if called into court to give evidence, are then in a position to supply information of value.

Typical photographs are reproduced to show the different types of opening, as indicated in the captions.

SCHEDULE OF CHARGES PROVES EQUITABLE

As a check on the fairness of the amounts stipulated in the agreement, forty-five different excavation records were picked at random from the file cases and compared.



DEPRESSION OCCURRING IN PAVING SURFACE AS A RESULT OF TUNNELING UNDER ROADBED

The difference between the actual cost of repair work and the sum of money deposited by applicants was found to amount to but $10 on the average.

In some instances it has been necessary to make exceptions from the schedule, for instance, in a case where the same opening might be used by two different city departments, or where a Class "A" opening has been extended to a Class "B" opening, or where the tramways was about to renew its track foundations. It would not then be reasonable to exact the full payment according to the agreement. The exceptions, however, have not caused any great difficulty, and, generally speaking, the operation of this agreement has been a success.

Technologic Papers of Bureau of Standards to Be Indexed

BEGINNING with No. 203, the pages of the Technologic Papers of the United States Bureau of Standards will be consecutively numbered to facilitate binding in volumes. Papers in the series will be paged consecutively until 750 pages are reached. The title page and index (issued separately) will be transmitted with the last technologic paper of each volume to subscribers who receive the complete series.

A descriptive list of all Bureau of Standards publications issued since the establishment of the bureau has been issued. This "Circular No. 24" may be had free on application to the Bureau of Standards, Department of Commerce, Washington, D. C.

New York State Railways Organized for Safety

Superimposed on a Continuous Accident-Reduction Campaign Covering Several Years, a Special Organization Made Effective This Year Is Already Producing Remarkable Results

BY A. W. KOEHLER
Director of Safety, New York State Railways, Rochester, N. Y.

BELIEVING that through organized accident prevention the burden imposed upon the company by needless accidents might be considerably lightened, the New York State Railways on Jan. 1, 1922, created an accident prevention department. The efforts of this department are being guided by a program which has been designed to embrace in its ramifications all of those features which have proved successful in the elimination of preventable accidents in industry.

The underlying conviction in this work has been that, to be successful, any movement which has for its purpose the reduction of accidents must be a co-operative one; motorist, pedestrian and trainmen must each subordinate his own immediate convenience and desire to the best interests and safety of the public. In addition to being co-operative, it must be continuous and follow some well-conceived plan as opposed to spasmodic or sporadic campaigns, characterized by hysterical display or propaganda of doubtful value.

Although in operation only a few months, the preventive measures employed by the State Railways already give promise of satisfactory results. Accidents from all recorded sources show a perceptible decrease. It may be fair to assume that this decrease is not due entirely to a favorable combination of events, but has resulted at least in a measure from methods adopted toward that end.

The creation of an accident prevention department by this company does not mark its entry into a new field. R. E. McDougall, formerly claim agent of the company and now general manager of the New York & Harlem Traction Lines, New York City, while in Rochester devoted a considerable portion of his time to safety. He stimulated an interest in accident prevention on the part of employees of the company through friendly competition. A silver loving cup offered to the station having fewest accidents during a given period was spiritedly contested for, and its possession was a matter of pride to the winner.

The results that attended these earlier efforts and the growing conviction on the part of officials of the company that accident prevention might further benefit the company and the community led to the formation of this new department which is devoting its entire energy to the work of safety.

FIGURES SHOWING REDUCTIONS IN ACCIDENTS OF VARIOUS KINDS

A comparison of accident records for the month of February with those of January of this year, as well as with February of last year, shows a reduction that is not confined to any one class of accidents but is evident in every recorded classification. The reduction over February, 1921, is 11.3 per cent, and over January of this year is 24 per cent. Comparing the records of January and February of this year, we have the following classifications and their corresponding reductions: Collisions with motor vehicles, 28 per cent; collisions

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other than motor, 20 per cent; collisions with pedestrians, 62½ per cent; collisions with cars, 7.69 per cent; derailments, 35.48 per cent; employees injured, 57.14 per cent; alighting from cars, 7.14 per cent; boarding cars, 27.87 per cent; injured on cars, 8.51 per cent; damage to company's property, 22.76 per cent; miscellaneous, 13.33 per cent.

These results have been secured because eight to nine hundred men are alert and keenly observant of conditions or practices that make for accidents. Each day's reports bring to the accident prevention department a fund of information that makes it possible to deal intelligently with the accident situation.

THE TRAINMEN'S TRAFFIC REPORT

Records of violations of traffic ordinances on the part of motorists are most numerous. Of these the most frequent is the passing of a standing street car while the latter is taking on or discharging passengers. Since the advent of the "trainmen's traffic report," a sample of which is reproduced, violations of this sort have shown a marked decrease. "Stunts" by boys, such as stealing rides, hanging onto the sides of cars while riding bicycles, riding on the fender and similar dangerous practices, have also been reported and steps have been taken to discourage such acts of recklessness. In this work the schools are co-operating to a commendable degree. Motormen and conductors, inspectors, division superintendents and all of the various departments are co-operating to achieve the greatest possible reduction of accidents.

FORM 440N

New York State Railways
Safety Department
Trainmen's Traffic Report

Date March 28-22. Hour 10 A. M.
Place Main and State Sts.

General Description and Remarks
Auto passed standing car, from which persons were alighting, at high rate of speed. Nearly struck woman.

License No. (if vehicle) 307-707
Reported by Chas. P. Smith
Motorman No. 1356
Conductor No. 1335
Line Central Park and Jefferson
Car No. 457
Car Going Outbound.

Use Other Side for Additional Information

A SIMPLE FORM OF REPORT WHICH IS ACCOMPLISHING MUCH IN ROCHESTER

Safety committees have been appointed and are functioning in excellent fashion.

Points of contact are being established with all of the various agencies which might be instrumental in contributing to the success of the efforts as a whole. Of these, favorable mention is due the police department, whose active co-operation is a large factor in eliminating the hazard created by the reckless motorist, who passes at a greater speed than is compatible with safety a car which has stopped to discharge and take on passengers, or who otherwise endangers the lives of street car patrons.

The medium through which the information concerning the violation just mentioned is conveyed to the police is the trainmen's traffic report, already mentioned. Motormen and conductors are supplied with blank forms for these reports and on them notify the accident prevention department of any hazardous conditions or practices observed by them while operating cars over their different routes.

Another feature, the efficacy of which is making itself manifest, is that of writing a letter to some responsible person in a firm whose truck or wagon driver has violated a traffic ordinance. This letter advises the owner of the particular offense of which his driver has been guilty, the possible consequences are called to his mind and his co-operation to prevent a recurrence is sought. In every instance the reply to such a letter has brought assurance of the desire of the recipient to co-operate with us and his thanks for apprising him of dangerous practices indulged in by his drivers. Information regarding such practices is conveyed to the accident prevention department, also through the medium of the trainmen's traffic report.

Safety messages to the car riding public will be carried each week on cards in the car. These cards will bear the heading "Trolley Flashes" and will convey a different message each week. In addition, from thirty to forty thousand employees of industry will be reached through safety talks at their respective plants and articles published in the house organs of their employers.

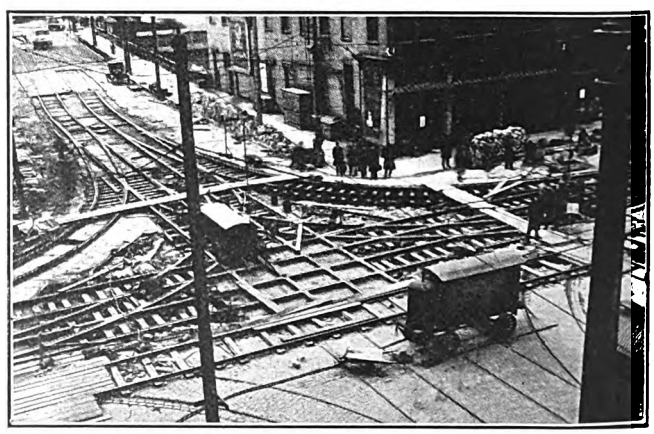
The schools too are co-operating actively by providing opportunity for safety talks to the pupils. These talks emphasize the ways in which school children can do their parts in assisting in our accident prevention measures.

From time to time the newspapers will be given articles dealing with the progress of our efforts, so that the subject will be kept constantly before the public.

Through these sources, and such other avenues of approach as may be opened to us, "Safety" will be brought to every man, woman and child in the community, and thus, in due time, marked reductions in accidents are inevitable.

Large Layout of Chrome Nickel Steel Special Trackwork

THE Milwaukee (Wis.) Electric Railway & Light Company is installing its first general layout of special trackwork made of chrome nickel steel, having originated the idea of the use of this metal in connection with steam road crossings in 1920. The full particulars about this type of special trackwork were published in ELECTRIC RAILWAY JOURNAL, Vol. 55, page 799.



NICKEL CHROME STEEL LAYOUT GOING IN AT EAST WATER AND MICHIGAN STREETS, MILWAUKEE

The Philadelphia Rapid Transit Company and one or two other street railway companies have since installed a number of chrome nickel steel layouts. Most of these and the one pictured herewith were manufactured by the Lorain Steel Company.

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Notes from Southern Cities

Railways in South Active in Improving Properties Along Modern Lines—Chief Handicaps Are Jitney Competition and the Present Industrial Situation, Brought About Because of the Low Prices Being Obtained for the Principal Agricultural Products of the South

THE Birmingham Railway, Light & Power Company has been in the hands of a receiver since Jan. 23, 1919, but the property has been well maintained under the receiver and considerable reconstruction of cars and tracks has been done. With the revival of the steel industry, on which the city of Birmingham and neighboring communities largely depend for their prosperity, the benefits of this rehabilitation will become apparent. The Birmingham Railway, Light & Power Company is one of the group of American Cities Company properties now being reorganized. It has 154 miles of track and several long interurban extensions.

Birmingham is a city of recent growth, so that the main streets are wide and there is not the same street congestion as in many other cities in the South. From the railway point of view the wide streets have the disadvantage that they provide ample parking space for automobiles, and the competition from this source is considerable. Since 1915 there has also been some jitney competition, due largely, it is probable, to the unemployment situation in the steel industry. The jitneys number about fifty or sixty and charge various fares ranging from 10 cents to 7 cents, against 8 cents on the trolley, but they do some business, because of their higher speed.

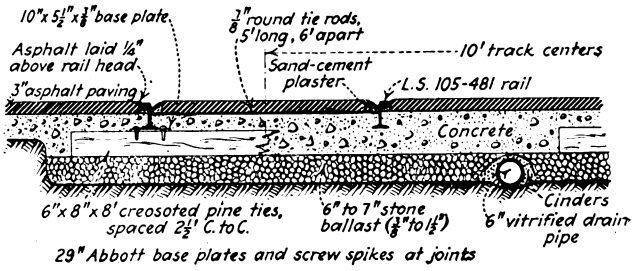
One step being taken by the company to meet this competition of jitney and private automobile is to provide more units by reducing the number of trailers and by operating more motor cars. By this means also the average speed is increased. A number of one-man cars have also been put in service. One hundred per cent one-man operation is not contemplated, but the company believes that it can use still more one-man cars to advantage.

Only one bus line has been started in Birmingham. This was promoted by the owners of a real estate development in the northern part of the city and was continued for about six years. It proved a losing venture, and an arrangement has been made within the last year between the land company and the trolley company by which the latter agreed to extend its tracks into the development and supply the necessary service. The buses were then withdrawn.

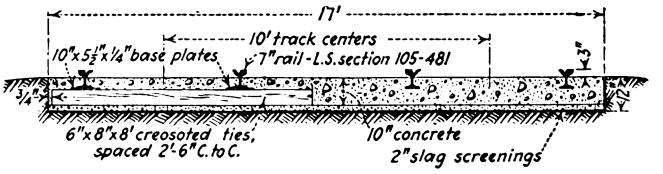
As with a few other companies, transfers are punched with the point of origin rather than the line to which the passenger wishes to transfer. The principal advantage claimed for this plan is that it saves the time of both conductor and passenger and avoids any dispute owing to misunderstanding between the two. The company is protected against looping by a provision printed on the back of the transfer that a passenger is not permitted to return on the transfer to a point near that from which he started.

A campaign directed against accident reduction was begun last year through an offer to the employees to divide among them 50 per cent of all the saving in the accident account over the average of the three previous years. Under this plan, during January, 1922, each man got $4.07. Shop men share in the division as well as trainmen, as they are held to have as much to do with the safety record as the trainmen. The latter are warned that the claim department requires complete reports of all accidents to assist in keeping down the cost of accidents. The result of this policy has been shown in the quality of the reports rendered of all accidents.

In new track and in track reconstruction in paved streets the company is using a 7-in. 105-lb. girder rail,



STANDARD GIRDER TRACK CONSTRUCTION ON PAVED STREET IN MEMPHIS



SPECIAL SHALLOW CONSTRUCTION IN MEMPHIS USED ON VIADUCT

or a 7-in. 101-lb. T-rail. Under special work the practice is to employ an 8-in. x 10-in. oak tie, but elsewhere to use creosoted pine ties. With a 7-in. T-rail a six-bolt 34-in. angle plate is used, welded top and bottom except at the extreme ends. Some work has been done during the past year in taking out left-handed turns in the downtown streets. Owing to the practice of the company to collect fares pay-enter inbound and pay-leave outbound loop operation in distinction from through operation is favored.

MEMPHIS

The Memphis Street Railway has constructed about 4.2 miles of track during the past year. Creosoted pine ties have been used in all new work. Although these cost $1.10 each at present as compared with 70 cents for untreated oak ties, the additional life of the creosoted ties is considered to warrant this additional expense. The Lowry process or creosoting is used. In some old track, which had been down thirty years and was recently taken up, certain of the creosoted ties were found in such good condition that they were used over again.

The standard track construction in Memphis in paved streets is shown in the accompanying section. The tie rests on 6 and 7 in. of stone ballast with concrete around the ties and under the rail. The joint is made with an eight-hole joint plate and an Abbott base plate. The former is electrically welded to the rail and the latter is screw-spiked to the tie and also electrically welded

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to the base of the rail. No bonds are used except in special work. Screw spikes are used at joints and nail spikes elsewhere. The standard paving is asphalt with no headers or stretchers against the rail.

The principal matter of electric railway interest in Memphis is, of course, the operation of the property under the service-at-cost plan inaugurated in 1921, but this subject will be treated in a separate article.

Through co-operation with the city considerable reduction has been made in street congestion. Part of this was accomplished by rerouting and part by stricter enforcement of traffic ordinances. In consequence it has been possible to increase the scheduled speed of cars to 10.1 m.p.h., which is the basis on which all schedules are figured for the entire system. On Main Street, the principal business street, the scheduled speed has been increased from about 5 m.p.h. to more than 8 m.p.h. Under the new ordinance traffic checks are made frequently to determine the demand for transportation. Motormen and conductors are used for this purpose. Their figures are sent to the office and tabulated and charted.

AUGUSTA

Augusta has been undergoing a discontinuance of service, owing to jitney competition, which has been described in the news columns of this paper. For some time the Augusta railway, like some other railways in neighboring cities, has suffered from loss of traffic due to both private automobile and jitney. In the Southern States as a rule the country roads are poor, but for a short distance out from interurban centers they are generally in good condition and the absence of snow in winter encourages automobile driving for twelve months in the year. Residents in the Southern States are proverbially hospitable, and many a potential passenger on an electric railway is "given a lift" by a friend or even a stranger who is passing his way in a private automobile. On the other hand, the color line is drawn as strictly by jitneys as on the street cars or steam railroads. The result is that in most cities a jitney has to be either a "white" jitney or a "colored" jitney. This hampers their development to some extent.

The company has tried various methods of increasing traffic. One is to post at important boarding points time cards showing when cars pass that place. As a fifteen-minute service is run on many of the lines, this practice has been helpful. A force of four inspectors is employed, mostly in the center of the city, to check the passing time of the cars against the scheduled time, and the superintendent and assistant superintendent also do considerable checking.

The cash fare in Augusta is 10 cents, with tokens sold five for 40 cents. On the Augusta-Aiken division, 24 miles, there are eight 8-cent zones.

CHARLESTON

In Charleston there is a variety of fares. The cash fare is 7 cents, with a cash fare of 3 cents for children up to ten years of age. Tickets are sold four for 25 cents. There are two kinds of employees' tickets, one for people employed in the offices of the company, and these tickets are stamped with their names. There is also a form ticket for workmen used around the power plant and repair shop and on construction work. In addition, the company has a form ticket used on the through cars to North Charleston. This route has two zones, and besides the tickets already mentioned a special rate is available on this line of 20 cents for a round trip (instead of 28 cents) if the ticket is used between 5:40 and 8:30 a.m. and 4:20 and 6 p.m. This ticket is sold only in lots of six round-trip tickets for $1.20. Thirty per cent of the business of the company is done for cash and the rest in tickets. Two registers are employed, one for tickets and one for cash. The transfers for January, 1922, were 7.36 per cent of the revenue passengers. At present paper is being used for all of the tickets, and one of the problems before the company now is whether to substitute metal tokens for paper and how to collect both cash fare and tickets. Each plan is considered to possess certain advantages.

There is considerable jitney competition with the Charleston railway, but at present this comes entirely from individuals. Some time ago a regular bus company was organized to operate twenty cars, each seating ten persons, but this company has gone out of business. The railway company has about thirty-three one-man cars and is converting some others to one-man operation. Like other of the older cities, Charleston suffers because those who laid out its main streets did not realize the demands for street space which the twentieth century would bring. King Street, Charleston's prin-

PLEASE HAVE EXACT FARE READY ON BOARDING CARS

SMILE A WHILE

SAFETY-FIRST

CHARLESTON CONSOLIDATED RAILWAY & LIGHTING CO.

Tri-Service

Happenings in Cardom

CHARLESTON CONSOLIDATED RAILWAY & LIGHTING COMPANY

Tri-Service

THERE IS NO SUBSTITUTE

WE WANT TO KNOW

PAGES FROM "TRI-SERVICE," ISSUED SEMI-MONTHLY BY THE CHARLESTON CONSOLIDATED RAILWAY & LIGHTING COMPANY

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"Chats with the Consolidated"

"The Effect of Automobiles on Street Car Travel"

Has it ever occurred to you that automobiles have contributed largely to the position in which the street railway at present finds itself? Well, it is a fact that they have. Not only have we lost the fares formerly paid by the auto owners and members of their families, but thousands of fares are lost through auto owners "picking up" friends going to and from work in the mornings and afternoons.

How often have you stood on a street corner waiting for a street car, perhaps with several other folks, when just before the street car arrived an auto drove up and the would-be street car riders were invited to ride "as far as I go?" Each passenger thus lost reduces our revenue, and has a direct bearing upon the service we render.

We appeal to the auto owners to assist us in rendering a more satisfactory service to the people of Charleston by discontinuing this practice and thereby direct these fares into the proper channel. A prosperous street railway rendering an essential service is of greater value to the community than are the few cents to the individuals who are occasionally "picked up." Please allow those who would to patronize the street cars.

Your Co-operation Is Requested and Will Be Appreciated

CHARLESTON CONSOLIDATED RAILWAY & LIGHTING COMPANY

cipal business street, for example, is only about 35 ft. wide from curb to curb. The company is doing what it can to relieve this situation by speeding up cars, cutting out unnecessary stops and in other ways. The headway on most lines is ten minutes in winter and a shorter time in summer.

In Charleston the railway, electric lighting and gas services are all owned by the same company, and publicity is conducted through a regular department serving all three departments. Newspaper space and car folders are used.

A feature of the newspaper space is a series of friendly talks, called "Chats," carried in each of the three papers in Charleston on Tuesday, Thursday and Saturday. This series was begun July, 1921, and the space taken is usually one column wide and 8 in. deep, but this space is varied. Typical "Chats" on the railway system are reproduced on this page. Three prizes, all in car tickets, of $50, $30 and $20 were offered for the first, second and third prizes on May 4, 1921, "Electric Railway Day," for an essay on the advantages of electric railway cars as applied to Charleston. The paper which received first prize was a well prepared article which gives in detail the advantages to real estate owners, to school children, for social and recreational purposes, etc.

The car folder is entitled "Tri-Service," and the pages of a few recent issues are reproduced. Three departments are carried, named respectively "Smile-a-While," "Safety First" and "Happenings in Cardom."

"Chats with the Consolidated"

BACK TO NORMALCY—

Use Your Street Cars More

Saving is at the bottom of it. Our savings must repair the waste of war in addition to performing the usual job of developing our resources.

The man who rides the street car instead of using more expensive transportation is to be congratulated. He is helping the country by adding to the heaps and savings that will bring us back to normalcy.

He is helping himself by increasing his stake in the country through saving. He is helping the community to maintain a service that is vital to it.

The service he buys when he rides a street car is second to none in the country. The price he pays is reasonable. We repeat—he is to be congratulated.

"Patronize Your Street Cars"

CHARLESTON CONSOLIDATED RAILWAY & LIGHTING COMPANY

CHARLESTON-ISLE OF PALMS

The Charleston-Isle of Palms Traction Company's line is right across the bay from Charleston, with which it has connection by ferry owned by the company. The principal business is in summer, when all of the forty-two cars of the property are operated.

The usual method of operation is to send out a motor car with trailer followed by a motor car, as the line does not have loops at its terminals. On the arrival of the two-car train at the end of the line, the following motor car couples up to the trailer, which is uncoupled from the first motor car.

This line has the distinction of having raised fares during the last five years from 30 cents to $1.30 for the round trip.

Getting a British Franchise

THE procedure of getting authority to build a street railway of any kind in Great Britain is quite complicated. Many of the British tramway properties are municipal, but even a city cannot build a trolley line within its boundaries without getting a special bill through Parliament authorizing it to do so. If the undertaking is a private one, Parliament will not even consider the application unless the local authority, town or county council, approves. In London a somewhat different condition prevails. There the County Council is the tramway authority, but the local borough councils in London are the road authorities, and in most cases they possess power of veto and often exercise it.

Buses are on a different basis. If the local authorities wish to go into the bus business, they must get Parliamentary powers in which the routes are specified. If a private company wants to start a service, all it needs is to get the consent of the local authorities and licenses for the buses. If the proposed bus routes are likely to compete with the municipal tramway routes, the licenses probably will be refused. For interurban service where no such competition question arises, licenses apparently are secured for the asking. In London here also the condition is different. Neither the London County Council nor the metropolitan borough councils seem to have any say about buses. They are licensed by the Metropolitan police authorities, and their routes are regulated by them and by the Ministry of Transport.

One great reason for the great development of buses in London is that tramways are excluded from a considerable part of its area, including the downtown business and financial section known as "The City," and also from the fashionable West End.

After experimenting with double helical gears for the 2,500-hp. electric locomotives for the Gothard section, the Swiss Federal Railways has adopted the Maag spur gearing with case-hardened and ground pinion teeth. The wheel teeth are of unhardened steel. For the State Railways the pinion will be made of case-hardened chrome-steel and the wheel rim of forged steel.

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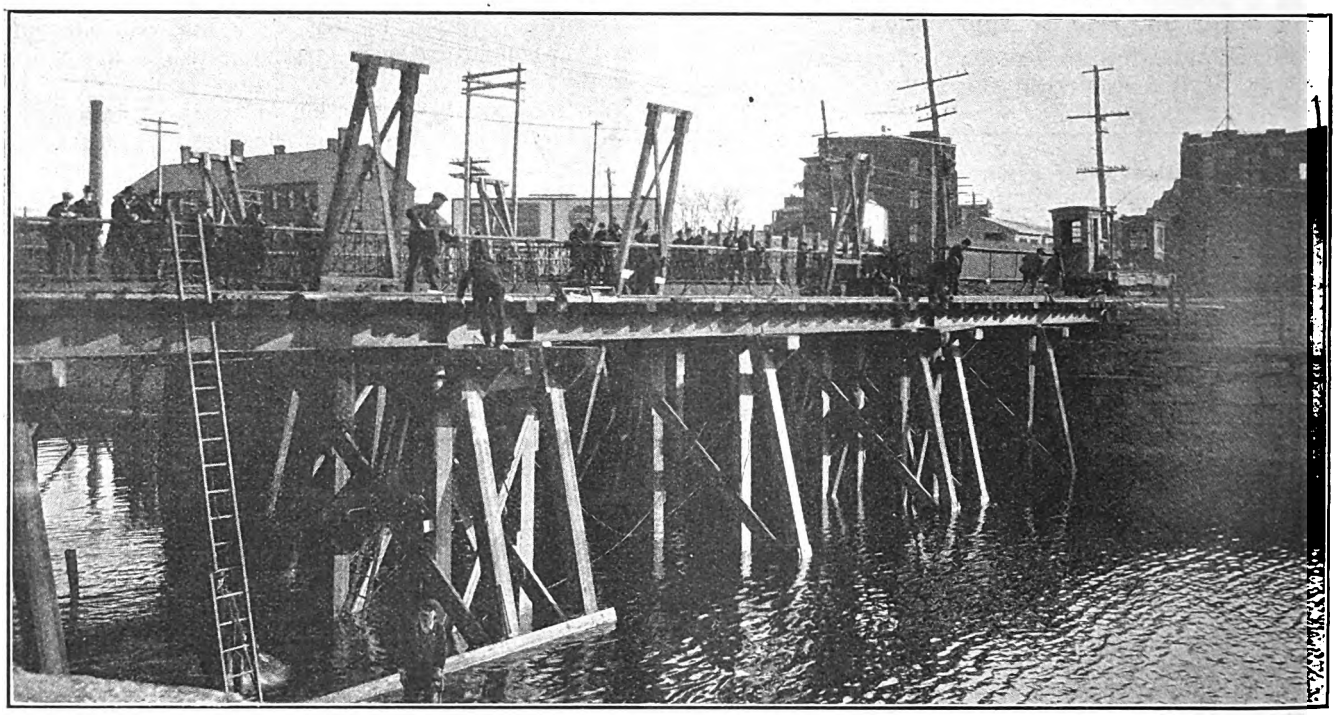
Electric Railway Bridge Built in Eleven Hours

Holyoke Street Railway Faced the Problem of Providing a Temporary Canal Crossing Instanter or Discontinuing Important Service for an Indefinite Period

EARLY in December, 1921, the engineering department of the Holyoke (Mass.) Street Railway, under the direction of George E. Pellissier, assistant general manager, did a remarkably quick piece of temporary bridge construction under circumstances which made this work espcially difficult.

This emergency job was necessary on account of a misunderstanding as to temporary diversion of electric railway traffic during the construction of the new "Valley Bridge" over the second level canal in Holyoke. The railway company was not informed that no provision for this had been made until it was almost too late to draw down the water in the canal to permit the erection of cribwork in its muddy bottom to support horses or bents for a trestle. However, with only five days available to secure the material necessary for the trestle, to fabricate it and to deliver it at the bridge site, and only one day available to erect the structure, the railway undertook the work. In explanation of the shortness of these periods, it should be said that on account of the ice it is impossible to draw the water out of the canals during the winter, and in the present case the water had been drawn out of this canal, presumably for the last time, two weeks prior to the day when the bridge was scheduled to be put in, namely, Sunday, Dec. 11. Fortunately weather conditions early in December were favorable, and it was possible, through the courtesy of the Holyoke Water Power Company, to draw the water out of the canal once more. It required until 11 a.m. Sunday to do this, however, and as the paper mills which draw water from this canal all had to resume operations early Monday morning, it was necessary to let the water back into the canal beginning soon after midnight. A total of but fifteen hours was available from the time the first work could be done until the job was completed and all materials, tools, etc., had been removed by the company from the canal bed.

The importance of this railway connection can be appreciated from the fact that about 300 cars cross the trestle each day and the entire community of South Hadley and Amherst would have been cut off from trolley connection with Holyoke unless the temporary bridge had been built.



BUILDING A BRIDGE IN ELEVEN HOURS AT HOLYOKE, MASS.

The technical details of the construction are more or less standard and can be comprehended from the drawing reproduced. Soundings made before the water was drawn out showed that the canal bottom was soft ooze. Provision was made, therefore, for building cribwork on the bottom and timbers were framed to make up seven supporting horses. The horses were framed near by and slid into place by means of rollers and a donkey engine. The steel I-beams were lifted into place by means of the rigging shown in the accompanying drawing, in the following manner:

These horses were framed on the banks of the canal while the steel beams were being assembled and bolted together in three sections, each 50 ft. long. On two sections of steel work, one on either side of the canal, two complete horses were placed and the steel sections with their horses were mounted on rollers on the banks of the canal. While the water was being drawn out of the canal these steel sections were hauled out over the canal by means of a donkey engine (the only power

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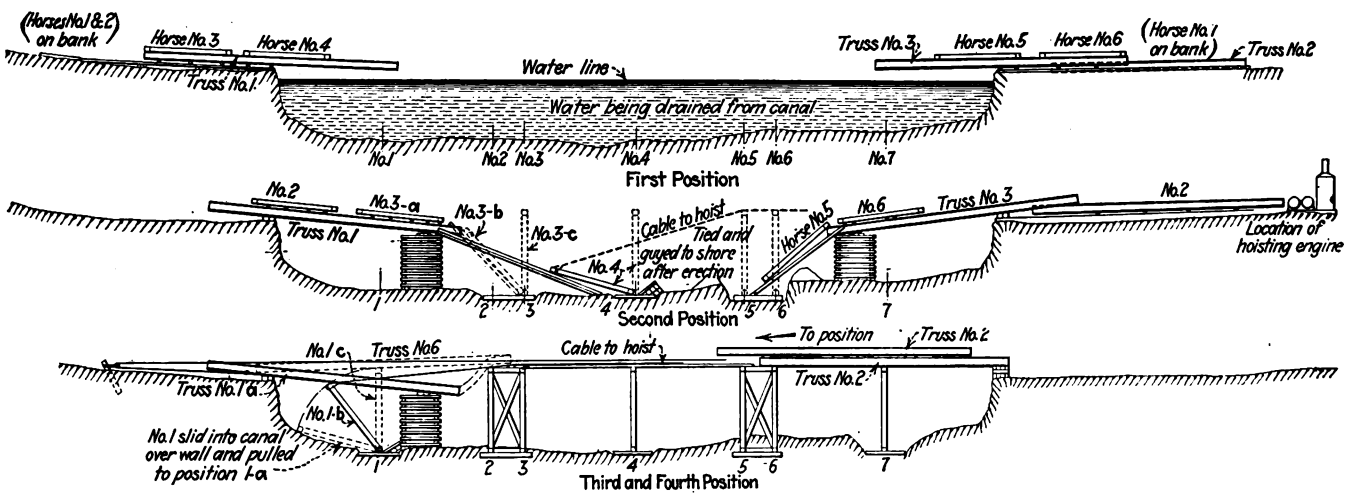


STEPS IN PROGRESS OF ERECTING BRIDGE WITH LITTLE MACHINERY AT HOLYOKE

equipment available for the job) until the sections were practically balanced on the edge of the wall.

As soon as the water was out of the canal a crib was made of ties on the bed of the canal under the ends of the projecting steel beams just high enough so that when the steel beams were tipped down they would strike a roll on top of the crib and slide right into place with one end of the beam resting on the bed of the canal. The two horses on these beams were thus deposited practically in their proper position and, being on an incline, very little effort was necessary to pull them into upright position and bolt them together to form the double horses or piers which are shown in the accompanying elevations.

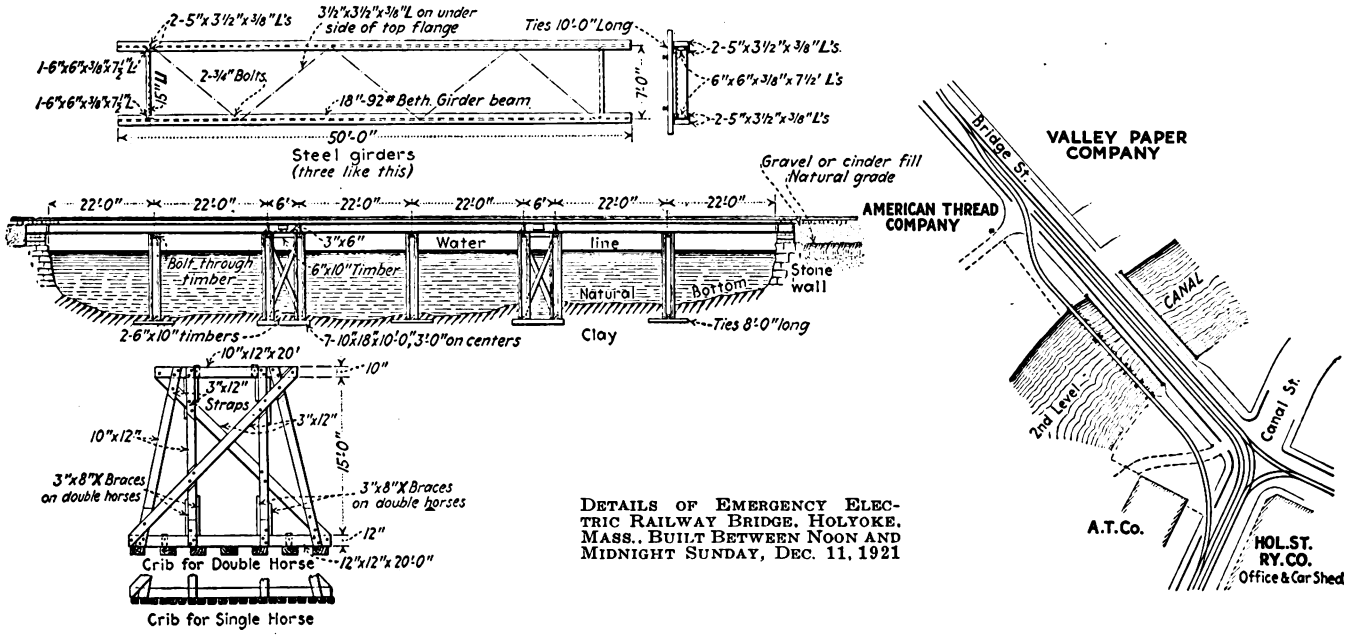
The intermediate horses were then dropped over the wall of the canal and placed under the steel beams resting flat on the bottom but with their bases in their final position. A couple of stakes were driven to keep these bents from sliding and a line from the donkey engine to the top of the bents pulled them into an upright position. As they came up they lifted with them the two steel beams, which of course would then be in their final resting place. One of the sections was then used for a run to roll out the middle section end of the trestle, using the donkey engine for motive power.

Thermal Relay for Apparatus Protection

A LINE of thermal relays has been developed by the Westinghouse Electric & Manufacturing Company, which permits control of the circuit in such a way as to open it approximately when a piece of apparatus to be protected has reached a predetermined temperature. This is accomplished by providing in the relay a certain amount of resistance and of thermal capacity so that its temperature rises substantially with that of the apparatus to be protected. By adjustment of the relay the temperature at which it will open the circuit can be predetermined.

The operating mechanism of the relay consists of a number of sheets of thermostatic metal arranged in series or in parallel and with varying resistance, according to the desired current-carrying capacity. A contact is attached to one of the elements and is normally held with an initial tension against a stationary contact. At the proper temperature the bending of the thermostatic metal takes up this initial tension and the contact opens, thus opening the holding coil of a small circuit breaker to open the main circuit.

The relay may be provided with a pointer to indicate its temperature and thus furnish a guide to the temperature of the machine which it protects.



DETAILS OF EMERGENCY ELECTRIC RAILWAY BRIDGE, HOLYOKE, MASS., BUILT BETWEEN NOON AND MIDNIGHT SUNDAY, DEC. 11, 1921

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When Preservative Treatment of Wood Is an Economy

ALTHOUGH any set of timbers may be made more resistant to decay by preservative treatment, such treatment may not always be economical, even though the timbers are to be exposed to the most severe fungus attack. If the timbers are to be in service for a short time only, durability is unimportant, and any kind of preservative treatment would obviously be a waste of money. If, on the other hand, the wood is naturally of low durability and is to be used in a permanent location, it is easy for preservative treatment to show great savings. Between these two extremes there are any number of instances in which it is a more difficult problem to determine whether or not preservative treatment will pay. The United States Forest Products Laboratory has compiled some valuable information along this line, which is abstracted below.

If a timber user knows the average life that treated and untreated timbers are giving and the cost of each in place, he can easily compute, with the use of the accompanying table, the relative annual costs of maintaining the two. Assume as an extreme case, for example, that untreated timbers are giving an average life of two years and that their cost in place is $6 per set. Assuming an interest rate of 7 per cent, the table shows that timbers which need replacement every two years cost annually $0.553 on every dollar of their cost in place. For the $6 set, then, the annual maintenance cost would be 6 times $0.553, or $3.32. Treated timbers, the user may find, give an average life of fourteen years and cost $7.50 per set in place. The annual charge on timbers with a fourteen-year life is found in the table to be $0.116 on each dollar of their cost in place. The annual cost of maintaining the $7.50 treated set, therefore, would be 7.5 times $0.116 or $0.87. Preservative treatment, then, would save this user annually $2.45 per set.

If a timber user knows the cost of treated and untreated timber and the average life of the untreated timber only, he can estimate how long treated timber would have to last to be as cheap as untreated timber. In the case discussed above, the untreated timber cost $6 in place; the treated, $7.50; and the untreated timber was lasting two years. The annual charge on the untreated set was found to be $3.32, and since the annual charge on the $7.50 treated set is to equal this, we may set up the equation, $7.5 \times y = \$3.32$; then y (the annual charge on $1 expenditure) $= \$3.32 \div 7.5$, or $0.443. Referring again to the table and looking along the 7 per cent interest rate now, we find that an annual charge of $0.443 on the dollar falls between the two-year and three-year columns and evidently at a point equivalent to about a 2¾-year life. It can readily be seen from this that if treatment adds only three-quarters of a year to the life of the timbers, it would pay for itself, and the user could be sure from the experience of others that it would add much more than this and would therefore be profitable.

Advertising on Berlin Transfers

IN BERLIN, owing to the high cost of railway operation, advertising is being printed on both the front and back of transfer tickets and fare receipts. Some of this advertising is artistic, as shown by the advertise-

BERLIN TRAMWAY TICKETS CARRY ADVERTISING ON FRONT AND BACK

ment of the dealers in musical instruments on one of the tickets reproduced. In this case a verse of poetry is begun on the front of the ticket, and if the reader wishes to see the rest of it he has to turn to the back of the ticket, which carries the full advertisement of the dealers. The shoe dealer on the front of the transfer says simply that "the greatest bargain sale is at," creating curiosity on the part of the reader to see where the sale is taking place.

The charge for a single fare on the surface lines of Berlin is now 2 marks, and it is stated that the fare will probably be increased to 5 marks in the early future. Before the war a mark was worth 24 cents.

ANNUAL CHARGES ON EACH DOLLAR OF COST OF TIMBERS IN PLACE

Interest Rate Per cent	Life in years before replacement																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28	30
4	1.04	0.530	0.362	0.275	0.225	0.191	0.166	0.148	0.132	0.123	0.114	0.106	0.100	0.094	0.086	0.079	0.073	0.069	0.065	0.062	0.060	0.058
5	1.05	0.538	0.367	0.282	0.231	0.197	0.173	0.155	0.140	0.129	0.120	0.112	0.106	0.101	0.092	0.085	0.080	0.076	0.072	0.069	0.067	0.065
6	1.06	0.545	0.374	0.28	0.237	0.203	0.179	0.161	0.148	0.135	0.126	0.119	0.112	0.107	0.098	0.092	0.087	0.083	0.079	0.076	0.074	0.070
7	1.07	0.553	0.381	0.29	0.243	0.209	0.185	0.167	0.153	0.142	0.133	0.128	0.121	0.116	0.109	0.103	0.097	0.092	0.088	0.086	0.083	0.081
8	1.08	0.561	0.388	0.302	0.250	0.216	0.192	0.174	0.160	0.149	0.140	0.133	0.127	0.121	0.113	0.107	0.102	0.098	0.095	0.093	0.090	0.089
9	1.09	0.568	0.395	0.309	0.257	0.223	0.199	0.181	0.167	0.156	0.147	0.140	0.134	0.128	0.120	0.114	0.110	0.106	0.103	0.101	0.099	0.097
10	1.10	0.576	0.402	0.315	0.263	0.227	0.205	0.187	0.173	0.162	0.153	0.146	0.140	0.135	0.128	0.121	0.117	0.114	0.110	0.109	0.106	0.106

Based on the formula, $A = \frac{P(1+r)^n r}{(1+r)^n - 1}$, in which A = annual charge.
P = amount of initial investment.
n = number of years in the recurring period (the average life of the timber).
r = the rate of interest expressed decimally.

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Letters to the Editors

Arc Welding to Rail Webs

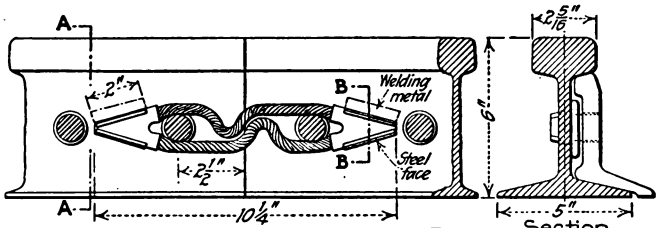
PUBLIC SERVICE RAILWAY

NEWARK, N. J., April 19, 1922.

To the Editors:

In the *Engineering News-Record* of March 30, page 524, appeared an article describing the effect on some 6-in. tee-rails of applying rail bonds to the rail web by means of the electric arc, as determined by a series of tests made by the Pittsburgh Testing Laboratory for the Canadian Engineering Agency, Inc., New York.

The tests were made under the standard drop-test machine specifications of the American Railway Engineering Association, 2,000-lb. weight with 15-ft. fall, some of the rails having bonds applied to their webs and others without the bonds. The bonded rails all



EXPERIMENTAL JOINT FOR USE IN TESTS TO DETERMINE EFFECT OF WELDING ON STRENGTH OF JOINT

broke on the first blow while the unbonded rails required from three to five blows before fracture occurred. In a second series of tests wherein the height of the drop was reduced to 10 ft., the bonded rails all broke on the first or second blow, whereas the unbonded rails required from four to five blows before failure occurred.

While the article did not state the type of electric arc used, whether carbon or metallic electrode was employed, the results obtained are nothing more than could reasonably have been expected. While no definite conclusions can be drawn as to the results which would have been obtained under actual service conditions, it is quite generally conceded that the web of a rail is not the best place in which to install a welded bond. The metal has quite a thin section at this portion of the rail and is that portion in which a considerable part of the internal stress due to unequal rate of cooling during rolling has developed. The intense heat of the electric arc, especially in the case of the carbon electrode or the resistance type of welders, would naturally affect the web more, because the heat is not conducted away from the weld and distributed through a large mass of metal as would be the case if the weld had been made on the head or base of the rail. Welding of plates to rail webs by such methods as that employed in making the Lorain bar weld has a materially different effect, because the temperature rise at the weld is accomplished much more gradually and the effect is not localized to the same extent as in the case of the arc weld, where the metal is suddenly changed from a solid to a molten state and suddenly solidified again. This sudden change would certainly increase brittleness of the steel at the point of weld and would cause the results the test produced.

HOWARD H. GEORGE,
Engineer of Maintenance of Way.

EDITORS' NOTE—The article in the *Engineering News-Record* to which Mr. George refers was entitled "Steel Rails Embrittled by Welding Bonds." It describes tests which were made in connection with the development of a theft-proof rail bond for the Mexico City street railway system. The bond was of the form shown in the accompanying illustration, comprising two strands of No. 0 copper cable connected at the end by spear-shaped cast-copper terminals faced along the outer edge with ⅛ in. of steel. The bond was designed to fit under the standard splice bar, passing around the bolt, and was to be attached to the rail web by means of electric arc welding of the steel facing to the rail metal.

Bonds were attached to about half the number of test pieces, in some cases with one of the terminals at mid-length of the specimen, in other cases with the two terminals symmetrically placed with respect to the mid-length of the rail. No more welding material was used than would be considered good practice, the test report states, and the welding process did not heat the rail to a noticeable degree.

In addition to the information which is quoted by Mr. George, the report states that quite abnormal shapes of fracture resulted in the case of the bonded specimens.

It was concluded from these tests that "serious injury is done to a rail by the welding process applied to its web," and the welded bonds therefore were not adopted for use. A form of bond passing under the splice and then attached to the head or base of the rail by welding may be adopted, however, as welding to the more massive parts of the section is not believed to injure the rail.

"The 'Ruthless' Trackless Trolley. It Is Destroying the Roads."

NEW YORK CITY, April 22, 1922.

To the Editors:

The above is a newspaper headline to an article on the effect of the trackless trolley on the cost of highway maintenance in the Borough of Richmond (Staten Island), where the city of New York is operating a trackless trolley system. This system was described in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 15, 1921. It appears that the authorities in charge of the maintenance of the highways have petitioned the Board of Estimate for $281,600 for repaving two streets whose maintenance has become necessary because of the damage caused by the trackless trolley. The Borough President, in his request for funds for repairs, says: "As the present pavement is being destroyed by the trackless trolley operated by the city," etc. It further appears that 5,600,032 nickels will be needed to pay for the pavement.

The city is finding out that there is some virtue in trolley tracks with pavement maintained by the railways through the aid of the fare payers, thus again proving that the car rider is being taxed for pavement maintenance. Meanwhile, the Richmond authorities are attempting to have the pavement repaired at the expense of the Greater City at large in order to relieve the local taxpayers and property owners fronting on the streets to be repaved. Thus the entire city is asked to subsidize a supposedly cheap form of transportation which is not so cheap when road damage is considered, especially where the trackless trolley fare does not amortize maintenance costs.

This should serve as a warning to those railway companies which may be considering the trackless trolley

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or even the motor bus to beware of any new entangling alliances with franchises which may require pavement maintenance. It also indicates the timeliness of the American Association's recently expressed desire for information on the cost of construction and maintenance of the public highways.

The writer considers that the situation found in Richmond Borough practically confirms some of the statements made in his letter to you dated Jan. 31, 1921, which appeared in the issue of the JOURNAL for Feb. 5, 1921. It was there noted that it will be necessary to build good roads for trackless trolleys, and that good roads cost about as much as good tracks. The experiment in Richmond Borough seems to prove also that it costs a lot of money to maintain roads for bus operation. What would happen to the streets in New York if their operation were to be multiplied many hundred-fold as desired by the Hylan bus or bus transit policy?

"ENGINEER."

*Psychological Tests Must Be Based on Facts**

NEW YORK, N. Y., April 20, 1922.

To the Editors:

The steps being taken by the American Electric Railway Transportation & Traffic Association, through its committee on personnel and training, to apply scientific methods in the selection and development of trainmen have been of great interest to me. It is especially gratifying to see the clear conception, on the part of the committee, of the value of utilizing in the solution of this important problem the accumulated scientific knowledge in the field of selection. The benefits to be derived from improving the personnel of platform men have been set forth in the reports of the committee and in the article by Dr. John Leeming in the March 11 issue of the ELECTRIC RAILWAY JOURNAL. Certainly no one will fail to see the practical results and actual savings in dollars and cents to be obtained through increased good will, the cutting down of operating costs and the reduction of accident claims, made possible by the adoption of sound principles of dealing with human relations. On the one item of the reduction of accident claims alone a large annual saving can be made.

The committee has made definite recommendations that psychological tests be used in the employment procedure and expects, I understand, to suggest concrete tests for use of the membership. It seems especially fitting at this juncture in the program, before definite tests or methods are tried out or adopted, for the JOURNAL through its columns to discuss the procedure which should be followed in order to avoid unnecessary pitfalls and obtain sound and permanent results.

While the use of tests is closely interwoven with the employment procedure and cannot be separated from it, my remarks will largely be confined to the requirements in the preparation and adoption of a testing program. To those who have been directly interested in the development and application of psychological tests to industry, it has been proved over and over again that getting the right start and adhering to a definite technique is of paramount importance. Probably the best thing I can do at this time is to point out just what a psychological test is, and second, to indicate the steps necessary in their preparation and application.

*The author of this letter has been engaged for years in the subject of practical psychology as applied to the personnel in different branches of industry.

What is a psychological test? To one it means a so-called character analysis; to another it means a series of information questions, similar to the "famous" Edison questionnaire; and to yet another it is simply a sort of examination or interview. This general misconception, coupled with the widespread exploitation on the part of the charlatan, is a matter of deep concern to the true psychologist. The long-headed business man, who would not think of turning over a technical piece of engineering to any but a trained engineer, or of turning over his books for an audit by any but a trained accountant, will in many cases, when it comes to applying tests, listen to almost any scheme put up to him. There seem to be two reasons for this attitude: First, each one of us is vitally interested in the human problem involved; second, the tests themselves seem to be quite simple, which causes a tendency to feel that they are easily prepared.

Just what a test is must be clearly understood. A psychological test is not an exercise, nor a problem *per se*, but a standardized task or series of tasks used as an instrument or tool to measure a particular trait or ability. The performance of the task is simply a means of taking a "sampling" of the ability, and is not a complete measure of it. In this manner, an opportunity for expression of the trait is given, and on the basis of this "sampling" it is possible to predict or estimate the total ability. The reliability of the test depends largely upon the task selected making a fair sampling. The principle is the same as that involved in testing steel, in testing chemicals, or in any kind of scientific test. In each case an analysis is made and what is to be tested for determined. Then standards are set up and samplings taken, and on the basis of what the samplings show an estimate of the whole is made.

Obviously, then, psychological tests for use in selecting men for definite types of work cannot be prepared by simply taking tests which have been used for an entirely different purpose or a different type of job. This error is probably the most common one made by the uninitiated. It is possible to get together a good collection of tests; but a test in itself means nothing. It is the interpretation which gives results, and in order to get the proper interpretation a definite procedure and technique must be followed in the preparation. The results of a good test may be entirely vitiated by preconceived ideas which lead to erroneous conclusions. One of the most common mistakes made is the assumption that the most intelligent man will be the best for a particular type of work. It has been conclusively proved that there is a range of intelligence which is best for each type of work; that there is an upper limit as well as a lower limit which should be adhered to if all the factors entering into efficiency and contentment are to be recognized. This principle is closely related to the problem of training and promotion, and in practice affects the policies and organization of each company. If opportunities for promotion are present, a higher type of ability may be secured and the range made wider than if the selection is made with the intention of keeping the man on the one job.

Experience has shown that the steps to be followed in preparing tests are: (1) A careful analysis of the job for which the tests are to be used, to determine the essential human qualities involved in efficient performance. (2) The preparation of tests for these qualities, tests which are simple and easily administered. (3) The standardization of the tests through tryout on men of

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known ability. (4) Revision of the tests in light of the findings, and setting up of standards for use in the selection of new men.

Applying this procedure to the problem before the association, what does it mean? In the first place, there are no tests in existence, other than some mechanical devices such as are described in Dr. Gradenwitz's article in the JOURNAL of Jan. 28, which are directly applicable in the selection of motormen and conductors. It will be necessary, therefore, that a series of tests for this purpose be prepared. The first thing to do will be to make a careful and complete job analysis. Sitting in an armchair and guessing at the qualities involved will not be sufficient, even though one feels that he is familiar with the job. Until a systematic study is made of the duties of trainmen, there is very little basis upon which to proceed. At best, there will of necessity be a great many changes before the exact qualities will be found. When the qualities have been determined, practical tests may be devised. As a result of experience in the army and in industry during the last few years, great progress has been made in simplifying tests and methods of giving them. This experience should be drawn on by the association, for success largely depends upon the practicability of the tests themselves. In carrying out the third step, that of standardization of the tests, a representative group of at least five hundred men of known ability should be selected, preferably from a number of different companies, and the tests given to them, the results being checked against their efficiency on the job. A test is not ready for use until it has undergone such a tryout. Even then, only tentative standards will have been set. Before adequate standards can be determined, a great many revisions of the tests will in all probability have to be made, based on experiences in different companies as indicated by careful records. Standardization will be greatly facilitated in the program of the association by the comparisons which can readily be made, because the almost identical nature of the work in the different companies will permit the same tests to be used and standard procedure to be followed. Unless provision is made in the program of the association for keeping records of the results obtained in the various companies, adequate standardization will never be possible.

In my estimation, and I want to emphasize this in conclusion, it is better not to start the use of tests at all than to "get off on the wrong foot" by attempting to do in a hurry what requires time and patience as well as expert counsel to do. Testing is not something mysterious; but the utilization of the knowledge already obtained in the field is essential if results are to be permanent and satisfactory. N. L. HOOPINGARNER.

Single and Double-Door Safety Cars

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

TORONTO, ONT., March 15, 1922.

To the Editors:

We have followed the various communications that have appeared in your journal on the above subject with very great interest, and after careful study have reached the same conclusions as expressed by Mr. Flowers in his letter of March 6, appearing in your issue of March 11.

About three months ago we placed an order with a local car company for twenty-five cars of the safety type and specified our own design rather than the standard, as we are absolutely convinced that satisfactory service cannot be given with the narrow aisles and single doors provided on the so-called standard car. The double doors on our car will be separately operated, and we have also deviated from the old standard by increasing the motor capacity to two 40-hp. motors.

We are thoroughly convinced that the wide aisles and separate entrances must be provided before a satisfactory car of this type can be produced.

FREDERICK A. GABY,
Chief Engineer.

One of the Busiest Traffic Streets in the World

THIS VIEW SHOWS THE FOUR LINES OF CARS ON LOWER MARKET STREET, SAN FRANCISCO. THE SPECTATOR IS LOOKING SOUTHWEST ON MARKET STREET FROM FRONT STREET

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Lower Court Is Upheld in Galveston Fare Case

United States Supreme Court Indicates Galveston Company May Reappeal to City for Relief from Five-Cent Fare Order Under Changed Economic Status if Court's Prophecy Has Proved Wrong

Action of the City Commission of Galveston, Tex., in fixing 5 cents as the fare to be charged there has been upheld by the United States Supreme Court. This marks an end to fare litigation that has been waged for several years. The opinion, delivered by Justice Brandeis, sustained the action of the United States District Court at Houston in dismissing without prejudice the application for an injunction on the part of the Galveston Electric Company.

The Opinion of the Court

THE street railway system of Galveston was started as a horse-car line in 1881. It was electrified about 1890 and after the hurricane of 1900 was largely rebuilt. Upon sale on foreclosure the railway passed in 1901 to a new company, and in 1905 it was purchased by the Galveston Electric Company, which supplies to the inhabitants of that city also electric light and power. At no time has the full fare on the railway been more than 5 cents—except during the period of eight months, from Oct. 1, 1918, to June 5, 1919, when 6 cents was charged. This higher fare was authorized by ordinance of the municipal Board of Commissioners, which possesses regulatory powers, and on June 5, 1919, the same board reduced the maximum fare to 5 cents. The latter ordinance was passed after a hearing and a finding by the board that with the reduced rate the company would continue to earn a fair return. Under the 1919 ordinance the company operated for eleven months. Then it brought this suit, in the federal court for southern Texas, to enjoin its enforcement. The company contends that the fare prescribed is confiscatory in violation of the Fourteenth Amendment; the city that it is sufficient to yield a return of 8 per cent on the value of the property used in the public service.

A temporary injunction having been denied, the court appointed a master to take the evidence and make advisory findings. There was substantially no dispute concerning the facts past or present. It was assumed, in view of then prevailing money rates, that 8 per cent was a fair return upon money invested in the business. The experts agreed on what they called the estimated undepreciated cost of production on the historical basis; that is, what the property ought to have cost on the basis of prices prevailing at the time the system and its various units were constructed. They agreed also on the amount of gross revenue, and on the expenditures made in operation and for taxes, except as hereinafter stated. The differences between the parties resulted, mainly, either from differences in prophecy as to the future trend of prices or from differences in legal opinion as to the elements to be considered in determining whether a fair return would be earned. These differences affected both the base value and the amount to be deemed net revenues. The master, who heard the case in October, 1920, and filed his report in November, made findings on which he advised that the fare was confiscatory. The District Judge, who heard the case in January, 1921, found a much smaller base value and much larger net revenues, stated that he did not deem it necessary to determine whether the ordinance "will produce exactly 8 per cent or a little more or a little short of it," declared that he was "not satisfied that the ordinance produces a return so plainly inadequate as to justify this court in interfering with the action of the municipality in the exercise of its rate-making function" and in March, 1921, entered a decree dismissing the bill without prejudice. In April he denied a petition for rehearing, 272 Fed. 147. The case comes here on appeal under Sec. 238 of the Judicial Code.

The undepreciated reproduction cost on the historical basis[1]—which seems to be substantially equivalent to what is often termed the prudent investment[2]—was agreed to be $1,715,825. The parties failed to agree in their estimates of the depreciation accrued up to 1921. The master estimated that, based on the 1913 price level, it was $390,000, and this estimate the court accepted. Thus measured, the value of the property, less depreciation, was $1,325,825. The court found that the net earnings under the 5-cent fare for the year ended June 30, 1920, had been $90,159 and for the year ended Dec. 31, 1920, $109,286, and estimated that for the year ended June 30, 1921, it would be at least $111,285. The return so found for the year ended June 30, 1920, is 6.8 per cent of $1,325,825; for the calendar year 1920, 8.2 per cent and for the year ended June 30, 1921, 8.4 per cent. The master made calculations only for the year ended June 30, 1920, and, mainly[3] because he allowed an amount for maintenance and depreciation equal to nearly 18 per cent of the prudent investment for the depreciable property (less accrued depreciation), found the net earnings to be only $50,249.60. This sum is 3.8 per cent on the prudent investment value, less depreciation. But neither the District Judge nor the master reached his conclusion as to net return by a calculation as simple as that indicated above.

Determination of Value

First—As the base value of the property, master and court took—instead of the prudent investment value—the estimated cost of reproduction at a later time, less depreciation; and in estimating reproduction cost both refused to use as a basis the prices actually prevailing at the time of the hearings. These had risen to 110 per cent above those of 1913. The basis for calculating reproduction cost adopted by all was prophecy as to the future general price level of commodities, labor and money. This predicted level, which they assumed would be stable for an indefinite period, they called the new plateau of prices. As to the height of this prophesied plateau there was naturally wide divergence of opinion. The company's expert prophesied that the level would be 60 to 70 per cent above 1913 prices; the master that an increase of 33⅓ per cent would prove fair, and the court accepted the master's prophecy of 33⅓ per cent.[4] Thus both master and court assumed a reproduction cost, after deducting accrued depreciation, of about $1,625,000. On this sum the net earnings found by the court yielded—after deducting a 4 per cent depreciation annuity on property subject to depreciation, a maintenance charge, and a charge for taxes, other than the federal income tax—a net return of 5½ per cent for the fiscal year ended June 30, 1920; of 6.7 per cent for the calendar year 1920, and the promise of more for the fiscal year ended June

[1] That is "the estimated undepreciated cost of reproduction of railway property of the company on the historical basis, exclusive of franchise value, going concern value, bond discount and brokerage fee," but with land and right of way which cost about $15,000 estimated at their present value of $58,836. It was also agreed, for the purpose of dividing joint items, that one-fifth of the property of the company was devoted to its light and power business.

[2] See Richberg, 31 Yale Law Journal, 263, 266, 279; Hale, 30 Yale Law Journal, 710, 720; Henderson, 33 Harvard Law Review, 902 and 1031; Friday, 36 Quarterly Journal of Economics, 197, 211.

[3] He allowed also on account of federal income taxes a sum of $8,008, which the court disallowed.

[4] From the agreed valuation of $1,715,825, the court deducted $425,117 for property not subject to this appreciation—land, already given its market value, and capital acquired recently (all acquisitions before Jan. 1, 1915, being assumed to have been at the 1913 price level, all since that date at the new level). The balance was appreciated ⅓; the $425,117 was added again; and accrued depreciation, likewise appreciated ⅓, was subtracted. The court thus obtained a base value of $1,626,061. The master's figure was slightly smaller (but for his inclusion of development cost and brokerage) for he excepted more property from this 33⅓ per cent appreciation.

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30, 1921. But to fix base value the master added, and the court disallowed, items aggregating nearly $600,000, which must now be considered.

The most important of these items is $520,000 for "development cost." The item is called by the master also "going concern value or value of plant in successful operation." He could not have meant by this to cover the cost of establishing the system as a physically going concern, for the cost of converting the inert railway plant into an operating system is covered in the agreed historical value by items aggregating $202,000. These included, besides engineering, supervision, interest, taxes, law expenses, injuries and damages during construction, the sum of $73,281 for the expenses of organization and business management. The going concern value for which the master makes allowance is the cost of developing the operating railway system into a financially successful concern. The only evidence offered, or relied upon, to support his finding is a capitalization of the net balance of alleged past deficits in accordance with what was said to be the Wisconsin Rule.[5] The experts calculated this sum in various ways. One estimate placed the development cost at $2,000,000; a more moderate estimate by the company's expert was $575,300, and the city's expert made a calculation by which he estimated this so-called cost at $212,452.

Interpretation of "Development Cost"

If the rule were that a prescribed rate is to be held confiscatory in case net earnings are not sufficient to yield 8 per cent on the amount prudently invested in the business, there might be propriety in counting as part of the investment such amount, if any, as was necessarily expended at the start in overcoming initial difficulties incident to operation and in securing patronage. But no evidence of any such expenditure was introduced; and the claim of the company does not proceed upon that basis. What was presented by the witnesses are studies, on various theories, of what past deficiencies in net income would aggregate, if 4 per cent were allowed as a depreciation annually on the value of the property used. These calculations covered, on one basis, the period of thirty-nine years since the original horse-car line was built; on another, the period of fifteen years since the appellant purchased the property as a going concern. If net deficits so estimated were made a factor in the rate base, recognition of 8 per cent as a fair return on the continuing investment would imply substantially a guarantee by the community that the investor will net on his investment ultimately a return of 8 per cent yearly, with interest compounded on deferred payments; provided only that the traffic will in course of time bear a rate high enough to produce that amount.[6]

The fact that a utility may reach financial success only in time or not at all is a reason for allowing a liberal return on the money invested in the enterprise, but it does not make past losses an element to be considered in deciding what the base value is and whether the rate is confiscatory. A company which has failed to secure from year to year sufficient earnings to keep the investment unimpaired and to pay a fair return, whether its failure was the result of imprudence in engaging in the enterprise, or of errors in management, or of omission to exact proper prices for its output, cannot erect out of past deficits a legal basis for holding confiscatory for the future rates which would, on the basis of present reproduction value, otherwise be compensatory. Knoxville vs. Knoxville Water Company, 212 U. S. 1, 14.

Nor is there evidence in the record to justify the master's finding that a business brought to successful operation "should have a going concern value at least equal to one-third of its physical properties." Past losses obviously do not tend to prove present values. The fact that a sometime losing business becomes profitable eventually through growth of the community or more efficient management, tends to prove merely that the adventure was not wholly misconceived. It is doubtless true, as the master indicated, that a prospective purchaser of the Galveston system would be willing to pay more for it with a record of annual losses overcome than he would if the losses had continued. But would not the property be, at least, as valuable if the past had presented a record of continuous successes? And shall the base value be deemed less in law if there was no development cost, because success was instant and continuous? Or, if the success had been so great that, besides paying an annual return at the rate of 8 per cent, a large surplus had been accumulated, could the city insist that the base value be reduced by the amount of the surplus? Compare Newton vs. Consolidated Gas Company, decided March 6, 1922.

In determining the value of a business as between buyer and seller, the good will and earning power due to effective organization are often more important elements than tangible property. Where the public acquires the business, compensation must be made for these, at least under some circumstances. Omaha vs. Omaha Water Company, 218 U. S. 180, 202, 203; National Waterworks Company vs. Kansas City,, 62 Fed. 853, 865. And they, like past losses, should be considered in determining whether a rate charged by a public utility is reasonable. Compare Venner vs. Urbana Waterworks, 174 Fed. 348,352. But in determining whether a rate is confiscatory, good will and franchise value were excluded from the base value in Cedar Rapids Gas Company vs. Cedar Rapids, 223 U. S. 655, 669, and Des Moines Gas Company vs. Des Moines, 238 U. S. 153, 169; and the expressions in Denver vs. Denver Union Water Company, 246 U. S. 178, 184, 191, and in Lincoln Gas Company, vs. Lincoln, 250 U. S. 256, 267, are not to be taken as modifying in any respect the rule there declared. Going concern value and development cost, in the sense in which the master used these terms, are not to be included in the base value for the purpose of determining whether a rate is confiscatory.

Hypothetical Brokerage Fees Disallowed

The other item included by the master in determining base value, but disallowed by the court, is $67,078 for brokerage fees. There is no evidence that any sum was in fact paid as brokerage, and there was included, as above shown, the sum of $73,281 for organization and business management in calculating the historical reproduction cost. The finding of the master rests upon testimony that bankers customarily get, in some form, compensation equal to 4 per cent on the money procured by them for such enterprises.[7] But compensation for bankers' services is often paid in the lessened price at which they take the company's securities, and is thus represented in the higher rate of interest or dividend paid on the money actually received by the company as capital. The reason given by the master for including the allowance for an assumed brokerage fee is that a brokerage fee is "a normal incident of large industrial investments and has not been amortized," since "the record shows that the plant has been operated at a loss." If base value were to be fixed by the money expended, brokerage fees actually paid might with propriety be included, as are taxes paid pending construction. But as the base value considered is the present value, that value must be measured by money; and the customary cost of obtaining the money is immaterial. We cannot say that the court erred in refusing to include in base value an allowance for hypothetical broker's fees.

The appellants insisted also that the base value should be raised by assuming that the future plateau of prices would be 60 to 70 per cent above the historical reproduction value instead of 33⅓ per cent as the master and the court assumed. The appellees insisted, on the other hand, that an item of $142,281 for

[5] Hill vs. Antigo Water Company, 3 Wis. R. R. Com. Reports, 623, 705-723. But see Cunningham vs. Chippewa Falls Water Company, 5 Wis. R. R. Com. Reports, 302, 315; Appleton vs. Appleton Water Works Company, 5 Wis. R. R. Com. Reports, 215, 277; In re Purchase Racine Water Works Plant, 19 Wis. R. R. Com. Reports, 83. 140.

[6] On the other hand, if what is to be considered in determining the net deficit is not the result of operations from the beginning of the enterprise, but the result of operations since the present owner acquired it—in other words, the return on its investment—we are left without the data necessary to determine the fact. For the record does not disclose what the present company paid when it purchased the property in 1905 as a going concern. For aught that appears, appellant has received full 8 per cent annually on that amount and later additions to capital.

[7] The record cost of the property was originally used as the base for this calculation. But the figure $67,076 was tacitly agreed by both parties to be the amount, if any, that should be allowed for brokerage.

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grade raising included by master and court in the historical cost should be eliminated. We cannot say there was error in over-ruling these contentions.

DEPRECIATION, MAINTENANCE, TAXES

Second—Concerning deductions to be made from gross revenue in order to determine net earnings, the court differed from the master in regard both to the yearly charge for maintenance and to the depreciation annuity. It appeared that in the fifteen years since appellant acquired the system in 1905, the average annual expenditure for maintenance had been $42,771; that during the war the property had been admittedly undermaintained; that the expenditure was $64,108 in the calendar year 1919; $80,322 in the fiscal year ended June 30, 1920, and $90,861.28 in the calendar year 1920. The court estimated the proper charge for current maintenance at $70,000, and allowed, in addition, a depreciation annuity of $45,245 (that is, 4 per cent on property subject to depreciation) to provide a fund out of which annual replacements and renewals could be made. Thus the court allowed for the year's depreciation and maintenance $115,245, which is nearly 14 per cent of the historical reproduction value, and about 10 per cent of the assumed reproduction cost, of the depreciable part of the system. The master allowed $147,146.40 for maintenance and depreciation during the year ended June 30, 1920. This larger figure was arrived at, partly by charging as cost of maintenance the full $80,322 expended during that year, and partly by including as depreciable property expenditures for overhead items which the court excluded. The proper annual charge for maintenance is the amount normally required for that purpose during the period; it is not necessarily the amount actually expended within the year. Many items included in the overhead cost of original construction may properly be excluded in calculating the amount of the depreciation annuity. We cannot say that the court erred in limiting the year's maintenance and depreciation allowances to $115,245.

The company asked to have allowed as a further charge $29,500 a year on account of what it called deferred maintenance. The contention is that during the war and two years following, the company had deferred maintenance, pursuant to a policy established at the express request of the Government to the end that material and labor might be released for war purposes; that to make good this deferred maintenance would cost $197,000, and that in order to amortize this amount an annual allowance from earnings of $29,500 should be made for five years. This is an attempt, in another form, to capitalize alleged past losses, and the request was properly refused.

Third—The remaining item as to which the master and the court differed relates to the income tax. The company assigns as error that the master allowed, but the court disallowed, as a part of the operating expenses for the year ended June 30, 1920, the sum of $16,254 paid by the company during that year for federal income taxes. The tax referred to is presumably that imposed by the act of Feb. 24, 1919, c. 18, Secs. 230-238, 40 Stat. 1057, 1075-1080, which for any year after 1918 is 10 per cent of the net income. In calculating whether the 5-cent fare will yield a proper return, it is necessary to deduct from gross revenue the expenses and charges, and all taxes which would be payable if a fair return were earned are appropriate deductions. There is no difference in this respect between state and federal taxes or between income taxes and others. But the fact that it is the federal corporate income tax for which deduction is made must be taken into consideration in determining what rate of return shall be deemed fair. For under Section 216 the stockholder does not include in the income on which the normal federal tax is payable dividends received from the corporation. This tax exemption is therefore, in effect, part of the return on the investment[8].

1922 EARNINGS MAY BE 8 PER CENT

It is thus clear that both in the year ended June 30, 1920, and in the calendar year 1920 the net earnings of the system were less than 8 per cent of its value, whether the value be estimated on the basis of prudent investment or on the basis of the reproduction cost actually adopted. When the court rendered its decision the ordinance had been tested for more than a year and a half—a period ample in ordinary times to test the current effect of the rate prescribed and to indicate its probable effect in the near future. The times here involved were, however, in a high degree abnormal. It did not follow that, because the system had earned less than 8 per cent in 1919 and in 1920, it would earn less than 8 per cent in 1921. A rate ordinance invalid when adopted may later become valid, just as an ordinance valid when made may become invalid by change in conditions. Municipal Gas Company vs. Commission, 225 N. Y. 89, 96. Compare Willcox vs. Consolidated Gas Company, 212 U. S. 19; Newton vs. Consolidated Gas Company, decided March 6, 1922.

The District Judge was obliged to form an opinion as to the probable net earnings in the future. All relevant facts, except as stated, and all applicable arguments were fully and clearly presented by the parties and were carefully considered by the court. Although the District Judge treated the master's report as advisory merely, he passed upon the numerous exceptions taken to the master's findings in order to indicate his view on the precise points raised. He allowed some exceptions and disallowed others. Upon petition for rehearing further careful consideration was given to the case. Views expressed in the first opinion on some matters were modified; but these changes did not call for any change in the decree. The District Judge had before him some evidence not before the master; for the company's expert was recalled and testified both to the result of operations of later months in which there was a large increase in travel and to the heavy decline in prices which occurred after October. Concerning actual facts there was substantially no controversy. On the elements to be considered in determining whether the rate would be confiscatory no error was made which could substantially affect the result. His determination whether the prescribed rate would be confiscatory was necessarily based largely on a prophecy, for normal conditions had not been restored. He found that gross revenues were steadily increasing; and that they were larger under the 5-cent fare than they had been during the preceding year when the 6-cent rate was in effect. He was convinced that operating costs would decrease largely during the year. His two opinions show that every element upon which his prophecy should be based received careful consideration. We cannot say that the evidence compelled a conviction that the rate would prove inadequate. Compare San Diego Land & Town Company vs. National City, 174 U. S. 739, 754. San Diego Land & Town Company vs. Jasper, 189 U. S. 439; Knoxville vs. Knoxville Water Company, 212 U. S. 1, 17.

The occasion for the suit was solely the extraordinary rise in prices incident to the war. There was no suggestion that action of the board evidenced hostility to the utility, or that the board was arbitrary or hasty. It had been theretofore considerate of the company's rights and needs. When prices rose rapidly in 1918, it raised the fare limit to 6 cents, although the franchise ordinance prescribed the 5-cent fare. And this was before our decision in San Antonio vs. San Antonio Public Service Company, 255 U. S. 547. Its reduction of the fare by ordinance of June 5, 1919, was made after hearing, and was doubtless due to the conviction, shared by many, that, with the cessation of hostilities and the negotiation of the peace treaty, prices and operating cost would fall abruptly. This prophecy, if such there was, proved false. But nearly three years have elapsed since the board adopted the ordinance; and more than a year since entry of the decree below. We know judicially that the period has, in general, been one of continuous price recession, and that the current rates of

[8] It is difficult to see how, on the facts presented, so large a sum as $16,254 could have been paid on account of the year's operation. Indeed the court, in disallowing the item of federal income tax, deducted not $16,254, but $8,008. Even this seems too large, for the net earnings, without deduction of the $16,254 attributed to income tax, for the year ended June 30, 1920, as found by the master, were $66,503.60. From this, interest paid or accrued on indebtedness is to be deducted before computing the net income on which the tax is payable. A large part of the capital of utility companies is ordinarily represented by interest-bearing bonds and notes, and there is evidence that such indebtedness of the appellant was "in the neighborhood of $1,400,000." The interest on this debt chargeable to the railway system would be at least $50,000. There is further an exemption from tax of $2,000 of the net income. So a 10 per cent tax on the balance would amount to less than $1,500.

In the record and briefs elsewhere the income tax is reckoned at between $8,000 and $10,000, which is a proper figure if there be an 8 per cent return on $1,626,061.

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return on capital are much lower than they then were*. But we cannot know to what extent the important changes occurring have affected either gross revenues or the net return. There is no reason to believe that the board would not give full and fair consideration to a proposed change in rate if application were now made to it. And the District Judge stated in his opinion (272 Fed. 147) that the decree to be entered would be vacated or amended in case it should later appear that the regulating board declined such adjustment of rates as the actual experience of the utility might show it entitled to; and the decree was thereupon entered without prejudice.

The District Judge refused a temporary injunction and did not exact a bond. Hence the only relief we can grant is such as operates *in futuro*. Compare Duplex Printing Press Company vs. Deering, 254 U. S. 443, 464. An injunction should not issue now, unless conditions are such that the prescribed rate is confiscatory. As by the reservation in the decree appellant may secure protection against the ordinance if under existing conditions the 5-cent rate appears to be inadequate, the decree should be affirmed. Compare Lincoln Gas & Electric Company vs. Lincoln, 250 U. S. 256, 268; 257 U. S.

Action by Galveston Company

In anticipation of a decision that would not restore the 6-cent fare but would authorize the company to seek relief through application to the constituted authorities, the Galveston Electric Company has made application to the City Commission for authority to increase its fares to 6 cents. In this connection the company petitioned the City Commission to order an audit of its books to the end that the real conditions in regard to profits or losses of the company might be determined. The City Commission granted this petition and at a meeting just two days before the Supreme Court decided the fare case directed that the books of the Galveston Electric Company be audited.

In discussing the petition for an audit, City Attorney Frank S. Anderson told the commission that without an audit of the traction company's books which would show whether the figures presented by the company were correct, it would be impossible to determine if the profits under a 5-cent fare were inadequate.

On being advised of the decision by the Supreme Court, R. G. Carroll, general manager of the Galveston Electric Company, said:

> When the district federal court rendered its decision it found that the return, as reflected by the records, was undoubtedly less than the law regards as fair.
>
> The court, however, felt that the future earnings of the company would be sufficient to permit the company to earn a fair return, and issued its injunction as follows:
>
> "The injunction prayed for will be denied upon a decree so drawn as to permit the complainant to again apply as it may be advised, should the actual experience of the future prove the prophecy false."
>
> Unfortunately, the earnings of the company have declined, rather than increased, so that the present moment finds the company in a strained financial position and not earning a return that the law regards as fair.
>
> In view of the above conditions, the company has presented its condition to the city commission of Galveston for further consideration.

William E. Tucker, Boston, Mass., who represented Stone & Webster in the trial of the case just decided, expressed the opinion that the most significant thing about the court's decision is the "indirect reaffirmation by the Supreme Court of the United States of the now well-established principle that in Texas a 5-cent fare provision written into a franchise is not a contract between a city and a railway system, but is in fact no more than the exercise of the rate-making power of the city, and as such is subject to the provision against confiscation contained in the Fourteenth Amendment to the Constitution."

Mr. Tucker explains that the new appeal of the company for relief is based on the ground that under the present operative conditions a fair return on its property is not being earned. He says that while the Supreme Court held that the District Court did not err in its early conclusion, the prophecy of the court in that case with respect to the probable future earnings of the company was wrong, and that the right adheres to the company under the existing circumstances to seek relief either from the City Commission or the District Court.

*See Federal Reserve Bulletin, January, 1922, pages 5, 79, 113; February, 1922, pages, 156-157.

All-Electric Power Signaling on London Metropolitan Railway

Progressive British Road Has Adopted Signal Improvements as These Became Available, and Is Still Experimenting with a View to Utilizing Latest Inventions.

SOME interesting particulars of the all-electric automatic power signaling on the Metropolitan Railway (London) have just been given to the Institution of Civil Engineers by William Willcox, M. A. M. Inst. C. E. In 1905, when electric service was inaugurated on the Metropolitan Railway, the signaling was mechanically controlled by the Spagnoletti lock and block. The number of trains between Praed Street junction and Aldgate, a distance of about 5 miles, was then 621 per day on both roads, and the number of signal sections was forty-nine. As the number of trains was increased, it was found necessary to introduce automatic signaling controlled by track circuits. The system chosen was all-electric, the work was undertaken in 1908 and this section was completed in the following year. Two power frames were installed, one at Praed Street and one at Aldgate, to handle the traffic at these places; but the existing mechanical boxes were retained at the intervening stations for shunting purposes, with the addition of the safeguards provided by track control. The number of trains in 1913 at Praed Street was 863, and from Baker Street to Aldgate 983, with ninety-one signal sections.

There are about twenty hours daily of continuous passenger traffic, but from 7.30 to 10 a. m. and from 4.30 to 7.30 p. m., the traffic is so dense as to necessitate forty trains each to and from the city per hour. The automatic signaling dealt with these satisfactorily. Similar signaling was therefore installed between Baker Street and Neasden in 1911, the number of signaling sections being increased from twenty-four to fifty-one.

At this date there was only one through line at Baker Street handled by two signal boxes, one at the north end of the station and one at the Circle end. This through line was track-circuited, and full protection was afforded to train movements, allowing forty-eight through passenger trains to be run to and from the city. All the current used in these installations was continuous.

In 1913 the new Baker Street station was completed, and automatic signaling was installed between the Circle lines and the north end of the station. For this purpose a small signal box was constructed on a retaining wall so as to be out of the way, and in it a power frame of thirty-six levers (6 spare) was erected. This power frame handles more than 1,500 trains a day, and the signalman has no view of the trains except those within station limits immediately in front of his box. Through the station all signals and points are controlled by direct current, but the track circuits are alternating current.

In 1913, also, two new fast lines were constructed alongside the old or local lines from Finchley Road to Wembley Park, a distance of 5 miles. Through the junction at Finchley Road and on to Wembley Park alternating current track circuits were installed, but the signals are worked by direct current as far as Neasden power house. From this point to Harrow-on-the-Hill alternating current is used for the signals as well as for the tracks, and from the same point alternating current is used for both tracks and signals on the local lines to the junction north of Wembley Park station where the fast and local lines converge. From Baker Street to Harrow-on-the-Hill, before automatic signaling, there were thirty-nine signaling sections. Now there are sixty-nine and on the through fast lines there are twenty sections.

In 1919 the signaling from Praed Street station to South Kensington, which was an automatic bar-and-treadle system controlled by direct current, was

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track circuited with alternating current, but the signals continue to be controlled by direct current.

Current for the supply of power to operate the power frame at Praed Street junction and at Baker Street is obtained from two 130-volt, 5-kw. motor-generators through suitable cables. These supply power for the operation of the points, the signal lamps and train stops, the electromagnets for back-locks and for the constant indication of power-worked points at Praed Street junction, and also for working the power frame at Baker Street, the total required for both boxes being 2.08 kw.

Power Consumption Is Small

For operating the track circuits, automatic and semi-automatic signals and train stops, between Praed Street, Bishop's Road and Edgware Road stations, and also between Edgware Road, Great Portland Street and Marlborough Road, and for four large illuminated train indicators at Baker Street, power is obtained from one 15-kw. and two 12-kw., 70-volt motor-generators in Baker Street substation, and the maximum power taken is 14-kw. The mechanical locking in the power frames is ordinary miniature tappet-locking controlled by levers in the ordinary way, the electric locking frame being behind the levers. Illuminated continuous diagrams are placed behind the frames lighted by 75-volt 5-cp. lamps.

All signals at junctions are electrically back-locked, an important safety device which in the further development of electric signaling has enabled point-locking bars to be dispensed with. At all running-stop signals there are train stops which are not connected to the signals mechanically, but electrically, and are controlled by the track circuits in the same manner as the signals, coming to clear and going to danger with the signal. They are also controlled by the track circuit independently of the signal, so that, if a signal failed to go to danger, the arm of the train stop would still go to the danger position.

All electric signals are either automatic or semi-automatic, the former controlled through the track circuits by the passage of the trains themselves, the latter controlled from a signal box when this is in use, but becoming automatic when not so controlled. Inside tunnels the signals are lamp signals, outside they are upper-quadrant semaphores worked by electric motors. Signals are held normally in the clear position by electric power, going to danger by gravity.

All signals are lighted electrically, and station masters light the signals half-way to the next station on either side, by means of a switch at their station. A hundred yards behind each stop signal in the open, fog repeater signals have been erected, the lights of which are placed at the level of the driver's eyes and as near as possible to the running line. By this means an indication is given to the driver whether the stop signal ahead is at clear or at danger, and if it is at danger he can slow up and avoid being tripped suddenly. The signalmen have fog repeater switches in the signal box by means of which they can light the fog repeater lamps when necessary.

Between junctions it is possible to have a number of trains, *e. g.*, between Finchley Road and Baker Street it is possible to have ten trains. For this reason Mackenzie Holland and Westinghouse train describers were installed, by which the signalman at Finchley Road is enabled to indicate to the Baker Street signalman whether the train terminates there, or is a through train to the city. All points where there are power frames are worked by the Mackenzie Holland and Westinghouse all-electric point machines. These machines are enclosed in a water-tight cast-iron case divided into three compartments. At one end is the motor, in the center are the gear wheels and motor switches, and in the other end is the worm drum that operates the points and the bolt that licks them both ways. Both point blades as well as the bolt lock are individually detected through an electric detector fixed in the 4-ft. way before the signalman can get his signal for a train to pass over that route. These point machines, says Mr. Wilcox, are most successful.

The track relays at Baker Street are of the single element vane type, the shunt by a train averaging 0.9 ohm. The relays used on the direct current system are of the three-coil polarized type, the shunt of which by a train averages 0.15 ohm. The most recent type of relay used is a two-element vane relay, the shunt of which by a train averages 3.4 ohms. The maintenance cost of this type of signaling is not excessive.

Automatic Signaling Cuts Costs

Before automatic signaling was installed there was 645 levers in use, whereas at present only 311 levers are employed, while the number of signalmen was reduced from eighty-six to twenty-seven and one-half. This meant in 1908 a saving of £127 (about $615 at then rate of exchange) per week on signalmen's wages, which at the present rate would be around £325 (about $1,483 at current rate of exchange). During 1920 the whole cost of maintenance—wages and materials—of the signaling of the electrified lines amounted to £123 per route-mile.

Charts have been kept from the beginning of automatic signaling in order to ascertain the number of delays to trains as compared with delays to trains with ordinary signaling, and the comparison works out very favorably for automatic signaling.

Tests have also been made with a three-position light signal as used on the Pennsylvania Railroad. The cost of maintenance is about the same as with two position semaphores, but the light signal appears to possess advantages in some respects, *e. g.*, in the entire absence of mechanical parts, and in the power of penetration of the light rays both in sunshine and in fog.

Power Test Codes to Be Discussed at Public Hearing

ON MAY 9, during the spring meeting of the American Society of Mechanical Engineers at Atlanta, Ga., a public hearing will be held for the discussion of the three additional power test codes which have reached this stage in their development during the past year. Last May at Chicago this committee, of which Fred R. Low, editor of *Power*, is chairman, presented codes on general instructions, steam engines and evaporating apparatus. It now presents codes on definitions and values, displacement compressors and blowers and hydraulic power plants, all three of which have appeared in *Mechanical Engineering*.

Although these codes have passed through six successive revisions in reaching their present form, the committee will welcome a full and frank discussion by the members of the society and others interested in these three subjects. Persons not planning to attend the spring meeting are invited to prepare written discussions.

Reprints of all three codes revised to date have been prepared by the committee and may be obtained by addressing C. B. LePage, secretary to the committee, at the society's headquarters, 29 West Thirty-ninth Street, New York, N. Y.

In 1918 the power test codes committee of the A.S.M.E. was reorganized to revise and enlarge the power test codes of the society, published in 1915. The committee is a large one, consisting of a main committee of twenty-five, under the chairmanship of Mr. Low, and nineteen individual committees of specialists who are drafting codes for the different classes of apparatus comprised in power-plant equipment.

Automotive Engineers Travel in Rail Car

WHAT was heralded as the first trip in history in which a scientific body has traveled any distance on a standard railroad in a motor rail car was made April 21 by New York members of the Society of Automotive Engineers, who traveled to New Haven to hear Prof. E. H. Lockwood of Sheffield Scientific School discuss power losses in motor-vehicle chassis. Some sixty-odd members traveled in the two Mack A.C. rail cars now in operation on the New York, New Haven & Hartford Railroad. Through the courtesy of the New Haven these cars were taken off their regular lines for the trip.

The average operating speed between the Harlem terminal and New Haven was 27 m.p.h., the speed varying according to traffic conditions. For instance, the average speed in the 16.5-mile stretch between New Rochelle and Stamford was only 20.2 m.p.h., whereas in the next stretch, Stamford to South

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Norwalk, one of the cars made 36.4 m.p.h. The maximum speed was about 42 m.p.h., but at the higher speeds there was considerable vibration.

The two rail cars were placed in revenue service on Jan. 30, 1922, one covering an 11-mile route from New Haven to Derby and a 44.8-mile route to New Hartford. The second car runs from Litchfield to Waterbury, a distance of 36.4 miles. So far the two have covered about 23,000 miles in the service of the New York, New Haven & Hartford Railroad. Each car has seats for thirty-six passengers, with a 9 x 6-ft. baggage compartment located at the rear.

Industrial Engineers' Convention

THE Society of Industrial Engineers held its spring convention at Hotel Statler, Detroit, Mich., April 26 to 28. Of interest to electric railway men especially were the papers and discussions on conservation of material, plants and equipment, and labor and the workman.

Chamber of Commerce of the United States

AT THE tenth annual meeting of the Chamber of Commerce of the United States, to be held in Washington May 16 to 18, "European Conditions and Their Effect on American Business" will be the main topic. This announcement was made by the Chamber on April 24, when it made public a tentative program for the meeting. Because of the interest of business men throughout the country in the general subject it is predicted that the convention will be one of the largest ever held by the Chamber.

As in previous years the work of the convention will be done largely in group sessions. Groups representing the major divisions of business will take up the questions before the meeting in their relation to the particular interests or industries comprised within the group.

International Chamber of Commerce to Meet

THE American section of the International Chamber of Commerce has just announced that the next general meeting of the International Chamber will be held in Rome, Italy, the week of March 19, 1923. Before this meeting the International Chamber committees will be able to consider the results of the Genoa Conference in so far as they affect industry and commerce. Based on the views of these committees, constructive plans will be made as to such further steps as should be taken to restore the trade of the world.

The next meeting of the executive committee of the International Chamber will be held in Paris on May 26, and will be followed by a meeting of the board of directors on July 10. At that time plans will be made for the general meeting.

International Railway Congress

THE ninth congress of the International Railway Association is in session in Rome, Italy; the period covered by the congress being April 18 to 30. Abstracts of the reports to the congress on heavy electric traction in a number of important countries have appeared in the following recent issues of this paper: Dec. 3, 1921, page 988; Jan. 28, 1922, page 147; Feb. 25, 1922, page 322.

Canadian Association Convention Plans

THE program for the annual convention of the Canadian Electric Railway Association is complete except for a few details. It will be held at Quebec, June 1 to 3. An abstract of the program follows:

JUNE 1

9:00 a.m. Registration.
Address of welcome.
Business session, including address of president and reports of committees.
Inspection of exhibits.
1:00 p.m. Get-together luncheon.
2:30 p.m. Paper by member.
2:45 p.m. Sightseeing around Quebec by trolley (ladies).
4:00 p.m. Paper by associate member.
5:00 p.m. Inspection of exhibits.
7:30 p.m. Association banquet.
10:00 p.m. Dancing.

JUNE 2

9:00 a.m. Inspection of exhibits.
10:00 a.m. Paper by member.
11:30 a.m. Trip to Quebec Bridge by boat.
Informal buffet luncheon on board.
2:30 p.m. Paper by associate member.
4:00 p.m. Unfinished business.
Election of officers.
4:30 p.m. Inspection of exhibits.
9:00 p.m. Annual reception and ball, Chateau Frontenac.

JUNE 3

Inspection of exhibits, and trips to Montmorency Falls and to Saguenay River.

A. E. S. C. Activities

NINETEEN standards have now been approved by the American Engineering Standards Committee, of which four have been approved as "American Standard," fourteen as "Tentative American Standard" and one as "Recommended American Practice."

This number includes the specifications and tests for portland cement, for which the A.S.T.M. is sponsor, which have been advanced to the full status "American Standard." In the list also as "Tentative American Standard" are the specifications for drain tiles of the same society.

The A.S.T.M. has submitted to the standards committee its specifications for purity of raw linseed oil from North American seed and for purity of boiler linseed oil from North American seed, as well as its standard methods for chemical analysis of lead, tin, antimony and copper. Approval as "Tentative American Standard" is asked for these specifications.

French Street Railway Association

AN EXTENDED account of the meeting Oct. 20-23, 1921, of the Street Railway & Automobile Association of France (Union des Voies Ferrées d'Intéret Local de France et des Transports Publics Automobiles de France) appears in *L'Industrie des Tramways*. The papers presented included reports on track construction, car design, power generation and distribution, trackless trolleys, the financial condition of interurban lines, the reorganization of the Paris tramway and bus system, airplane lines, the engineering status of the bus and railway electrification.

American Association News

Camden Section Boasts 283 Active Members

AT THE April 20 meeting of the Public Service Camden Section President C. V. Wallace announced that the section is now the largest, having 283 active members.

The principal speaker at this meeting was former Judge John B. Kates. His principal point was the dependence of one man on another in the present social order. He pointed out that it is utterly impossible for any one to stand alone, whether he occupies the smallest job or one of the greatest responsibility. An employee is practically a nonentity when isolated. The electric railway employee has a definite niche to fill, and if he does his duty effectively, pleasing the people who depend upon him, he will be rewarded in proportion to the extent to which he discharges his obligations. This reward may be represented in ways other than the pay envelope.

H. T. Stevenson, assistant to the president of the Public Service Railway, spoke on salesmanship. He explained that while an officer of the company may see not over ten men a day, a trainman often comes in contact with 500 or more. In the long run public opinion is molded by the platform men. He told of an experience of a Public Service conductor who made a warm friend for the company of a newspaper editor by the simple act of offering him a fare when the editor had left his money at home. Afterward, by way of appreciation, the editor sent the conductor a gift.

At the close of the meeting the entertainment committee announced that the next meeting would be "radio night."

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Home Rule Fight Staged

Campaign Started in Alabama to Have Regulatory Powers Returned to Cities

Preparations have been started for a fight at the next session of the Legislature to regain for the municipalities of Alabama the right to regulate the rates and service of their local utilities.

William L. Harrison, Commissioner of Public Utilities of the city of Birmingham, has taken the lead. On April 18 the City Commission adopted resolutions calling upon the Legislature to restore to the city its control over the rates and service of the Birmingham Railway, Light & Power Company, the Southern Bell Telephone Company and the Birmingham Water Works Company.

Steps for the formation of the statewide organization have already been taken. Letters are being sent out to every Mayor of cities or towns of Alabama which have public utilities of any kind. With these letters are being sent copies of the resolutions adopted by the Birmingham City Commission and the Mayors are being asked to have their Boards of Aldermen or the City Councils adopt similar resolutions. It is planned to call a meeting of representatives of all of the municipalities later.

Similar resolutions to those adopted in Birmingham have been presented to the City Commissions of Montgomery and Mobile. Commissioner Harrison and W. J. Wynn, City Attorney, made a trip to the two cities, where conferences were held with the commissions and assurances were given that Birmingham, Montgomery, and Mobile would act in concert and take the lead in the proposed fight to be waged before the Legislature at its coming session.

At the last session of the Alabama Legislature the public utility act was amended and all power to control or regulate either rates or service of local utilities was taken from the municipalities of the State and was vested in the Alabama Public Service Commission. This body was authorized to fix rates for all local utilities of the State and to prescribe the service regulations. It was also authorized to set aside contracts which had been made by the municipalities with the utilities.

The repeal of this amendment and the return of the right to regulate rates and service to the municipalities will be sought at the hands of the next Legislature, according to the plans now being worked out.

Commissioner Harrison stated that it is not the purpose of the city of Birmingham to open a fight on its utilities or on the Alabama Public Service Commission, but to regain some of the authority it has lost.

The city of Birmingham is now prosecuting a suit against the Birmingham Railway, Light & Power Company seeking to cancel its franchise because of increase in fare from 5 cents, as provided in its franchise, to 8 cents. The increase was granted by the Public Service Commission some time ago. The city is attacking the validity of the public utilities act on several grounds.

Democratic primary elections are to be held early in August and the general elections will be held in November. The meeting of the Legislature will take place some time later. Candidates running in the primary are in many instances making an issue of the Public Service Commission. Many have announced themselves in favor of curtailing its powers.

Asks Removal of One-Man Car Restrictions

The Jacksonville (Fla.) Traction Company, a Stone & Webster subsidiary, and now in receivership, has requested the city to eliminate the section of the ordinance regulating electric railway traffic which requires that a car crew shall consist of a conductor and a motorman. The company proposes to utilize one-man cars. Peter O. Knight, Stone & Webster counsel for the southeast, vice-president of the Tampa Electric Company, and General Manager T. J. Hanlon, Jr., have stated that the one-man car has been the major means of maintaining a nickel fare in Tampa.

Asks Winnipeg to Postpone Option

A. W. McLimont, vice-president of the Winnipeg (Man.), Electric Railway, has asked the City Council to postpone its option to purchase the railway from 1927 until 1937. In his letter to the Council Mr. McLimont stated that this would enable the company to float a satisfactory security and to care for the payment of all outstanding taxes, paving charges and damages caused by electrolysis; to complete the work of removing span wire poles, put wires underground and to make certain other recommended changes. The company, Mr. McLimont stated in this letter, will agree to extend its Talbot Avenue line from the present terminal to Panet Road and to make extensions on the Notre Dame and Academy Road lines, Notre Dame Avenue West Line, McGregor Street and Sargent Avenue lines, to enlarge the St. James subway for double tracking and to install bus service where necessary.

Detroit Preparing the Way

Forces Being Lined Up for Municipality to Take Over All Detroit Traction Lines

Initial steps are being taken in Detroit preparatory to the taking over of the Detroit United Railway city lines by the municipal street railway organization. The purchase agreement was ratified on April 17 and a bond issue voted to finance the initial payment and the purchase of supplies and miscellaneous equipment not included in the purchase plan but necessary for efficient operation by the city. An appraisal has been begun and an inventory is being made, including construction materials such as rails, ties, cement and miscellaneous materials.

It is the endeavor of the city officials to complete the inventory before May 15, the date set for the transfer. Officials of the municipal organization plan on taking over the lines with as little interruption of service as possible. Every effort will be put forth to insure efficient operation from the very beginning and to improve the service.

It has been announced by the municipal officials that as many of the present Detroit United Railway employees will be retained as can be used by the city and that preference will be given to employees who are inclined to work along the lines followed by employees of the present municipal lines and in accordance with the ideals of the officials of these lines. The first and most important aim will be to give courteous and efficient service.

It is planned to have a large number of uniformed municipal ownership employees stationed in the congested downtown districts at the most important points to aid in directing traffic.

An increase in the efficiency of the present Detroit United Railway employees has already been noticed since the city voted to take over the Detroit United Railway lines. No further developments have been reached in regard to the wage cut proposed by the Detroit United Railway earlier in the month, and it now appears unlikely that the wage question will be settled before the transfer is made and the lines are being operated by the city. The present plan is not to reduce wages.

Figures as to operating revenue of the Detroit United Railway for the first three months of the year have been submitted to the city by the company. This is the first report of this nature received by the city and the figures will be used as a basis in making up the budget for the entire municipal system combined with the present Detroit United Railway system for the coming year.

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Elevated Lease Reported Negotiated

At a conference at the Mayor's office on April 27 attended by Mayor Moore, Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, and Richard Weglein, president of the City Council, an agreement is said to have been reached by which the Philadelphia Rapid Transit Company will operate the Frankford elevated line for the city. The rental terms which the company will share are 1 per cent in 1923; 2 per cent in 1924; 3 per cent in 1925; 4 per cent in 1926; 5 per cent in 1927. The operation of the road will begin Nov. 5 of this year.

Mayor Moore announced after the Frankford "L" conference that the lease agreement would terminate at the end of five years unless the city gives notice that it wishes the lease continued.

In a statement the Mayor said President Mitten asked for co-operation of the administration and councilmanic forces of the city government in transit matters, and while assured of such co-operation it was pointed out that the city would reserve its rights under the 1907 agreement, the valuation proceedings and others of a legal nature.

It was also stated that the matter of extensions was discussed and it was announced that now that the Frankford "L" lease was out of the way, efforts would be made to extend the Philadelphia Rapid Transit System into sections of the city not now provided with service.

Commission Reiterates Its Rate Deflation Policy

In a summary of its decisions issued on April 24 by the Public Service Commission of New York, it is shown that gas, electric light, telephone and electric railway rates throughout the State have been materially reduced since the commission was appointed to office last April by Governor Miller. Furthermore, the policy of the commission, as expressed in the reduction orders, indicates that the commission intends to continue the rate reducing process as the costs of labor and materials decline.

In this connection the statement of the commission refers to an opinion rendered last fall by Chairman William A. Prendergast refusing an increase in fares in Utica, and concurred in by Commissioners Pooley, Van Voorhis, Semple and Blakeslee. In that decision, reviewed at length in the ELECTRIC RAILWAY JOURNAL at the time, the attitude of the commission regarding all public utility rates was set forth as follows:

> Public utilities, just as other departments of business, must expect to cope with periods of depression and short earnings, just as at other times they enjoy periods of prosperity and full dividends. If the public is expected to make up every deficiency in order to give a utility a good round rate of earning power, then the public is entitled to the benefit of the surplus over the agreed upon earning rate in times of prosperity.
>
> It must be borne in mind that we are not dealing with the conditions of 1920, nor with the previous abnormal years, but with the present period, which is one of profound economic readjustment. It is with this pregnant fact before us that a decision in this and similar cases must be made.

The commission, up to date, has put into effect about forty orders calling for reduction in rates or suspending proposed increased rates asked for by public utilities. In only seven cases have increases been permitted, and these of a very slight nature to gas and electric light companies in up-state communities where the cost of service is larger than in crowded sections because of the scattered population.

All of the reductions so far ordered are temporary and were made by the commission before the investigations into the various companies were completed. A further revision of these temporary rates will be made at the conclusion of the various hearings.

Learn About Dallas.—A special Dallas edition of "Partners," the official paper of the Dallas (Tex.) Railway, was issued under date of April 5, 1922. It contains some interesting facts and all possible information on the city of Dallas, compiled by the Dallas Chamber of Commerce. With its historical résumé and fine views this copy of "Partners" is something to keep for future use and reference. The pamphlet says that the effective sale of transportation must be based on knowledge of the city. If the Dallas trainmen assimilate one-half of the story they will certainly be living up to their reputation, namely, the best informed group of men in Dallas when it comes to giving information about Dallas.

Suits to Demand Electrification

Suit will be instituted by the municipal authorities of Buffalo, N. Y., against the seventeen railroad lines entering the city to force the companies to file plans for the electrification of their lines. Last November the City Council adopted an ordinance calling for electrification of the railroads by Jan. 1, 1923, and the filing of such plans with the city by Jan. 1, 1922. The failure of the lines to file the plans will prompt the suits. The railroads against which suits are threatened by the City Council are the New York Central, Pennsylvania, Delaware, Lackawanna & Western, and ten others.

Maurice C. Spratt, attorney for the New York Central, says the railroads have no intention of complying with the resolution of the Council, first because of the excessive cost and second because the city has no legal authority to compel the roads to expend such a large sum of money. Railroad engineers have estimated that it would cost the seventeen railroads entering Buffalo about $116,000,000 to comply with the ordinance. The Erie Railroad's share alone would exceed $22,000,000, a sum it could not possibly raise, Erie officials say.

Hearing Held on Bacharach Bill

Another hearing was held in Washington before the House judiciary committee on April 25 to consider the Bacharach bill, which would limit the jurisdiction of federal courts as to injunctions in matters pertaining to state public utility orders. The hearing was held before the whole committee, the time being given to the advocates of the measure. Another hearing will be held May 23. Mayor Hylan of New York, Ledyard P. Hale, counsel for the New York State Public Service Commission; John P. O'Brien, Corporation Counsel of New York, and John E. Benton, representing the National Association of Railway & Utilities Commissioners, were among those who appeared before the committee. Among those who listened to the testimony in opposition to the bill were E. A. Harriman, member of the legislative committee of the American Bar Association, and Senator Charles S. Thomas of the Bar Association of Colorado.

The witnesses in behalf of the bill voiced the complaint that state commissions are interfered with by the federal courts. They claimed that as exact justice can be had from the state administrative bodies and the state courts as from the federal courts. The indicated answer to this contention is that, while it is doubtless true in local matters, investors who are not residents of the state naturally look to the federal courts for protection.

Mayor Thompson of Chicago is to be heard on May 23, when the hearings on the measure will probably be concluded. The committee has given a great deal of time to the bill and has had a full explanation of its object. It was evident at the hearing that the opposition to the bill is very strong, especially in states where money is wanted for the extension of railroads and the development of natural resources. It was announced at the hearing that the committee had received telegrams from a number of state commissions opposing the bill on the ground that it would have a tendency, if enacted into law, to exclude capital from public utility enterprises.

Kinsella Mayor of Hartford

Richard J. Kinsella was elected Mayor of Hartford, Conn., April 4, after a campaign in which reduction of car fares was an important issue. Reduction of fares on the lines in Hartford of the Connecticut Company, isolation of the Hartford Division from the state system and curtailment of suburban trolley service during non-rush hours, which he announced as part of his traction plank for the campaign, met with disapproval among business men and taxpayers. They declared that this plan would increase unemployment, inconvenience the public and turn away shoppers from the city. Mr. Kinsella was elected Mayor four years ago, but was defeated at the next election.

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Right to Permit an Abandonment a Commission Function

The Montana Public Service Commission was granted final authority over the electric railways of the State in a decision delivered recently by Associate Justice Holloway in the Supreme Court. Judge Holloway reversed action of the Lewis and Clark County District Court in refusing the city of Helena an injunction against the Helena Light & Railway Company.

The railway had announced its intention of abandoning the Kenwood branch on the west side of the city. The city asked an injunction on the ground that the company was violating its franchise. The lower court refused to enjoin the company. The city appealed.

In its decision the higher court held that the Public Service Commission had the power to decide whether the railway had the right to abandon any of its lines on account of heavy losses sustained by insufficient business. Until the state body has acted, it was held, the company must discharge its obligation under its franchise.

Seattle Must Say Yes or No

The question facing residents of Seattle, Wash., at the election on May 2 is this: Shall they accept the proposal to support the municipal street railway by taxation, or shall they refuse it? If they accept it, fares will be reduced from the present 8½ cents to approximately 3 cents. If they refuse it, fares will stay where they are.

Advocates of the proposal for taxation maintenance say that the increased taxation will be more than offset by the reduction of fares. Opponents insist that increased taxes will drive away business. It has been estimated that the new plan would involve an increase in taxes varying in amount from $5,500,000 to $6,000,000, or between 20 and 22 mills. The total tax rate would approximate 85 mills. The proposal was brought to vote by an initiative petition. The plan was reviewed in the ELECTRIC RAILWAY JOURNAL for March 25, page 534.

Mayor Wants a New Deal

Mayor Hosey of Fort Wayne, Ind., has indicated that the Indiana Service Corporation, Fort Wayne, Ind., will be asked to enter into a new agreement with the city similar to the one surrendered when the company's operation passed completely under the supervision of the State Public Service Commission.

Two petitions of franchises to improve the city lines have been presented to the Board of Works by the company, one for the proposed double tracking of Pontiac Street and the other for the double tracking of South Wayne Avenue. Neither petition has been acted upon, although they have been on file several weeks. Mayor Hosey indicated that permission to carry on the work will not be granted until the company enters into a new agreement or franchise with the city.

In an effort to settle the Pontiac Street double-tracking proposition, which has been opposed by the residents of Pontiac Street, the railway called a mass meeting of the citizens in that section of the city at the neighborhood school, where it presented its side of the case. The company holds that the Pontiac line carries more traffic than any other line in the city, that new tracks are absolutely necessary and that the amount of traffic on the line will be greatly increased when the International Harvester Company's plant in the eastern end of the city is completed. The meeting was advertised in the local papers and the purpose of the meeting frankly stated in these advertisements.

Publicity Activities Approved by Commission

During various cases before the California State Railroad Commission in recent months in which public utilities have sought increases in rates, several contestants against the commission granting an increase have objected to the expenses for publicity contained in the operating expense exhibits offered to the commission by the utility companies. The contention has been advanced that utilities are not entitled to charge to their operating expenses the cost of advertising and expect the public to pay for it in the manner of increased rates.

To set the public right on this particular issue President Harley W. Brundige of the California State Railroad Commission has given his unqualified approval to the reasonable use of newspaper space by power and other public utilities of the State to promote and extend their business.

Franklin Hichborn of San Francisco questioned the commission as to the right of public utilities to charge advertising to operative account, especially in territory where competition is not a factor. Mr. Brundige has answered this gentleman by letter and has described newspaper advertising by public utilities as the most effective and cheapest form of salesmanship.

The protest to the commission followed the insertion of an advertisement by the Pacific Gas & Electric Company of San Francisco in a Santa Clara County publication, a region where the corporation holds a monopoly.

That utilities in certain fields do not have serious competition does not affect the proper use of advertising, Mr. Brundige contended, and he further pointed out that modern advertising seeks to create new business rather than to take business away from a competitor.

Mr. Brundige held that when advertising is reasonably and wisely used, measured by results obtained, and is not of the political propaganda type, it is a legitimate operating expense.

Reviews Boston Elevated Situation

James F. Jackson, chairman of the board of trustees of the Boston (Mass.) Elevated Railway, in a letter to Walter R. Mein, president of the United Improvement Association, recently stated that the present 10-cent fare could not be lowered until towns upon which the deficit of 1919 was assessed were paid back the money loaned by them. This amounts to $4,980,151.

Mr. Jackson's letter is a reply to the questions and suggestions presented at a conference between the Boston Elevated Railway and the United Improvement Association on Jan. 30.

To replace the worn-out equipment of the railway with new and modern material and to bring the service to an efficient point would cost about $6,000,000, according to Mr. Jackson. In three years the annual reserve for depreciation would care for the expenditures which normally should be cared for by current revenue.

The reserve for depreciation, said Mr. Jackson in his letter, is not being set aside as a capital asset. It is, instead, the fund which is being used by the trustees to replace deteriorated equipment. With it were purchased the majority of the 300 new center-entrance cars and eighty one-man cars, sixty-five elevated cars and forty Cambridge subway cars.

The 5-cent fare areas established between each of the long-distance trunk lines is, according to Mr. Jackson, part of the company's theory of developing a local service at a low fare which is "consistent with the flat fare that distributes population from congested centers to outlying districts and that can be made lower as relief from burdens and lessening costs permit."

Transportation Department for City in Prospect

The abolishment of the Department of Public Utilties, and the creation of a Transportation Department, making the Seattle (Wash.) Municipal Railway a separate branch of the city government, is proposed in an ordinance passed by the City Council, which will be submitted to the voters at the May 2 election as a charter amendment. Councilman Oliver T. Erickson, author of the amendment, claimed that the State under recent legislation has taken over most of the work performed by this branch of the city government. The Council was in favor, as a unit, for the charter amendment constituting the city's railway and bus system a separate and distinct department of the city government, and its executive head a member of the board of public works. As approved, the amendment creates the Department of Transportation, with a superintendent of transportation at its head, this official to be appointed for a three-year term by the Mayor, subject to confirmation by a majority vote of the Council.

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Financial and Corporate

Interborough Asks $400,000,000

This Value Is Placed on Rapid Transit Lines as Company's Price for Entering Transit Plan

James L. Quackenbush, counsel for the Interborough Rapid Transit Company, New York, N. Y.. served notice on the Transit Commission on April 21 that it could not hope to take over the Interborough at the figure of $174,-221,056 recommended by the commission's valuation bureau. He put in a company value of $399,873,697 and indicated that somewhere between these two figures there might be a chance of getting together on a price to be paid for turning the property over to the city for operation in connection with the proposed city-wide traction reorganization plan.

The statement was made at the opening of the valuation hearing which was begun on April 21 before the commission. Interborough figures were taken up first and there was a sharp clash between Clarence J. Shearn, special counsel to the Transit Commission, and the Interborough counsel. Mr. Quackenbush threatened to walk out of the hearing unless he was allowed to present the I. R. T. case as he saw fit and without what he termed "ungentlemanly interruptions." Chairman McAneny poured oil on the troubled waters and the matter was smoothed over.

Mr. Quackenbush wanted the commission to adopt a plan of arbitration to consider the figures of the chief engineer of the Transit Commission upon which the valuations were based. He claimed that the Transit Commission had this right under the dual subway contract. William A. De Ford objected and said that the Transit Commission should not be bound by any such arbitration.

It was decided that it might be feasible to go over the engineer's figures, which were the base figures upon which the valuations were built, in an arbitration with the city, the Transit Commission and the company represented. The commission, however, insisted upon the company bringing out its arguments against the Transit Bureau values at the opening hearing, and this proceeding was followed. The first witness was the Interborough Rapid Transit Company auditor, Edward F. J. Gaynor, who testified on the company figures.

Mr. Quackenbush said that, whereas the commission's valuation bureau had arrived at its figures by taking the cost to produce the property and deducting from it the cost of depreciation or the sum necessary to put it in first-class order, the company held that since the case was not a rate case, but one in which the commission sought to take the property away from the company, it must use a different method of fixing value. A rate fixed on the basis followed by the valuation bureau, Mr. Quackenbush held, could be changed if found unsatisfactory, but in this case there was no chance for correction. His company, he contended, should be allowed a price equal to the value of the property as of today, with the company allowed all the advantages of increase in values due to advance in market costs.

He said that as the commission had presented the "minimum value" it was the duty of the company to show the maximum. "That does not mean," he said, "that some lower figure might not ultimately be accepted. Somewhere between may be the figure that may be arrived at between the parties, as frequently is the case in all negotiations."

Mr. Quackenbush declared that nothing he said must be taken as an ultimatum that the company would not eventually reach an agreement with the commission. He declared, however, that "the method adopted by the valuation bureau in reporting the lowest possible value could not be adopted by the commission with any hope of success."

"However," he said, "I cannot imagine that the commission can hope or expect that the thousands upon thousands of security holders who have purchased notes and bonds to the extent of $200,-000,000 will consent to accept anything less than the face value of those securities."

In discussing the conferences in 1919 he declared that the inquiry into the affairs of the I. R. T. begun by Mayor Hylan had "blanketed at that time any chance of bringing about a reorganization of the traction companies."

The values for the I. R. T. property, according to the auditor's charges, and on the basis of prices of March, 1922, are shown in the accompanying table.

RECAPITULATION OF BOOK COST OF INTERBOROUGH RAPID TRANSIT COMPANY PROPERTY DEVOTED TO THE PUBLIC SERVICE TOGETHER WITH VALUE OF SUCH PROPERTY FOUND BY REVISING BOOK COST TO CONFORM TO PRICES PREVAILING IN MARCH, 1922

Title	Auditor's Charges		Charges Revised to March, 1922, Prices	
Contracts 1 and 2	$51,832,542(a)		$91,392,741	
Contract 3 and additions	108,079,433		174,113,997	
Belmont Tunnel (less $3,000,000)	9,068,329		5,895,174(b)	
Working Capital:				
Supplies	1,769,647(d)		1,769,647	
Cash	1,788,206(e)		1,788,206	
Totals		$172,538,157		$274,959,765
Manhattan third tracking	$22,033,751		$29,146,933	
Elevated extensions	13,818,096		18,101,536	
Manhattan power plant improvements	6,035,645		9,023,048	
Additions to company lines	341,350(c)		341,350	
Working Capital:				
Supplies	94,381(f)		94,381	
Cash	80,684(g)		80,684	
Totals		$42,403,907		$56,787,932
Grand totals or value of property for rate case		214,942,064		331,747,697
Add value of lease		68,126,000		68,126,000
Value for purpose of sale or exchange		$283,068,064		$399,873,697

(a) Does not include amounts paid in stock or cash to acquire Subway Construction Company assets and McDonald's one-quarter interest in subway lease.
(b) These figures represent auditor's charges with revised interest and taxes based upon a reasonable construction period. Cost of Belmont Tunnel (except the $3,000,000 allowance) not brought up to 1922 prices.
(c) Not revised to 1922 prices.
(d) This represents 60 per cent of total operating supplies carried for entire subway and Manhattan system.
(e) This sum represents one month's operating expenses and is a fair and reasonable allowance for cash working capital.
(f) Supplies on account of elevated extensions.
(g) One month's operating expenses of elevated extensions as cash working capital.
The figures for contracts 1 and 2 Belmont Tunnel are based upon auditor's records of Dec. 31, 1921, and as to contract 3 and certificates they are based upon auditor's records of Jan. 31, 1922.
The figures for operating supplies are based upon the book cost of the supplies in hand Feb. 28, 1922, and the cash part of working capital upon operating expenses for the month of January, 1922.

Short Abandonment Approved

Approval of the application of the Public Service Railway, Newark, N. J., to abandon its tracks and service on Main Street, Metuchen, between Benner's Corner and Amboy Avenue, has been received by the company from the Board of Public Utility Commissioners. At the same time the board dismissed the application of the Borough of Metuchen for discontinuance of a transfer charge on this same line.

The annual revenue for the line for 1921 was $1,807 and the cost of operation was $21,020. When the Public Service Railway took over the lines of the Brunswick Traction Company and the Raritan Traction Company, consolidating them into the Middlesex line, operating between New Brunswick and Perth Amboy, the shuttle service was started to carry out the franchise requirement. The distance was less than a mile.

It is probable that the company will ask the commission for permission to abandon its extension on Burnet Street, New Brunswick, N. J. The company is anxious to abandon the line because it is being operated at a loss and because of the cost it would have to bear when the street is repaved.

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TABLE I—COMBINED INCOME STATEMENT OF 180 URBAN AND INTERURBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	1921	1920	Increase	Per Cent Increase
Railway operating revenue	$437,493,853	$434,888,834	$2,605,019	0.6
Railway operating expenses	329,178,121	340,972,180	*11,794,059*	3.5
Net operating revenue..	$108,315,732	$93,916,654	14,399,078	15.5
Net revenue auxiliary operations	16,787,600	15,002,354	1,785,246	12.0
Taxes	30,024,892	27,483,316	2,541,576	9.2
Operating income	$95,078,440	$81,435,692	113,642,748	16.7
Non-operating income	9,787,092	9,050,219	736,873	8.1
Gross income	$104,865,532	$90,485,911	14,379,621	15.9
Income deductions	82,842,810	82,776,650	66,160	0.08
Net income	$22,022,722	$7,709,261	14,313,461	186.0
Operating ratio (per cent).	75.2	78.4	*3.2*	*4.1*
Ratio: Net income to operating revenue (per cent)	5.0	1.77	3.33	*188.0*

Note—Italics denote decrease.

TABLE II—COMBINED INCOME STATEMENT OF 103 URBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	1921	1920	Increase	Per Cent Increase
Railway operating revenue	$360,001,980	$353,621,533	$6,380,447	1.8
Railway operating expenses	268,067,041	277,092,799	*9,025,758*	3.3
Net operating revenue...	$91,934,939	$76,528,734	15,406,205	20.2
Net revenue auxiliary operations	12,123,253	10,816,576	1,306,677	12.2
Taxes	25,524,058	23,303,911	2,220,147	9.5
Operating income	$78,534,134	$64,041,399	14,492,735	22.7
Non-operating income	8,480,341	7,442,505	1,037,836	14.0
Gross income	$87,014,475	$71,483,904	15,530,571	21.7
Income deductions	65,094,550	65,244,583	*150,033*	*0.2*
Net income	$21,919,925	$6,239,321	15,680,604	252.0
Operating ratio (per cent)..	74.4	78.2	3.8	*4.9*
Ratio: Net income to operating revenue (per cent).	6.1	1.0	5.1	510.0

Note—Italics denote decrease.

TABLE III—COMBINED INCOME STATEMENT OF 77 INTERURBAN RAILWAYS FOR YEAR 1921 COMPARED WITH 1920

	1921	1920	Increase	Per Cent Increase
Railway operating revenue	$77,491,873	$81,267,301	*$3,775,428*	*4.65*
Railway operating expenses	61,111,080	63,879,381	*2,768,301*	*3.33*
Net operating revenue..	$16,380,793	$17,387,920	*1,007,127*	*5.80*
Net revenue auxiliary operations	4,664,347	4,185,778	478,569	11.43
Taxes	4,500,834	4,179,405	321,429	7.68
Operating income	$16,544,306	$17,394,293	*849,987*	*4.88*
Non-operating income	1,306,751	1,607,714	*300,963*	*18.72*
Gross income	$17,851,057	$19,002,007	*1,150,950*	*6.06*
Income deductions	17,748,260	17,532,067	216,193	12.33
Net income	$102,797	$1,469,940	*1,367,143*	*93.01*
Operating ratio (per cent).	78.86	78.60	0.26	0.33
Ratio: Net income to operating revenue (per cent)	0.13	1.81	*1.68*	*92.8*

Note—Italics denote decrease.

TABLE IV—COMBINED EXPENSE STATEMENT OF 180 URBAN AND INTERURBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	1921	1920	Increase	Per Cent Increase
Way and structure	$46,890,514	$43,750,874	$3,139,640	7.2
Equipment	41,259,495	44,080,195	*2,820,700*	*6.4*
Power	47,874,219	51,881,539	4,007,320	7.7
Conducting transportation	143,153,943	150,057,496	*6,903,553*	*4.6*
Traffic	947,415	1,189,383	*241,968*	*20.3*
General and miscellaneous	42,645,116	43,950,163	*1,305,008*	*3.0*
Transportation for investment credit	94,723	89,221	5,502	6.2
Total operating expenses	$329,178,121*	$340,972,180†	$11,794,059*	*3.5*

Note—Italics denote decrease.
* Includes $6,502,142 miscellaneous expenses.
† Includes $6,151,751 miscellaneous expenses.

TABLE V—COMBINED INCOME STATEMENT ON A CAR-MILE BASIS (IN CENTS) OF 103 URBAN, 77 INTERURBAN AND THE COMBINED TOTAL OF 180 URBAN AND INTERURBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	103 Urban Rys.			77 Interurban Rys.			180 Urban and Interurban Rys		
	1921	1920	Per Cent Increase	1921	1920	Per Cent Increase	1921	1920	Per Cent Increase
Railway operating revenue	46.5	44.7	4.0	47.5	49.5	*4.0*	46.7	45.5	2.6
Railway operating expenses	34.6	34.9	*0.9*	37.5	39.0	*3.9*	35.1	35.7	*1.7*
Net operating revenue	11.9	9.8	21.5	10.0	10.5	*4.8*	11.6	9.8	18.9
Net revenue auxiliary operations	1.6	1.4	14.3	2.9	2.6	11.5	1.7	1.6	6.3
Taxes	3.3	2.9	13.8	2.8	2.6	7.7	3.2	2.9	10.3
Operating income	10.2	8.3	22.9	10.1	10.5	*3.8*	10.1	8.5	18.8
Non-operating income	1.1	0.9	22.2	0.8	0.9	*11.1*	1.0	0.9	11.1
Gross income	11.3	9.2	22.8	10.9	11.4	*4.4*	11.1	9.5	16.9
Income deductions	8.4	8.3	1.2	10.8	10.7	0.9	8.8	8.7	1.2
Net income	2.9	0.9	222.0	0.1	0.7	*85.8*	2.3	0.8	187.6

Note—Italics denote decrease.

TABLE VI—COMBINED EXPENSE STATEMENT OF 103 URBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	1921	1920	Increase	Per Cent Increase
Way and structures	$35,899,696	$33,565,078	$2,334,618	6.9
Equipment	32,579,011	34,877,432	*2,298,421*	*6.6*
Power	38,168,508	41,174,482	*3,005,974*	*7.3*
Conducting transportation.	120,672,081	126,412,887	*5,740,806*	*4.6*
Traffic	444,168	716,407	272,239	*38.0*
General and miscellaneous.	33,928,155	34,332,713	*404,558*	*1.2*
Transportation for investment—credit	42,634	27,667	14,967	54.2
Total operating expenses	$268,067,041*	$277,092,799†	*$9,025,758*	*3.3*

Note—Italics denote decrease.
* Includes $6,418,056 miscellaneous expenses.
† Includes $6,041,467 miscellaneous expenses.

TABLE VII—COMBINED EXPENSE STATEMENT OF 77 INTERURBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	1921	1920	Increase	Per Cent Increase
Way and structures	$10,990,818	$10,185,796	$805,022	7.32
Equipment	8,680,484	9,202,763	*522,279*	*5.67*
Power	9,705,711	10,707,057	1,001,346	9.35
Conducting transportation	22,481,862	23,644,609	1,162,747	*4.92*
Traffic	503,247	472,976	30,271	6.02
General and miscellaneous	8,716,961	9,617,450	*900,489*	*9.36*
Transportation for investment—credit	52,089	61,554	*9,465*	*15.37*
Total operating expenses	$61,111,080*	$63,879,381†	*$2,768,301*	*4.33*

Note—Italics denote decrease.
* Includes $84,086 miscellaneous expenses.
† Includes $110,284 miscellaneous expenses.

TABLE VIII—COMBINED EXPENSE STATEMENT ON A CAR-MILE BASIS (IN CENTS) OF 103 URBAN, 77 INTERURBAN AND A COMBINED TOTAL OF 180 URBAN AND INTERURBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	103 Urban Rys.			77 Interurban Rys.			180 Urban and Interurban Rys.		
	1921	1920	Per Cent Increase	1921	1920	Per Cent Increase	1921	1920	Per Cent Increase
Way and structures	4.6	4.2	9.5	6.7	6.2	8.1	5.0	4.6	8.7
Equipment	4.2	4.4	*4.6*	5.3	5.6	*5.4*	4.4	4.6	*4.4*
Power	4.9	5.2	*5.8*	5.9	6.5	*9.2*	5.1	5.4	*5.6*
Conducting transportation	15.6	15.9	*1.9*	13.9	14.5	*4.2*	15.3	15.7	*2.6*
Traffic	0.06	0.09	*33.3*	0.3	0.3	....	0.1	0.1	....
General and miscellaneous	4.4	4.3	2.3	5.4	5.9	*8.5*	4.6	4.6	....
Transportation for investment—credit	0.006	0.004	50.0	0.03	0.04	*25.0*	0.01	0.009	11.1
Total operating expenses	*34.6c.	†34.9c.	*0.9*	(a)37.5c.	(b)39.0c.	*3.9*	(c)35.1c.	(d)35.7c.	*1.7*

Note—Italics denote decrease.
* Includes 0.8 cent miscellaneous expenses. † Includes 0.8 cent miscellaneous expenses. (a) Includes 0.05 cent miscellaneous expenses. (b) Includes 0.07 cent miscellaneous expenses. (c) Includes 0.07 cent miscellaneous expenses. (d) Includes 0.06 cent miscellaneous expenses.

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Conditions Improved

Survey for 1921 Shows Greatest Improvement on City Lines—Better Business Conditions Will Help Interurbans.

The financial condition of city electric lines is steadily improving, but this improvement has not yet reached the interurban lines. This is the outstanding fact revealed in the review of conditions in the industry based on official revised operating returns from 180 companies representing more than 50 per cent of the total industry in the United States for the year 1921 and subsequent supplemental reports.

Of these lines 103 are city lines and seventy-seven interurban. Their total operating revenue for 1921 was $437,493,853, as compared with $650,149,806 for the entire industry as reported by the United States Census for 1917.

The actual volume of business shows a slight decrease over 1920, but improved operating conditions have helped finances. The outstanding feature of the combined reports as made public by the information bureau of the American Electric Railway Association is the increase in net income after the payment of all expenses and charges. In 1921 this amounted to $22,022,722, as compared with $7,709,261 in 1920. In the face of the unusual business depression in 1921 with unemployment at the maximum, this net income figure is considered remarkable. As the association sees it, however, the figures are merely indicative of the great underlying strength of the industry, the real necessity for the service which it rendered and its ability to withstand serious industrial disturbances.

Traffic on these 180 properties fell from 7,606,190,270 in 1920 to 7,144,332,920 in 1921, a decrease of 6.1 per cent. The total operating expenses of these 180 companies decreased from $340,972,180 in 1920 to $327,178,121 in 1921, a drop of 3.5 per cent. The operating ratio dropped from 78.4 per cent in 1920 to 75.2 per cent in 1921.

The net operating revenue as a result of increased revenues and lowered operating expenses increased from $93,916,654 to $108,315,732, or 15.5 per cent. Net revenues from auxiliary resources increased $1,785,246. The surplus created by this increase was cut down slightly by an increase of $2,541,576 in taxes.

The net income of $22,022,722 earned in 1921 amounted to 5 per cent of the total operating revenue, whereas in 1920 it amounted to only 1.8 per cent.

As for the interurban field, a hopeful sign is the decrease in the operating expenses of these companies, which is relatively greater than that of the city companies.

Expenditures for maintenance of way and structures of 180 companies, both city and interurban, were 7 per cent greater in 1921 than in 1920, while expenditures in other departments show substantial decreases, due probably to the cost of labor and materials. The cost of conducting transportation of these 180 companies, the principal item in which is wages of trainmen, was $6,903,353, or 4.6 per cent less than in 1920. The companies ran 18,653,967 fewer car-miles than in 1920. Power costs showed the largest decrease of all the items making up operating expenses.

One-fourth of all passengers riding used transfers, a slight increase over the number using transfers for 1920.

The figures in detail on which the foregoing statements are based are contained in the accompanying tables.

District Merger Agitated Again

The Public Utilities Commission of the District of Columbia is looking into its organic act to determine if it can authorize a merger of the Washington Railway & Electric Company and the Capital Traction Company in Washington. The merger question has been agitated for some time on the ground that it is the only solution for the existing traction difficulties—one company requiring a higher rate of fare than the other, although the commission has prescribed a uniform fare, which yields a greater return to one company than the other. Merger legislation has been proposed in Congress, but no action has been taken owing to conflicting views. The commission has requested the Corporation Counsel of the District for an opinion as to whether its organic act empowers it to merge the two lines.

TABLE IX—COMBINED STATEMENT OF TRAFFIC STATISTICS FOR 103 URBAN, 78 INTERURBAN AND THE COMBINED TOTAL OF 181 URBAN AND INTERURBAN RAILWAYS FOR 1921 COMPARED WITH 1920

	103 Urban Electric Railways			77 Interurban Electric Railways			180 Interurban and Urban Electric Rys.		
	1921	1920	Per Cent Increase	1921	1920	Per Cent Increase	1921	1920	Per Cent Increase
Car-miles (revenue)	773,852,686	791,817,382	*2.3*	163,077,867	163,767,138	*0.4*	936,930,553	955,584,520	*2.0*
Car-hours (revenue) (a)	79,988,260	82,166,716	*2.7*	10,349,271	10,589,509	*2.3*	90,337,531	92,756,225	*2.6*
Total passengers	6,467,009,091	6,860,771,966	*5.8*	677,323,829	745,418,304	*9.1*	7,144,332,920	7,606,190,270	*6.1*
Revenue passengers	5,075,480,639	5,437,465,186	*6.7*	597,445,113	661,064,968	*9.6*	5,672,925,752	6,098,530,154	*7.0*
Transfer passengers	1,336,302,729	1,386,635,325	*3.6*	67,672,399	71,943,167	*5.9*	1,403,975,128	1,458,578,492	*3.8*
Miles of single track	12,300.0	12,296.3	0.03	6,972.6	6,960.4	0.2	19,272.6	19,256.7	0.08
Cars operated (b)	18,142	18,715	*3.1*	1,787	1,803	*0.9*	19,929	20,518	*2.9*
Passenger revenue	349,685,974	342,180,810	2.2	63,355,620	66,836,868	*5.2*	413,041,595	409,017,678	0.9

Note—Italics denote decrease

(a) Car-hours were reported by only ninety-eight city companies and sixty interurban companies.
(b) Cars operated (average maximum number in service daily) were reported by only ninety city companies and fifty-five interurban companies.

TABLE X—SOME SIGNIFICANT RATIOS DERIVED FROM THE FIGURES SHOWN IN TABLES I TO IX.

	103 Urban Electric Railways			77 Interurban Electric Rys.			180 Urban & Interurban Elec. Rys.		
	1921	1920	Per Cent Inc.	1921	1920	Per Cent Inc.	1921	1920	Per Cent Inc.
Railway operating revenue:									
Per mile of single track	$29,269	$28,759	1.8	$11,114	$111,676	*4.8*	$22,700	$22,584	.7
Passenger revenue:									
Per revenue passenger	6.9c.	6.3c.	9.5	10.6c.	10.1c.	5.0	7.3c.	6.7c.	9.0
Per total passengers	5.4	5.0	8.0	9.4	9.0	4.5	5.8	5.4	7.4
Per mile of single track	$28,430	$27,828	2.2	$9,086	$9,602	*5.4*	$21,432	$21,240	1.0
Per car-mile	45.2c.	43.2c.	4.6	39.0	40.7c.	*4.2*	43.6c.	42.8c.	1.9
Per car operated daily	$17,522(a)	$16,548(a)	5.9	$22,530(b)	$24,539(b)	*8.2*	$17,971(c)	$17,250(c)	4.2
Per car-hour	$4.14(d)	$3.94(d)	5.1	$4.45(e)	$4.72(e)	*5.7*	$4.18(f)	$4.03(f)	3.7
Revenue passengers:									
Per mile of single track	412,641	442,203	*6.7*	85,684	94,975	*9.8*	294,352	316,697	*7.0*
Per car-mile	6.6	6.9	*4.4*	3.7	4.0	*17.5*	6.1	6.4	*4.7*
Per car operated daily	252,509(a)	260,034(a)	*2.9*	226,989(b)	258,932(b)	*12.3*	250,221(c)	259,938(c)	*3.7*
Per car-hour	59.6(d)	62.0(d)	*3.9*	45.1(e)	50.2(e)	*0.2*	58.0(f)	60.6(f)	*4.3*
Per mile of single track	525,773	557,954	*5.8*	97,141	107,094	*9.3*	370,699	394,989	*6.2*
Per car-mile	8.3	8.6	*3.5*	4.1	4.5	*8.9*	7.6	8.0	*5.0*
Ratio:									
Transfer passengers to revenue passengers	26.4%	25.6%	3.2	11.3%	10.9%	3.7	24.70	24.00	*2.9*
Car-miles:									
Per mile of single track	62,914	64,394	*2.3*	23,388	23,528	*0.6*	48,615	49,623	*2.0*
Per car operated daily	38,550(a)	38,071(a)	1.3	56,856(b)	57,211(b)	*0.6*	40,191(c)	39,753(c)	1.1
Per car-hour	9.2(d)	9.1(d)	1.1	11.0(e)	1.8(e)	0.02	9.4(f)	9.3(f)	1.1
Car-hours:									
Per car operated daily	4,204(g)	$4,182(g)	0.5	4,933(h)	5,004(h)	*1.4*	4,268(h)	4,252(i)	4.0

Note—Italics denote decrease. (a) Ninety companies. (b) Fifty-five companies. (c) One hundred and forty-five companies. (d) Ninety-eight companies. (e) Sixty companies. (f) One hundred and fifty-eight companies. (g) Eighty-eight companies. (h) Fifty-five companies. (i) One hundred and forty-three companies.

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Receivers for Queens Lines

Justice Stephen Callaghan, in the Supreme Court at Long Island City on April 28, handed down a decision appointing S. W. Huff, president of the Third Avenue Railway, and Robert C. Lee, an insurance broker, as receivers for the New York & Queens County Railway. The appointment was made on the application of the Guaranty Trust Company, New York, N. Y., as trustee under the first mortgage of the Steinway Railway of Long Island City, dated 1892. In its application for a receiver the Guaranty Trust Company declared that the company defaulted on Jan. 1 in the payment of $45,000 interest due on the mortgage of $1,500,000.

New York Bankers Acquire Power Company Control

A. E. Fitkin & Company, New York, N. Y., have acquired control of the Tide Water Power Company, Wilmington, N. C., a city of 35,000 population, it was announced on April 27. The properties taken over in the deal include an electric light and power plant, a gas plant and electric railway systems serving the North Carolina city and interurban territory. The interurban line runs 12 miles to Wrightsville Beach on the ocean, where the company has an amusement pier, a casino and a large auditorium for convention purposes.

Discuss Purchase of Market Street Railway by City of San Francisco

The question of the best methods of procedure in the acquisition of the Market Street Railway by the city of San Francisco has been the subject of recent conferences between city and company officials. The city has been represented by George Lull, city attorney, and the company by William Von Phul, president, and William N. Abbott, chief counsel.

The plan of purchase now being discussed is based upon the method provided for in charter amendment No. 30 passed by the voters on Nov. 2, 1920. A $14,000,000 bond issue would have to be passed to pay off the company's indebtedness that falls due in 1924 and the remainder of the purchase price would be paid out of the earnings of the system on the pay-as-you-go basis, the city to contract to pay a guaranteed amount each year.

The $14,000,000 bond issue would require a two-thirds vote. The bonds could be made to cover a period of years ample for the city to redeem them. It would also be necessary to amend the city charter to allow the city to operate the San Mateo branch of the company which goes outside city limits.

The price has not been decided, but it is expected to be in the neighborhood of $40,000,000. This is the value of the property as estimated by M. M. O'Shaughnessy, city engineer. If that were to be the agreed price the city would pay $14,000,000 in bonds in 1924 and the remaining $26,000,000 out of earnings of the utility. Mr. Lull states that this would be the most advantageous method of procedure for the city and would be well within the city's limit of bonded indebtedness.

Joliet & Eastern Traction Stops Service

The Joliet & Eastern Traction Company, Joliet, Ill., operating a 23-mile interurban line between Joliet and Chicago Heights, discontinued service on April 15. Permission to cease operation and junk the property was given by the Illinois Commerce Commission when it was shown that the road was no longer financially able to continue business. The petition for discontinuance was filed with the commission by Receiver Eckmann several months ago. The road will be dismantled in the near future.

The action on the part of the railway was brought about by the coincident necessity for the expenditure of a considerable sum of money for changes in its property that in no way would benefit the railway or increase the value of its service. The largest expenditure impending was at Matteson, where the railway would have been obliged to remove its overhead construction to allow the elevation of the tracks of the Illinois Central Railroad. Other obligations, such as paving charges, track changes, etc., caused by city improvement, have come also at this time. The railway exhausted its reserve some time ago and has been operated at a loss, though every means of increasing the revenue has been tried. Besides its passenger service, the railway was giving a freight and package service and carrying the mails.

The underlying reason for discontinuing operation, however, as stated by E. H. Stearns, secretary of the company, was the increased use of private automobiles. Their popularity and number have rapidly been increasing and the completion soon of a cement highway paralleling the railway's right-of-way will make electric interurban service still more impracticable. The railway has also had to operate in competition with the Michigan Central Railroad and the Elgin, Joliet & Eastern Railroad between Joliet and Chicago Heights.

The company's property consists of 25 miles of single track, five motor passenger cars, three motor freight cars and two other cars. The company purchased energy from the Public Service Company of Northern Illinois. The repair shops were located at Frankfort.

The company was incorporated in Illinois in 1914. It represents the reorganized portion of the Joliet & Southern Traction Company, operating between Joliet and Chicago Heights. The property was appraised by the Illinois Commission, which authorized stock to be issued to the amount of $269,000 and additional $31,000 for cash received. There is outstanding $300,000 capital stock, but no bonds.

Resumes Partial Payment

The Third Avenue Railway, New York, N. Y., resumed partial payment of interest on the adjustment 5 per cent bonds this month, with the payment of 1¼ per cent. There still remains 22½ per cent interest on these bonds in arrears, which must be paid before there can be any return to the stockholders. However, the critical stage of the affairs of the company is past. These facts were contained in a letter to a stockholder who suggested that a protective committee of fifteen be organized. S. W. Huff, the president, stated that since the company is not in the hands of receivers the directors are in fact the stockholders' committee. The company also has protested against the valuations placed on the properties of the Transit Commission in a letter by Mr. Huff to the commission. Mr. Huff makes the statement that the cost to reproduce the property even with allowances for depreciation would be more than twice the amount recommended by the engineers for the commission.

Toledo $87,000 Ahead for March, 1922, Over Similar Month in 1921

As a result of March operations of the Community Traction Company, Toledo, Ohio, there has been added to the fare stabilizing fund $13,549, an increase over the credit for February of $8,619. Gross revenue for the month amounted to $307,827 as compared with gross revenue for February of $281,196, the increase in this instance being entirely due to the greater number of days in March.

The ratio of operating expense to gross income of 69.405 per cent was a slight decrease from the operating ratio for the month of February.

During the month there were operated 639,656 car miles as compared with 574,221 for the previous month. Revenue passengers per car mile of 7.76 represents a decrease of 0.15 passenger per car mile as compared with February.

During the month there were carried 4,965,140 revenue passengers while for the same month last year there were carried 5,710,010, a decrease of 744,879. By reason of operating economies and despite the decrease in riding it was possible to show a surplus of more than $13,000 for March this year as compared with a deficit of $73,755 for the same month last year.

Ordinance requirements as to credits to the various funds and reserves have been complied with, and, in addition, interest earned on bonds retired amounting to $745 for the month has been added to the sinking fund.

Seeks Termination of Receivership

The Binghamton (N. Y.) Railway has announced its intention of applying for the sale of the property and the discharge of the receiver.

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Traffic and Transportation

Fares Discussed in Dallas

City Contends Company Has Not Lived Up to the Terms of Temporary Fare Increase

Hearings are now being conducted in Dallas, Tex., before the City Commission on a proposal to order the Dallas Railway to restore the 5-cent fare as provided in the franchise granted in 1917. The hearing was opened by the city when it was disclosed that the Dallas Railway had used $500,000 of its earnings under the 6-cent fare over and above the 7 per cent authorized return under its franchise, in payment of past-due dividends.

The company claimed that the franchise guaranteed a return of 7 per cent on its investment, and that all unpaid dividends should be paid out of excess earnings before any of such earnings were used in improvements, betterments or for any other purpose.

The city in turn claimed that the 6-cent fare was granted in 1920 under the express provision that the earnings thus made possible would be used in street paving and other improvements ordered by the city and claimed by the company to be impossible because of inadequate returns.

At the opening of the hearing, Attorney J. A. Worsham, representing the railway, filed a lengthy statement setting forth the position of the company. To the statement was appended a table showing receipts and disbursements for 1921.

The statement, as read by Mr. Worsham, attacked the fairness of the 1917 franchise given the company by the city on the grounds that its provisions do not afford a sufficient maintenance and depreciation fund. The statement stressed the point that under the 6-cent fare a maintenance fund of only $9,000 is on hand, when the company claims a sum of $1,000,000 should be afforded. Mr. Worsham said:

> It has been proved that the authorized return of 7 per cent that the company receives under the terms of the franchise now in force is inadequate, and that 8 per cent would be a fairer rate. The company can barely subsist on the present schedule, and the reduction of the fare to 5 cents will lead to bankruptcy for the company and total loss to its stockholders.
>
> The property value stated in the franchise is $9,333,000, while the actual property value is closer to $13,000,000. The whole thing is simply a matter of calculation. The amount of return necessary to operate this business successfully is a formula that can be deduced from a consideration of the property value involved, the receipts, the disbursements and the depreciation that must be allowed for.
>
> The question of fare is not contractual. We maintain that instead of a 7 per cent return, 8 per cent would be fairer, and that at least 4 per cent should be allowed for depreciation to property and 2 per cent for depreciation of buildings.

Interesting testimony regarding the condition of the Dallas Railway's properties was given by Richard Meriwether, vice-president and general manager. Mr. Meriwether said that when the Dallas Railway was first requested in the fall of 1920 to assist the city in the paving of certain streets on which it had tracks, it was unable to do so because it had no funds and no credit. It will be able to help now to the extent of $101,000, Mr. Meriwether said, because it will be able to borrow this sum from its stockholders.

In summing up the situation confronting the company Mr. Meriwether said:

> The company is in an embarrassing financial position now, and unless relieved within the next two years, in some manner, the situation will become gravely embarrassing. There is $60,000 due on Lamar Street improvements now, for example, and only $9,000 available, unless we are permitted to borrow from the stockholders.
>
> The 18 per cent reserve that has been set aside under the terms of the 1917 franchise is not enough to care for the actual repairs to rolling stock and tracks.
>
> Two of the leading lines in the city, the Ervay line and the Bryan line out Live Oak, are in bad condition. They must be repaired. They each make about $21,000 a month. The Bryan line situation could be taken care of by routing the cars across Cantegral and down Swiss, but there is no way to meet the Ervay Street emergency. These are two of the heaviest traveled routes in the city.
>
> All the officers have discussed the fact that the property is wearing out and that there are no funds available to replace it. The stockholders know that the company is skating on very thin ice. The rate payer of the past hasn't been made to do his part. A collapse of the company will not only be a calamity to the stockholders but to the public as well.
>
> The money disbursed to the stockholders belonged to them under the terms of the franchise. The fund that it was applied on is still $558,000 in arrears.
>
> Some of the double-truck cars in the city now have been in service for eighteen or twenty years. The company owns 138 double-truck cars and sixty-eight single-truck. It leases fifty big double-truck cars from the old Northern Texas Traction Company. These latter cost probably $6,500 apiece. The others about $5,000. The life of the average car is twenty years, and about 25 per cent of those now in operation here should be replaced.

Right to Examine Books Established

Through an order by Judge H. D. Dickinson of the district court on April 21, the city attorney will have only one day to examine the books of the Twin City Rapid Transit Company, Minneapolis, in case they are produced, before the hearing on an alternative writ of mandamus petition. The proceedings have been established to disclose the relationship between the Minneapolis Street Railway and the Twin City Company. The judge on April 21 continued the time for the company to answer a motion to show why the books should not be produced to April 24. The other hearing had been set for April 25, the day following. The city wants to inspect these books and records to prepare its case for the mandamus suit hearing. The company alleges these books have nothing to do with the Minneapolis Street Railway case. The extension of time was given on request of counsel for the railway.

Commutation Rate Fixed

New Jersey Board Authorizes Monthly Ticket Based on Modification of Muscatine Plan

As an experiment in evolving a satisfactory plan of providing necessary revenues, the Board of Public Utility Commissioners of New Jersey has granted permission to the New Jersey Central Traction Company to establish a base rate of 10 cents in each of its seven fare zones with a form of commutation ticket under which lower rates may be obtained by more frequent riders. The new plan is to be put into operation within four weeks and is to receive a six months trial.

The plan authorized by the board is that riders desiring to do so may purchase a commutation ticket, paying $1 for each zone in which they desire transportation. The commutation ticket so issued is to be good for one calendar month and is to entitle the holder to transportation for not more than 100 rides a month at the rate of 5 cents per ride. Any passenger traveling beyond the zone covered by his commutation ticket will be required to pay the base rate of 10 cents. Under the plan a person holding a commutation ticket for one zone, for which he pays the monthly flat rate of $1, will pay a total of $6 if he takes 100 rides a month, or a 6-cent fare.

The commutation rate would increase in proportion to the diminishing number of rides, so that a person riding only twenty times a month would pay the base rate of 10 cents. The commutation plan suggested by the company as a substitute for a flat increase in fare contemplated the purchase of commutation tickets for $1.50 in each zone. This plan would have resulted in a minimum fare of 6½ cents, instead of 6, and the base rate of 10 cents would be reached by the passenger riding thirty times a month instead of twenty times, as under the $1 rate fixed by the commission.

In behalf of the objecting municipalities it was contended that the proposal to charge $1.50 a zone was too high and would discourage the purpose of the entire plan. In this estimate the board assumed that 22 per cent of the total cash fares would become commutation fares. It also assumed that holders of commutation tickets would ride more frequently, causing an increase of 20 per cent among such riders. Of the remaining 78 per cent not holding commutation tickets the commission assumed that 10 per cent would cease riding due to increase in fare. The net result of this computation would give the company a total annual revenue of $389,752, instead of a revenue of $311,694 for the past year.

The company asked for a rate yielding a total revenue of $400,000 a year. The commission believed, however, that the rate established may reasonably be expected to provide the full amount which the company deems necessary for its continued successful operation.

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Weekly Pass Suggested for Use in Fort Smith

By a vote of two to one the City Council of Fort Smith, Ark., has ordered the Fort Smith Light & Traction Company to attend a hearing on rates to be held on May 13. The company's proposal for a three months tryout of the weekly pass plan was disregarded by the commissioners.

At the hearing on rates a return to a 6-cent fare was proposed, but the order was changed to a formal notice to the company to appear in a hearing on rates, when the city attorney told the commission that it could not change the rate without a three days notice and a formal hearing.

D. C. Green, manager of the company, and Judge Joseph M. Hill, its attorney, indicated that the company will contest through the courts any change in its schedule which results in a reduction in revenue.

Mayor Fagan Bourland voted against the motion to bring about a reduction in fare, stating that if the company was making money he would be the first one to vote for a reduction. He called attention to the fact that figures had been presented and sworn to by the company's auditor showing that the company is not making a fair return on its investment.

The hearing was occasioned by a petition for a return to the 5-cent fare.

Manager Green proposed to issue a weekly pass for $1.25.

Steady and continuous reduction in revenue was shown by figures presented by Mr. Green and sworn to by the company's auditor.

Railway Criticised for Not "Selling" Its Rides

Walter Jackson argues for the retention of the 5-cent radial fare and the use of the weekly pass in Bridgeport in three articles written for the Bridgeport *Post* at the solicitation of the editor of that paper and contributed to the issues of April 21, 22 and 24. He considers the present fare plan, with ameliorations here and there, to be excellent for traffic stimulation, but thinks that it lacks the advantages of the pass in this respect and that the Connecticut Company has been lax in advertising the existing service.

Praise for Ed Walker

The Terre Haute *Tribune* said some mighty nice things about the local traction line, in charge of E. M. Walker, in a recent issue. The occasion for this comment was the announcement by the Terre Haute Traction & Light Company of its decision to install the weekly pass. A considerable part of the editorial was devoted to telling about the pass itself and how it would benefit the public. Some of the more complimentary things in the editorial are contained in the following extract:

> While many traction lines are asking for increased rates, the Terre Haute lines, which, by the way, have never advanced the fare over 5 cents, are striking out for more business at the 5-cent fare or less. In other words, the traction company desires a more general use of the cars.
>
> It is interesting to know that the local traction lines are in a position to offer this mutually advantageous proposition. Many such concerns are going the other way, demanding higher rates and resorting to other such extremities to keep out of receivership. It is certain the public here will not only meet the idea half way, but will be appreciative of this unusual manifestation of mutual interest by a public utility.

Injunction Against Jitneys Made Permanent

Kansas City, Mo., ordinances regulating jitneys on the streets of the city have again been upheld by the local courts. On April 17 Judge Nelson E. Johnson of the Circuit Court made permanent a temporary injunction issued by him on Nov. 10, 1921, restraining operators from violating the two jitney ordinances and from conducting business as jitneys on the streets contrary to the provisions of the ordinances. The order is especially significant on the point of violating "by mere subterfuge, shift or device, including, among others, the subterfuge of accepting as a 'gift,' 'gratuity' or otherwise compensation for carrying persons in their cars."

Jitney operators have been running since Nov. 10 without ostensibly charging for their service. The court makes it very clear that the intent is to regulate the "jitney business" and that the operation of jitneys is obviously a business transacted on the public streets. The decision is made against the jitneys on the basis of the right of the city to regulate the use of its streets.

City and Company Argue Abandonment

The City Council of Carlisle, Pa., answered the threat of the Valley Railways, Lemoyne, Pa., to discontinue its service within the city of Carlisle, by telling the company it must do one of two things: discontinue service on all lines in Carlisle and as far east as Boiling Springs, or continue the present service unchanged.

The Council says that the charter of the Cumberland Valley Electric Passenger Railway, which the Valley Railways is operating, calls for service from Boiling Springs to Carlisle and in Carlisle. The charter also states that the company must pay for paving required between the company's tracks. Recent bills of the Council call for paving which would cost the company $11,000. This amount the company said it could not pay, and would withdraw its service to the borough limits. The franchise, however, requires the company to restore the streets to their original condition after tearing up the tracks and poles and taking down the wires. This, according to the Council, would cost the company $44,000.

It would abandon the Cave Hill line, which gives a local service, from the interurban line within the Carlisle city limits, according to its present plans. The interurban operates from Fort Washington to Carlisle.

Fare Injunction Case Being Argued

Application of the Chicago Surface Lines for an injunction against the 6-cent fare order was argued in the United States District Court on April 24 before Judges Evans, Page and Geiger. The hearing was to be concluded later in the week, as the effective date of the order was set originally as May 1.

This is the order entered by the Illinois Commerce Commission on April 8 which proposed to limit the return of the surface lines to 5 per cent and to cut out certain operating expenses so as to make the charging of a 6-cent fare possible.

The companies' attorneys insisted that such a rate would be confiscatory. They also attacked the conclusions of the commission that the lower rate would attract 50,000,000 additional passengers and that no allowance had been made for the expense of this extra burden. Counsel for the city argued that the new rate should be tried and if it resulted in a loss the companies could be compensated.

Mayor Thompson of Chicago has announced that he and members of his cabinet will visit New York City in the near future as guests of Mayor Hylan in the study of local transportation facilities and how they are handled on a 5-cent fare.

300 New Cars Needed, According to Commission Expert

Need for 311 more steel cars on the Brooklyn Rapid Transit Company's subway and elevated lines was expressed on April 24 by Walter T. Edgerton, assistant supervising inspector for the New York Transit Commission at the commission's hearing into the adequacy of the service now being furnished by the company. These are needed, Mr. Edgerton said, in addition to the 900 cars which the company says it will have in service within thirty days, and the total should not include cars that are laid up for repairs but the number that are actually in daily use on the tracks.

Mr. Edgerton also pointed out variances in the service of the Brooklyn Rapid Transit. He said that on some days there might be a fair service in handling the rush hour crowds to Manhattan in the morning, while the service in the evening would be entirely inadequate.

Mayor Hylan also took occasion to step into Brooklyn Rapid Transit matters on April 24 when he wrote to John P. O'Brien, Corporation Counsel, suggesting an investigation into the expenses incurred by the receiver of the company. His suggestion follows the suit instituted a few days ago by Lindley M. Garrison, the receiver, against the city for $30,000,000 damages for failure by the city to carry out its part of the contract under which the rapid transit lines are operated under lease from the city.

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Personal Mention

More Honors for E. A. Robert

Popular and Efficient Leader of Many Montreal Utility Companies Is Elected President of Quebec Railway, Light, Heat & Power Company

The most talked of man in Montreal these days is E. A. Robert, president of the Montreal Tramways, who was recently elected president of the Quebec Railway, Light, Heat & Power Company. His prominence in the business and financial world comes from the fact that he has developed the Montreal Tramways into an organization unique on this continent. While most public utility companies have during the past ten years found themselves in rather straitened financial circumstances, from a combination of causes, and while in many cities a state of public opinion has grown up which is inimical to the success of such enterprises, Mr. Robert has not only emerged from the war period with his company in splendid financial shape, but public opinion within the sphere of the company's operations is such that residents of Montreal openly boast of the service provided.

When the war broke out the company was face to face with the greatest problem in its history—the problem of obtaining a new franchise. For some years agitators had been at work in Montreal, as in many cities in the United States, trying to stir the public up to blocking the legitimate demands of the company and to favoring the municipalization of the system. But these agitators found two obstacles in their way: First, the inherent distrust of the people of Quebec Province to public ownership, with all its attendant inefficiency and heavy taxation; secondly, the fact that the Montreal Tramways system had, under the Robert régime, been run with such splendid operating efficiency and such regard for the comfort of its patrons that the public felt it would be nothing short of disastrous to take the system out of its hands and turn it over to inexperienced operators.

Before the comprehensive plan could be adopted that had been worked out for keeping the facilities of the company abreast of the growth of the city, it was necessary that the company should be assured as to the terms under which it could operate in the future, and until a new franchise was made this matter would remain in doubt. Therefore only such routes were decided upon for construction as were imperative. The main effort of the company was directed to improving the operating capacity of the existing lines, and this was done by a progressive rearrangement of running schedules and by enlarging the capacity of the cars themselves, but the changes were made only after a comprehensive study had been made by officials of the company of practices in cities elsewhere.

About seven years ago Montreal civic officials were approached regarding the granting of a new franchise to the company. There was some opposition to the granting of a new one until the expiration of the old one in 1922. After considerable controversy, without any result, it was decided to refer the matter to the Quebec Legislature, which body, after being assured of the

E. A. ROBERT

support of both business and labor organizations in Montreal, appointed a special commission to draw up the terms on which to base a new franchise. The commission took the best part of a year to study the whole situation, with the help of the leading authorities on the subject, and after preparing the terms of the contract it was submitted to the Provincial Government. The proposals were adopted, with some minor amendments. The franchise is recognized as a model one in every respect, as it provides ample protection both for the city and the company. This franchise was adopted in 1918 and is working out to the thorough satisfaction of all concerned.

Every year for a long time past experts from all over the country have come to Montreal to inspect the system, and it is the general verdict that for comfort and efficiency the Montreal Tramways is in the first rank. The cars are clean, roomy, airy, splendidly lighted and comfortably heated in cold weather. In winter snowstorms, for which Montreal is noted, they run on schedule just as in summer, for the snowfighting equipment of the company is the last word in efficiency.

While Mr. Robert has made a success of the Montreal Tramways he has not confined his activities to this phase of business life. He first attracted public attention some sixteen years ago, when he undertook to enter the power field in Montreal by developing the water power of the Beauharnois Canal and distributing it in the vicinity of Montreal. His efforts at first were not taken very seriously, as there were powerful corporations occupying the field he proposed to enter. However, he soon demonstrated that he meant business, and from time to time in the face of strenuous opposition he moved from one success to another until to-day he heads a group of power companies that is rapidly becoming a factor not only in the city of Montreal but throughout many portions of the province. With the acquisition recently of the huge Carillon power, some 40 miles from Montreal, from which can be developed 250,000 hp., Mr. Robert becomes an outstanding figure in the hydro-electric power situation in Canada, especially as he proposes immediately to proceed with the consolidation of all the power plants under his presidency and the development of the Carillon plant.

About ten years ago Mr. Robert interested himself with the tramway and power situation in Halifax, N. S., and in 1917 formed the Nova Scotia Tramways & Power Company, Ltd., operating the tramway, light, power and gas services in Halifax and the adjoining city of Dartmouth. He resigned from the presidency of this company in 1919 in order to devote his entire time and attention to the more important tramway and power situation in Montreal and throughout the province of Quebec.

As another evidence of public appreciation of his ability and enterprise, he was during the past month offered the presidency of the Quebec Railway, Light, Heat & Power Company, which operates the street railway, light, power and gas systems in Quebec City and district. The invitation not only came from the executive and shareholders but from the citizens as expressed publicly by the Mayor. Mr. Robert's acceptance of the position means that the same aggressive policy he has displayed in Montreal in railway and power development will be applied to utilities in the city of Quebec.

Mr. Robert was born fifty-seven years ago at Beauharnois, Que., a village about 30 miles from Montreal, and has always been identified with the financial and industrial life of Montreal. He is a member of the leading clubs in Montreal and Quebec and sat for two parliaments in the Provincial Legislature.

Mr. Robert is president of the Montreal Tramways & Power Company, Montreal Tramways Company, Canadian Light & Power Company, Montreal Public Service Corporation, Beauharnois Light, Heat & Power Company, Imperial Trust Company and Quebec Railway, Light & Power Company.

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Commission on Interstate Traffic Appointed

Governor Edwards of New Jersey has appointed the members of the State Transit Commission, authorized by an act of the last Legislature introduced by Senator Smith, Passaic, for the purpose of bettering traffic conditions between the counties of Bergen, Essex, Middlesex, Morris, Passaic and Union in New Jersey and New York City. The members appointed are Walter M. Dear, Jersey City; Capt. Harry Hatcher, Hoboken; Herbert S. Swan, Glen Ridge; Spaulding Frazer, Newark; Archibald Cox, Plainfield; Bertran H. Saunders, Paterson, and Daniel A. Garber, Ridgewood.

The bill was introduced as a supplement to the Port Authority plan. It was the opinion that the traffic should be considered in co-operation with that development. The measure provided that the Governor should appoint seven commissioners for the purpose of making an investigation and then report a scheme whereby the conditions of travel in the area affected by the Port Authority would be bettered.

Pacific Electric Makes Changes

The title of T. J. Day, general freight agent of the Pacific Electric Railway, Los Angeles, Cal., has been changed to freight traffic manager, and the title of O. A. Smith, general passenger agent, changed to passenger traffic manager.

T. F. Sullivan Is Boston's Transit Chief

The Transit Department of Boston, Mass., has a new chairman in the person of Thomas F. Sullivan. Mayor Curley, in appointing Mr. Sullivan to succeed Edmund Billings, who resigned, said that he was "obliged to acknowledge merit." That recommendation from a political opponent places Mr. Sullivan ace high, for a prophet is usually not without honor save in the ranks of the opposing party.

Mr. Sullivan has held the responsible position of Commissioner of Public Works until recently. He laid out the first comprehensive plan of rebuilding radial highways from Boston to all outlying suburbs. More than that, he reduced the engineering and inspection forces in the city departments under his charge and established a system of promotion on merit, which eliminated political consideration entirely.

Long service with the Boston Elevated Railway has given Mr. Sullivan a concrete and valuable background for his work as chairman of the transit board. From 1899 to 1918 he was associated with different departments of the railway, serving first as clerk and timekeeper, later as chief clerk and assistant superintendent of tracks. From 1912 until he left the company's service to become Commissioner of Public Works he was roadmaster. He assumed his latest position on April 1.

Louis K. Rourke, formerly Commissioner of Public Works, and Francis E. Slattery, with Mr. Sullivan, make up the personnel of the transit commission.

Mr. Sullivan served in the Santiago campaign during the Spanish-American War and commanded the Tenth Regiment, Massachusetts State Guard, during the European War.

Four Philadelphia Changes

Four appointments have been announced by the Philadelphia Rapid Transit Company, effective April 15. F. W. Johnson becomes assistant to the president. He will continue as editor of "Service Talks." R. T. Senter is appointed assistant to the president on special assignment, E. J. McIlraith superintendent of Rolling Stock and Buildings Department and J. H. M. Andrews superintendent of the Way Department.

K. Y. Abe, chief engineer of the Tokyo Underground Railroad of Japan, is in the United States studying examples of tunnel construction. His company is planning the construction of a 10-mile tunnel under Tokyo's main street. The construction of the Japanese tube will be through sandy soil. Mr. Abe stated that the construction would cost $20,000,000 and would require five years to complete.

H. Flynn, auditor of the Georgia Railway & Power Company, Atlanta, has been appointed assistant comptroller. F. A. Brine has been advanced to the post of auditor. Mr. Flynn has been with the company for more than twenty years. Mr. Brine entered the company in 1901. George S. Jones, Jr., has been made commercial engineer and will have charge of the sale of electric power.

T. C. Berkeley of the English Electric Company is now in the United States and Canada studying rolling stock and fare practices. Mr. Berkeley arrived October last from England and has been engaged since then as specialist for the Toronto Transportation Commission in addition to having charge of the installation of Dick-Kerr electrical equipment on the Toronto system for his firm. He is also engaged in electrical work for the Ontario Hydro-Electric Commission. His headquarters are at 319 Transportation Building, Montreal.

W. J. Baldwin, assistant general manager of the New Orleans Railway & Light Company, has taken up his new work as director of public information for the Alabama Power Company, Birmingham. Mr. Baldwin has had newspaper experience as reporter for various papers in Georgia cities, and for some time owned and published a weekly paper at Hurstboro, Ala. The New Orleans *Daily States* said, upon Mr. Baldwin's departure, that "during Mr. Baldwin's connection with the railway company here, he displayed marked executive ability. His sound judgment contributed largely toward unraveling some of the perplexities which sprang up from time to time in the operation of the properties at New Orleans."

Obituary

William Howard Watson, for many years treasurer of the old Buffalo Street Railway, Buffalo, N. Y., died recently. He was 73 years old. He also had been treasurer of the Bell Telephone Company.

Leslie Richards, superintendent of the Bloomington & Normal Railway & Light Company, Bloomington, Ill., died recently. Mr. Richards was a car operator for eleven years before he became superintendent.

Robert Brisbane, senior construction superintendent for the J. G. White Engineering Corporation, died in New York, N. Y., recently. He was in charge of the construction of the station of the Radio Corporation of America at Bolinas, Cal., which was completed a short time ago. Mr. Brisbane came to America in 1906 from Scotland.

H. F. Beakey, chief of the secret service of the Interborough Rapid Transit Company and New York Railways Company, New York, N. Y., died recently. Mr. Beakey was chief of the secret service of the old Manhattan Railway from 1896 to 1902, later taking charge of the watchmen for some time. Mr. Beakey became chief of the secret service department of the New York Railways when it was formed in 1912 and took over the Metropolitan Street Railroad.

Major Thomas B. Lee, a leader in the field of civil engineering in the South, died at his home in Charlotte, N. C., March 13, 1922. His age was 87 years. Major Lee was in active practice of his profession up to the time of his death, and as a construction engineer had been connected with some of the largest and most important undertakings in the South. He was born at Camden, S. C., and was educated at the Citadel, Charleston. After his graduation he had his first practical experience in railroad construction with the old Blue Ridge Railroad from Anderson, S. C., to Knoxville, Tenn., in 1865. He had charge of the construction of the Seaboard Air Line Railroad from Monroe, N. C., to Atlanta, Ga., which line he subsequently extended to Birmingham, Ala. He concluded the last section of this work in 1905. Shortly after coming to Charlotte in 1905, Major Lee became actively associated with his nephew, W. S. Lee, vice-president and chief engineer of the Southern Power Company. In 1910 he became chief engineer of the Piedmont & Northern Railway and had charge of construction of this road from Charlotte to Gastonia, N. C., and from Spartanburg, S. C., to Greenwood and Anderson in that state. On the completion of this work he resumed his private practice, which he continued until his death.

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Boulevard from El Cajon Avenue to Mission Cliff gardens; East San Diego line in two sections, first on University Avenue from Park Boulevard to Thirtieth Street and second from Thirtieth to Daley; National Avenue line from Sixteenth Street and Market to the end of the line.

Duluth (Minn.) Street Railway Company has begun the relaying of its tracks on Superior Street. Seven-inch 93-lb. rail will be used with oak ties laid on a broken-stone foundation. Screw spikes with steel tie plates will also be used, and the joints will be welded by the Thermit process.

Muskogee (Okla.) Electric Traction Company will provide transportation to the bathing beach at Honor Heights this spring and summer. Surveyors are at work on plans for running tracks from the end of the West Broadway line to the site of a $500,000 soldiers' memorial hospital, and this line will be extended about two blocks further for patrons of the bathing beach.

Knoxville (Tenn.) Railway & Light Company has agreed to move its tracks to the middle of Central Street between Scott and Morelia Avenues at its own expense. The City Commission in return has agreed to grant a right-of-way franchise similar to the existing one. The question of paving between the rails of the new track will be settled later. The company also agreed to rebuild its tracks on Park Avenue from Gay Street to the viaduct and will pave between the rails of each track and between the double track.

Cincinnati, Ohio.—The Board of Rapid Transit Commissioners, has awarded the contract for constructing section five of the rapid transit loop to the Hickey Brothers, Columbus, Ohio. The Hickey Brothers were awarded the contract, although their bid was $12,823 higher than that of the lowest bidding company, but members of the commission said that their bid was the best. The lowest bid came from the J. T. Adams & Winchell Company, Columbus, Ohio. The Hickey Brothers' bid was $323,680 while the engineer's estimate was $399,635.

Trenton, N. J.—The State Public Utility Commission has denied the application of the City of Trenton, N. J., to compel the New Jersey & Pennsylvania Traction Company to lay additional tracks on West Hanover Street, to relieve congested traffic and alleged consequent danger to the public. The board said that much of the straight track and some of the special work soon must be reconstructed. Then the proper rearrangement can be made. The board said that the existing conditions were not sufficiently dangerous to justify the necessary expenditure for making the proposed change at this time, particularly in view of the financial condition of the company. The city's estimate of the cost was $38,236.40, plus 20 per cent for contractor's profit. The company's estimate was $75,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has started on its program of extensions by the replacing of special work at East Water and Michigan Streets. This job consisted of the placing of a new double track crossing with connecting curves on the southwest and northwest corners and is done to permit the rerouting of the Vliet Street cars, which are now operating by way of Third Street, Sycamore, Michigan and East Water Streets to the South Side, returning the same way. In this program of replacements will be the rebuilding of the curves and tracks at Reed and National, at West Water and Grand, and at several other important corners. It is also planned to extend the Center Street line from Sherman Boulevard to Fifty-first street, with a double track. The new work at East Water and Michigan Streets will cost some $35,000; that at Reed and National, about $50,000; that at West Water and Grand some $40,000 and the extension of the Center Street tracks about $40 000 without paving.

Shops and Buildings

Harrisburg Railways Company, Harrisburg, Pa., is installing two new Heine boilers with high furnace combustion chambers and Cox stokers, made by the Combustion Engineering Company.

Columbus, Delaware & Marion Electric Company, Columbus, Ohio., will spend $500,000 in improvements at the new power plant in Scioto, 7 miles south of Marion. The plant originally cost $1,000,000.

New York, N. Y.—Nine bids have been submitted to the Transit Commission in connection with the construction of additional stations and elevators on the Brooklyn-Seventh Avenue subway line, the Fourteenth Street-Eastern line and the miscellaneous work on various rapid transit lines. The highest bidder was George Colon & Company, $235,109. The lowest bid received was submitted by Joseph S. Brown, $207,792.

Wilkes Barre & Hazelton Railway, Hazleton, Pa., has been asked to arrange for the work necessary on switches and sidings from its line to connect with a new million dollar substation at Ashley Plains which will be put up by the Pennsylvania Power & Light Company. This substation will step down the high-tension current delivered by the Harwood power house to Wilkes-Barre. Work on the high-tension line has already been started.

Municipal Railway of St. Petersburg, Fla., will be driven by municipal current if the recommendations of a committee appointed by the City Commission are carried out. The committee has returned from a tour of Florida's municipally-owned power plants and has gone into the St. Petersburg situation with prospects for added demands due to the growth of the street railway. It advises the building of a 1,500 kilowatt plant immediately to furnish power for the municipal enterprises—street car line, gas plant, waterworks and street lighting—upon expiration next January of the present contract with the St. Petersburg Lighting Company. With this view in mind an electrical engineer has been called in to go into the situation and report to the commission, which is willing to call an election for bonds up to $300,000 for such plant. C. T. Baker is the consulting engineer who has been secured.

Oregon Electric Railway, Portland, Ore., has placed an order for automatic substation equipment, said to be the largest single order for automatic equipment of this kind ever placed in this country. Seven stations at present manually operated will be equipped with synchronous converters. These stations, which have been in operation since 1912, range in capacity from 500 to 1,000 kw., and generate power for the 180 miles of interurban system of the company at 1,200 volts, direct current. The automatic equipment will include separate exciters for the synchronous converters to insure correct polarity at starting and will be designed along standard lines for present railway practice. The equipment at each station will consist essentially of a motor-driven drum controller, exciter, contactors, switches and relays with protective devices and load-limiting resistors. The stations will be cut in on the line or shut down according to the demand for power, which will vary with the number of cars operating on the line.

Trade Notes

Johnson Fare Boxes.—The Chicago Surface Lines has arranged with the Johnson Fare Box Company for a trial installation of fifteen electrically driven fare boxes. These are of a new design providing instantaneous registration.

The Ohio Brass Company, Mansfield, Ohio, states that its cars will be used O. A. Lawrie as district sales manager in the New England territory with headquarters in Boston. For the past sixteen years Mr. Lawrie has been with the American Copper Products Company.

The Westinghouse Electric & Manufacturing Company has received an order for 50,000 suspension insulators from the Southern California Edison Company, Los Angeles, Cal. The insulators will be used in the reinsulation of 275 miles of high-tension line, to increase from 150,000 to 220,000 volts.

Differential Car Company, Findlay, Ohio, states that its cars will be used in Cleveland and Toronto this summer for hauling wet concrete from a central mixing station. Experiments made in Cleveland last fall indicate that the character of the concrete is not changed in transporting even with a maximum elapsed time between the mixer and ground of eighty-three minutes.

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Western Electric Company, New York, N. Y., announces the appointment of Edward B. Craft as chief engineer. This appointment is the result of a reorganization of the administrative department by which the operating functions are divided among four major departments. Dr. F. B. Jewett, vice-president of the company, has charge of the telephone department; vice-president H. A. Halligan has charge of the purchasing, traffic, legal, accounting, treasury and publicity personnel; F. A. Ketcham, general sales manager, takes charge of the supply department, and G. E. Pingree, vice-president and general manager of the International Western Electric Company, has the foreign department.

Wagner Electric Manufacturing Company, St. Louis, Mo., is advertising the Pow-R-Full Motor, which provides a pull box as a part of the motor frame into which the leads of the motor extend. The box may be turned in four directions for conduit connections. The advertisements of the motor accentuate the fact that vibration has been very largely eliminated and that the motor runs quietly.

Dutchess Bleachery, Inc., Wappingers Falls, N. Y., announces that its insulation division has taken over the sales of its products which were formerly sold through American Di-Electrics, Ltd. The new coating plant at Wappingers Falls has a present capacity of 2,000,000 yd. per year, which includes varnished fabrics of all standard gages and widths. Additional equipment is in the course of construction.

Westinghouse Electric & Manufacturing Company has separated the divisions of power and railway at the Pittsburgh office, and some new appointments have been made. Barton Stevenson, who previously was manager of both divisions, will continue as manager of the power division. F. G. Hickling has been appointed manager of the railway division, and S. R. Shave will act as manager of the price section for both divisions.

Combustion Engineering Corporation, New York, N. Y., has recently completed arrangements with the Power Plant Equipment Company, Kansas City, Mo., whereby that company will represent the corporation in that territory which covers, in a general way, eastern Kansas, eastern Nebraska, western Arkansas, and western Missouri. This district was taken over by the Power Plant Equipment Company on March 1, 1922. The Kansas City address of the Combustion Engineering Corporation is 1002 Coco-Cola Building.

Ford, Bacon & Davis, New York, N. Y., a firm of specialists in engineering and management of public utility and industrial business, outlines the facilities at hand and scope of service it is prepared to render in a booklet just issued. The company handles investigations, reports and valuations, organization, financing and development, engineering designing and planning, construction, accounting and management. Another booklet describes the United States Army supply base at New Orleans, La., which the company is constructing.

Roller-Smith Company, New York, N. Y., announces the following changes in its sales organization: The Perkins-LeNoir Company, which formerly represented the Roller-Smith Company in Philadelphia, has been succeeded by Esherick & Hoyle, Otis Building, who will handle the company's line of electrical instruments, meters and circuit breakers in the Philadelphia territory. The Perkins-LeNoir Company, which formerly represented the Roller-Smith Company in Baltimore, has been succeeded by J. E. Perkins, 113 E. Franklin Street, who will handle the company's line of electrical instruments, meters and circuit breakers in the Baltimore territory.

Railway Audit & Inspection Company, Philadelphia, Pa., has announced the following officers for this year: E. C. Hathaway, chairman of the board; H. N. Brown, president; T. C. Cary, first vice-president and general manager; C. H. G. Larrimore, assistant general manager; C. E. Horney, second vice-president and treasurer; George W. Reif, secretary. The field covered by the company was divided as follows: K. H. Wendling, managing central division; I. F. Heidler, supervisor central division, Frick Building, Pittsburgh, Pa.; W. B. Edwards, assistant manager central division, Perry-Payne Building, Cleveland, Ohio; P. H. Diehl, manager western division, Webster Building, Chicago, Ill.; F. W. Stockmar, assistant manager western division, Railway Exchange Building, St. Louis, Mo.; Harry Preston, manager southern division, Candler Building, Atlanta, Ga.; J. P. Graham, district manager, Drovers & Mechanics National Bank Building, Baltimore, Md.; J. H. Cain, district manager, Little Building, Boston, Mass.; C. E. Harbison, district manager, Candler Building, New York City, N. Y.; L. D. Rice, district supervisor, Brown Brothers Building, Philadelphia, Pa.

New Advertising Literature

Schutte & Koerting Company, Philadelphia, Pa., has issued a flyer showing the straightway valve being marketed by that company.

Westinghouse Union Battery Company, Swissvale, Pa., has issued Bulletin No. 1102 descriptive of its radio batteries and Bulletin No. 1201-A descriptive of its storage batteries for farm lighting.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has published a folder on Shurvent fuses. The folder explains the application and design of fuses for the protection of low-voltage circuits up to 600 volts for both alternating and direct current.

Heine Boiler Company, St. Louis, Mo., is distributing a reprint of a message from C. R. D. Meier, president of the company, to Heine boiler salesmen. This contains a discussion on present business conditions and includes diagrammatic curves of wholesale prices in the United States for 110 years.

Electric Railway Equipment Company, Cincinnati, Ohio, has issued a folder giving construction details and installations of Elreco combination railway and lighting poles, and ornamental brackets. A list of cities which have these in use is given, together with illustrations of the completed installations.

Heine Boiler Company, St. Louis, Mo., has issued a folder entitled "Forty Years of Progress." This contains information on several new developments in boiler design and announces a change in the name of the company which was previously Heine Safety Boiler Company. The change consists in dropping the word "Safety."

Ingersoll-Rand Company New York, N. Y., has issued bulletin describing the Price type "PO" horizontal single cylinder oil engine. One of the outstanding features of these engines is the shape of the combustion chamber and the arrangement and construction of the spray nozzle used for direct-injection of fuel.

The Page Steel & Wire Company has just issued a new handbook giving information on Page-Armco welding rods and electrodes. This gives information on the various products manufactured, the sizes, weights, etc., together with specifications for welding rods and electrodes as issued by the American Welding Society, and tests for welding electrodes.

Uehling Instrument Company, Paterson, N. J., has recently issued Bulletin 112, covering Uehling CO_2 recording equipment, for guiding the engineer and fireman in reducing the waste of fuel up the chimney. Features are the separate recorder for the engineer's office and indicator for the boiler front, continuous chart record and dry method of absorption.

Atlas Valve Company, Newark, N. J., is distributing a small booklet giving information on reducing-valve economy. Information is given on the flow of steam through pipes, together with handy tables for determining the size of pipe needed. Information is also given on superheated steam, extra heavy pipe, pipe fittings, leaders to heating systems, pipe friction allowances, and steam velocities.

Westinghouse Electric & Manufacturing Company has just published some electrification data in Vol. III, No. 2, of its *Data* publications. This points out the value of electrification of railroads as a means of conserving energy and contains information regarding desired standards for railroad electrification and discussion as to the future of railroading and existing electrifications.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Volume 59 — New York, Saturday, May 6, 1922 — *Number* 18

To Eliminate Waste in National Electrical Associations

ONE of the important lines of research undertaken by engineering associations within recent years has been the study of methods for eliminating waste in industry, conducted by the Federated American Engineering Societies last year. The task was one peculiarly suited to an organization representing the leading engineering societies because engineers are trained by long experience in the collection and study of statistics to secure economy of output in the undertakings in their charge.

The consideration of methods to reduce waste by the Federated American Engineering Societies is mentioned in these columns again because of the very similar plan now being initiated by the Society for Electrical Development to eliminate waste or duplication in the activities of the various national electrical associations. Such an effort is a very desirable one. Americans are often spoken of by European observers as a nation of "joiners." There are in this country innumerable national and sectional organizations of people engaged in the same trade or profession; of people with the same interests in educational, literary, religious and social life; of people living in one city who have been born or reared in some other part of the country, people whose ancestors fought in the same early war, people with the same surnames, people with the same physical or corporeal attributes, such as fat men's clubs and bald men's clubs.

Associations and societies in engineering and its allied lines of business have grown up in somewhat the same way. Perhaps two or three men who believed that mutual benefit would be obtained by the association of themselves and others with the same idea or ideals have formed an association. With these heterogeneous beginnings, there is no doubt that without co-ordination of purpose there must be considerable overlapping, and there are probably instances of lack of efficiency even where actual overlapping does not exist. As each society has been largely a law unto itself, feeling no responsibility except to its own members, it is almost inevitable that such a condition of affairs should exist. If so, it is logical that the national engineering societies, and especially the electrical societies, should take the lead in effecting a reform.

While each society or association has its own purposes, there is a common purpose to all, namely, to advance the interests of its members in the most economical way, by legitimate means, so that any steps toward the elimination of waste in the work of these associations should be welcomed. Another and added reason is that in a sense each organization is acting in a trust relation to its members. The acceptance from them of dues is equivalent to an agreement by the society that these dues will be spent in the way most efficiently to carry out the purposes of the organization and for no other purpose. Here is an additional reason for such a co-operative study.

The representatives for this undertaking appointed by the executive committee of the Society for Electrical Development are men of extended experience in electrical as well as in association work, and good results may be expected from their mission if the other national electrical associations accept the invitation to participate. They should do so.

180 Reasons for Being Cheerful

ONLY one conclusion can be drawn from the figures of operation of 180 electric railways compiled by the American Electric Railway Association for 1921. It is that the processes are being accelerated by which the electric railways are coming back. The improvement as shown by the figures is more pronounced for the city lines than for the interurbans, but this is quite natural, for the interurbans have been beset lately by certain conditions that do not apply to the purely urban system. This condition is gradually righting itself and will be speedily corrected as the interurbans recover the business that has been lost to them through the curtailment of freight and express shipments.

The most promising sign of the times as reflected in the figures is the reduction in the operating ratio. This is not very pronounced, but it indicates the start that has been made both in the deflation of labor and of the cost of material and supplies. Another promising factor is the gradual lessening of the interest rate for money. Within the last few years only such financing has been done as was imperative, but the time now is ahead when work previously put off may be carried out with money secured at reasonable rates. This will permit betterments to be made that will make possible the handling of present and future business to greater advantage and at relatively smaller costs.

There are many problems ahead to be solved, but the period since the war has shaken the industry out of its lethargy and taught it lessons in economy which will be of the greatest help in the future. To some executives it may seem that the enforced pruning processes were emergency measures of the hour, from some of which they will be glad to be free in the future. There is no doubt that recourse had to be made to a few measures that were distasteful and of a temporary nature, but there are others that have left an imprint that will be handed down in the future to the lasting benefit of the industry.

The natural and easy thing is to be profligate. Stern necessity is, however, a good teacher. The salutary effect of the period through which the industry appears now to have passed will probably remain for all time. When all the onerous conditions are considered which were imposed on the industry during the war-time

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period it is to be wondered that the electric railways have come through as well as they did. That the record of the past few years was not worse is, indeed, a striking tribute to the industry and resourcefulness of operating officials everywhere.

Study of Car Ventilation Is Much Needed

PERPLEXING indeed is the problem confronting the railway engineer if he starts out in earnest to determine what is a thoroughly satisfactory system of car ventilation. Perhaps there isn't such a thing. But certainly there is a great diversity of opinion on the subject, and this opinion is often based on elaborate tests—at least they seemed so at the time made. The editors of this paper tried last fall to agree on an editorial on what constitutes good ventilation and on its relation to car roof design, but were unable to harmonize their views and experience. At the convention they noted the similar divergence of opinion as expressed by various railway engineers. Since that time, at least one very able car design engineer, who had previously convinced himself of some definite ideas on the subject, has studied and investigated extensively, with the result that he has acquired a very substantial doubt about his former beliefs without being able to reach a more satisfactory view as to a real solution of the question.

At present there seems to be a general floundering on this subject. Nor is the absence of definite knowledge on ventilation confined to the electric railway field. One important steam road has changed back from an arch roof design to its older monitor-deck construction on account of ventilation, but more recently decided again on the arch roof for equipment to be purchased in the near future. One of the largest builders of steam road passenger cars admits it has not been able to find a wholly satisfactory ventilating system, though its construction is confined almost entirely to the monitor-deck type roof with which some consider it easier to ventilate.

Perhaps it actually is an impossibility to meet all the ramifications of conditions in attempting to provide a system that will be free from complaints. One person must feel cool, fresh air in his nostrils or the car is stuffy, while another will complain of drafts under this condition. Ventilators must take in or exhaust enough air at low speed and not too much at high speed. They must function in rarefied air or in heavy damp air. A passenger or two must have the window open and the ventilators must provide the right amount of air whether these windows are open or all closed tight. Then there is the uncertainty, with some types of ventilators, resulting from failure of the trainmen to make the right adjustment of shutters.

In high-speed interurban service with modern steel cars well equipped with weather strips and double windows, and the body tight everywhere to eliminate all drafts and obtain good heating, one of the common faults is that the exhaust ventilators cannot function because not enough air is admitted to the car interior. The installation of sufficient intake ventilators so that the exhaust ventilators will have something to draw out without trying to reduce the interior air pressure below atmospheric seems to introduce objectionable drafts. The principal problem among many, in this particular case, is therefore perhaps the introduction of adequate air without the passengers knowing it. An additional one is that of heating this air input in winter.

These things point to the great desirability of extensive study and experimentation on ventilation methods and devices, their design and location in a car, and the relation of roof design to the ventilation problem. This is particularly needed in connection with interurban equipment. About eight years ago many manufacturers were active in developing ventilating methods and equipment, but there has been a notable absence of further development work on their part since the war. Surely this is a subject which demands prompt and comprehensive treatment, for the tendency to change from arch roof to monitor deck, or vice versa, with changing personal conviction, is something to be avoided. If for no other reason, trains made up of cars with these two kinds of roof look badly, and flexibility of operation is limited if an attempt is made to keep cars of the same type together. Perhaps the way to start a study of this problem is to come to an agreement on what is the proper amount of air per passenger per hour to introduce into and exhaust from a car. With this determined, the next step would be to decide on the most effective and satisfactory means of accomplishing this end under average conditions. The extreme conditions, it would seem, will have to be taken care of by some special arrangement.

New Orleans Compromise Agreement a Wise Move

MAYOR McSHANE of New Orleans appears to be the only outstanding figure interposing any objection to the plan for the reorganization of the New Orleans Railway & Light Company under the agreement just approved by the Council of that city. The settlement is a compromise. City Commissioner Maloney, who has taken a prominent part in the negotiations leading up to the settlement, saw this as the only way out. The courts had sustained the rights of the city to the rate-making power, but Mr. Maloney and the four other members of the commission realized that in the last analysis a rate cannot prevail that is confiscatory and that any attempt by the city to impose unduly burdensome rates could only result in prolonging litigation. In the event of resort to the courts, Mr. Maloney felt none too certain that the city would not lose concessions which it has now secured under the proposed new amicable arrangement. That, in short, has been the basis on which he has waged his campaign for the acceptance of the new terms. As for the company, it has agreed to a rate base value of $44,700,000 plus additions subsequent to December, 1920, as against $71,000,000 of outstanding capital liabilities, and a value of $56,000,000 fixed by the company's engineers as reproduction cost on the basis of average prices over a five-year period. The railway department starts with a 7-cent fare, this rate to continue for one year.

It seems to be pretty generally agreed that the interests of both the city and the company are protected for the future, with the city standing to gain very largely through the money that will be put back into the property for improvements and betterments. It is quite unlikely that the city would have done nearly so well had it insisted upon fighting the issues out through the courts. Even authorities with no immediate interest in the terms of the settlement agreed with Mr. Maloney and his fellow commissioners that this was so.

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LOOKING NORTH ON PEACHTREE STREET TO FIVE POINTS, ONE OF THE MOST CONGESTED CORNERS IN ATLANTA

Transportation Developments in Atlanta

The Combination of Narrow Streets, High Buildings and Many Automobiles Has Made Necessary Up-to-Date Methods of Reducing Street Congestion—Extended Consideration Has Also Been Given to the Engagement and Training of Employees and the Promotion of Traffic

ATLANTA is the second largest city in the Southern States, ranking next to New Orleans in population, and is often referred to as the "gateway" of the South, because of its importance as a railroad center. Its population in 1920, according to the United States census, was 200,616, as compared with 154,839 in 1910 and 89,872 in 1900. This is an increase of about 30 per cent in the last ten years and 123 per cent in the last twenty years.

The transportation problems in the city have always been complicated because of the narrowness of the principal streets, and the situation has naturally become more acute in recent years because of the great increases of population and the construction downtown of many tall buildings. The city has now a city planning commission, to which Robert H. Whitten of Cleveland and New York has made a report recommending zoning and the construction of certain boulevards and viaducts. These improvements may help the transportation situation, particularly in the newer parts of the city. At present the downtown streets are very congested and hardly able to carry the volume of traffic which passes through them and there is crying need for some relief. Peachtree Street, the principal business thoroughfare of the city, is only about 35 ft. wide between curbs in the downtown section, and with two lines of electric cars there is room for only a single line of automobiles on each side.

The city has done much to relieve this situation by the passage of ordinances which prohibit the parking of automobiles on the most congested streets where there are car tracks between 7:00 and 9:30 a.m. and between 4:30 and 7 p.m., and prohibiting parking on these streets for more than thirty minutes at other hours. The city has also traffic officers at the principal downtown corners and has recently installed a system of electric traffic signals with colored lights, to be operated by the traffic officer at the most congested point downtown, known as Five Points.

COMPANY HELPS REDUCE CONGESTION

The principal steps taken by the company to relieve the situation consist of the employment of a corps of traffic supervisors and inspectors in the congested area, the establishment of safety zones to facilitate rapid boarding, the limitation of the number and time of car stops in the most congested districts and the rigorous maintenance of time schedules.

The traffic supervisors consist of a selected body of about thirty men whose duties are to keep the traffic moving and to see that car schedules are maintained. Some of these supervisors have definite stations and others travel about the system. These supervisors are uniformed and have police powers so that they may make arrests, and they wear the police badge. During rainy weather those at fixed points wear white weatherproof caps and coats and white rubber boots so that as they stand on the corners or in the streets they will be conspicuous to the drivers and pedestrians.

As yet the company has not installed any loading platforms, but it has provided a substitute therefor by railing off safety zones by movable posts and ropes at the principal downtown loading points. The number of these points has been reduced to a minimum. Each stop, whether in the congested area or outside, is designated by a stop sign reading "Cars stop here" in white

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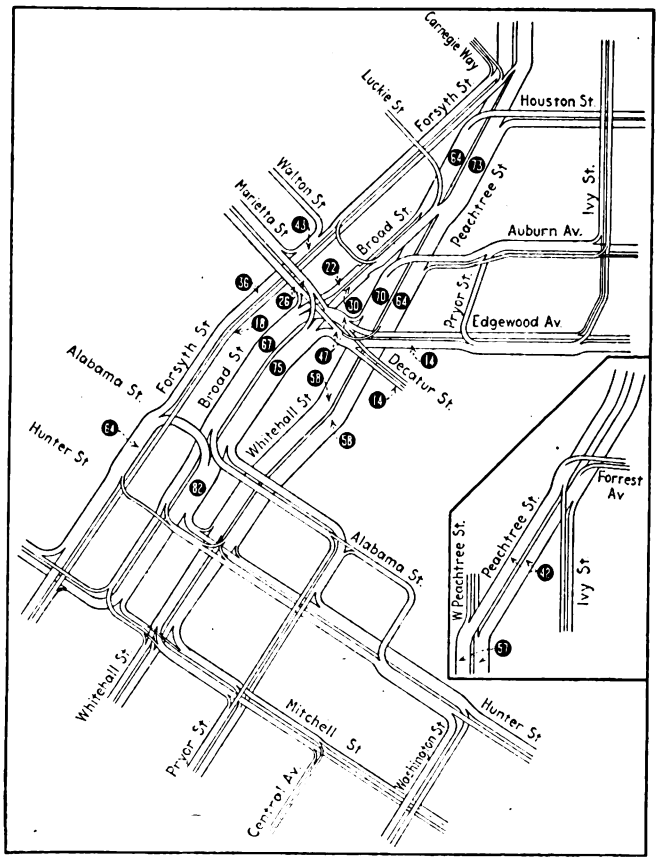


DIAGRAM SHOWING THE VOLUME OF CAR MOVEMENT THROUGH THE BUSINESS DISTRICT OF ATLANTA DURING THE MAXIMUM P.M. RUSH HOUR, JAN. 16, 1922

(The original diagram shows the number of cars on all lines. Only a few of these have been reproduced.)

letters on a blue background. It is carried either on the side pole or on the span wire itself. Rapidity of operation at the most used stopping points downtown is secured by a supervisor and a front-end collector who admits passengers into the front end of the car. About twelve loading points are covered in this way, some all day and some during the morning and evening rush hours only.

MAINTENANCE OF CAR SCHEDULES

An important duty of these men, in addition to directing traffic, is to see that there is a careful maintenance of time schedules by the car crews. The schedules are drafted by the transportation engineer, as will be described later. Each run is given what is called a "block number," and the schedule for each car with the time at which it should start from each terminal and pass various time points en route is typewritten and carried under transparent celluloid in a metal frame in the front cab where it is constantly within the vision of the motorman. The motorman and conductor carry standardized watches which are regulated free of charge by the company.

When a motorman starts out from the carhouse at the beginning of his run he procures from the starter a metal holder containing the timetable for that particular run and places it in the cab. He also gets from a rack at the carhouse two small plates showing the block number of his particular run and attaches one on the outside of the front cab and one on the outside of the rear cab.

The supervisors check the time of cars at a great many of the time points, in the following way:

Each supervisor has a small handbook with pages ruled as shown in the reproduction on page 744. Each double page covers a period of one hour with each horizontal line reserved for one minute. The left half of each single page is used for cars running in the inbound direction, and the right half of each single page is used for cars running in the outbound direction. A vertical column on each half of the page is reserved for each route running past the particular time point. All routes are numbered.

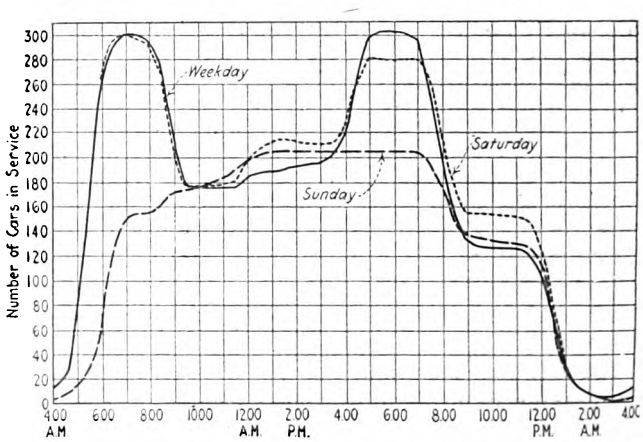
The book is then filled out so as to give, for the schedules in force, the time at which each car according to block number on each route should pass that point. It is necessary only for the supervisor mentally to check off the cars as they pass the intersection or time point, on time, as no writing is done on this handbook. If a motorman is late, he is warned either informally or officially, and reports regarding deviation from schedule are made up on special forms provided for this purpose.

At the terminals which inspectors can hardly be spared to watch the company is using a Nachod headway recorder to check in and out cars. It is very easy to determine with this recorder the time of arrival and departure of any particular car or crew. As yet only the principal terminals have been equipped with this recorder.

The company has its own telephone system connecting the terminals, carhouses and important traffic points with each other through a central in the main office, and all cars are dispatched by telephone. In case of blockade the nearest inspector has authority to turn back cars, reporting such action promptly to the chief dispatcher so that the latter may send out additional cars to maintain the proper headway.

Accompanying diagrams show the number of cars scheduled by thirty-minute periods through the day and the car flow diagram through the business section of Atlanta during the maximum afternoon rush hour of Jan. 16, 1922, the figures in circles showing the number of cars. Another chart shows a graphical method devised by the transportation engineer of the company to check traffic schedules graphically and if possible to trace the trouble to particular motormen.

This chart, of which a section only is reproduced, shows both the scheduled time and the actual time of cars on each of three days past the point of observation, which was the corner of Peachtree Street and Ponce de Leon Avenue. The scheduled time of cars is indicated by the upper vertical line in each case and the actual time by the lower vertical line of half the length of



NUMBER OF CARS SCHEDULED FOR OPERATION, DECEMBER, 1921, BY THIRTY-MINUTE PERIODS THROUGHOUT THE DAY

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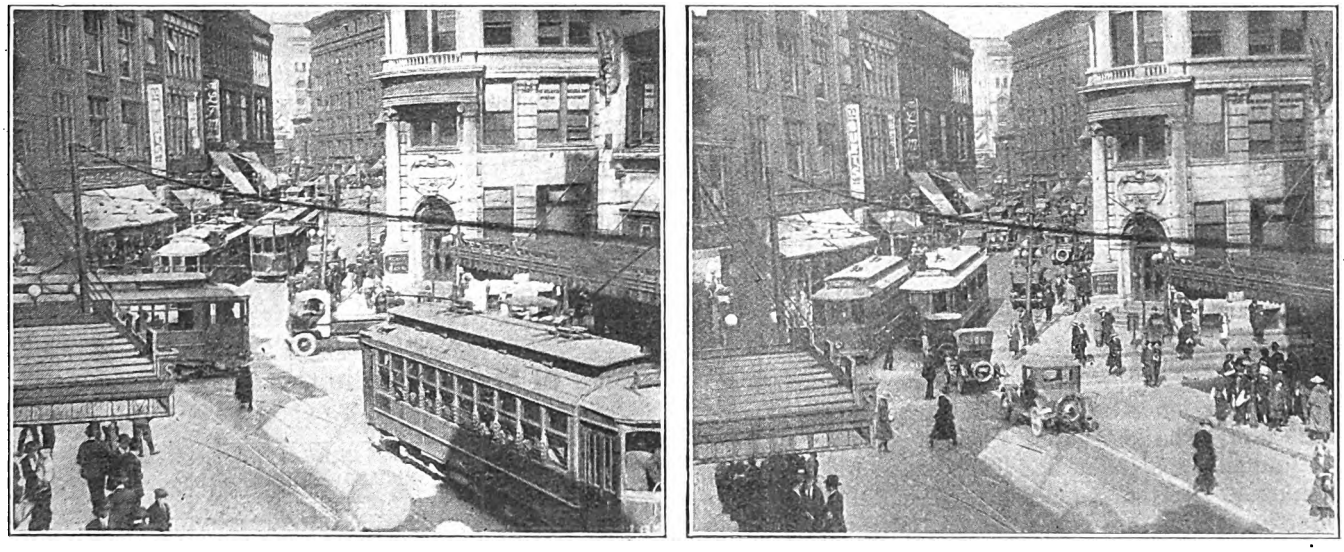
the upper line. Whenever a car is behind time, a dotted line connecting the scheduled time with the actual time and running at an angle inclines downward to the right. If the car is ahead of time, the line inclines downward to the left. Where there is no deviation from schedule, the dotted line is usually omitted.

This chart is not intended as a traffic study but purely as a time study of maintenance of schedule, and it has been found to be especially useful for detecting recurring deviations from schedules by the same block number or by cars operated by the same crew. Thus, in the chart shown, Block No. 5 will be found late on each of the three days charted, and in one case the crew apparently came back so late that the supervisor had to turn the car in the center of the city and put it on time again. A case of a car running ahead of time and disrupting schedule is that of Block No. 22 on each of the three days. This car is a tripper and runs only during rush hours. At 7:28 a.m. this car is due out-bound to follow Block No. 4, but the chart shows that it cut out Block No. 4 on each of the three days charted.



VIEW OF ALABAMA AND WHITEHALL STREETS INTERSECTION—LOOKING NORTH ON WHITEHALL STREET, SHOWING TALL BUILDINGS AND NARROW STREETS

For convenience in operation the railway system of the Georgia Railway & Power Company has been divided into three sections or divisions. A superintendent in charge of each division handles all matters of discipline relating to the men operating out of the carhouse in that division, but while the trainmen are operating cars they are under the supervision and direction of the superintendent of the division in which the car may be at the time.

ENGAGING EMPLOYEES

The employment office of the company is at the main transportation headquarters on Piedmont Avenue. Prospective employees are first interviewed by the superintendent of employment and if their appearance, bearing, etc., are satisfactory they are asked a few simple questions, along the lines of the mentality test used by the United States army during the late war. Each candidate is then asked to perform a few simple acts to denote his degree of alertness and is examined on colors, and if he passes these and a few other simple tests he receives an application blank to fill out.

This blank calls for the usual identification data in regard to himself, number of dependents, names and addresses of nearest relatives, whether employed previously by a utility, physical condition and state of health, whether having a trade or profession, if intoxicating liquors are used, if ever discharged from any position, if any relatives are employed by the company, if he has a financial interest in any business, if any claim for personal injury has ever been brought by him, if he has ever been required to give a surety bond, a record of his employment during the past five years, three references, not former employers, and if he has ever been convicted of a crime or misdemeanor. He is also required to sign at least six copies of an inquiry blank releasing the references from any liabilities for information given in regard to him. The application blank also contains the text of an agreement by the applicant expressing himself as willing to work ninety days on probation and allows the company to dispense with his services at any time during this probation period for general unfitness or without specific charge.

The next step is the physical examination. While this examination is not as extended as that which would be given by a life insurance company in so far as the latter might go back into the history of the applicant's family, it is very thorough and is based on the experience of the present medical examiner, who has spent many years in examining applicants for trainmen's positions. Besides the usual heart, lung and blood tests, and urinalysis, the test includes one of alertness of mind. This is considered helpful in determining the ability of the man to avoid accidents.

If these tests are passed successfully, a photograph is taken of the full face only. The profile is not considered worth the additional expense.

INSTRUCTION IS THOROUGH

Instruction is then given to the applicant in the instruction room on operating and safety rules, his duties in meeting the public, and his responsibility for creating favorable public opinion through his actions, general bearing, etc. This first instruction does not contemplate a detailed analysis and study of the rules, but it is believed that by a preliminary talk of this kind, when a man's mind is fresh and unburdened by the detailed instruction in store for him, the principles of the work will be more carefully remembered later.

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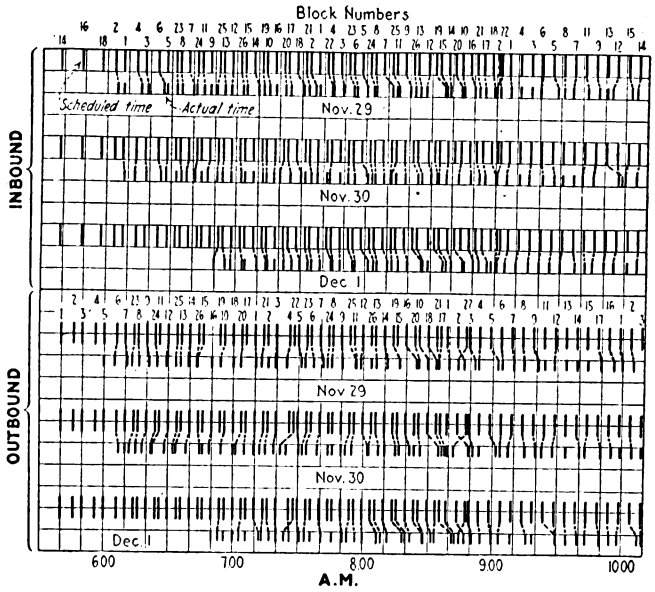
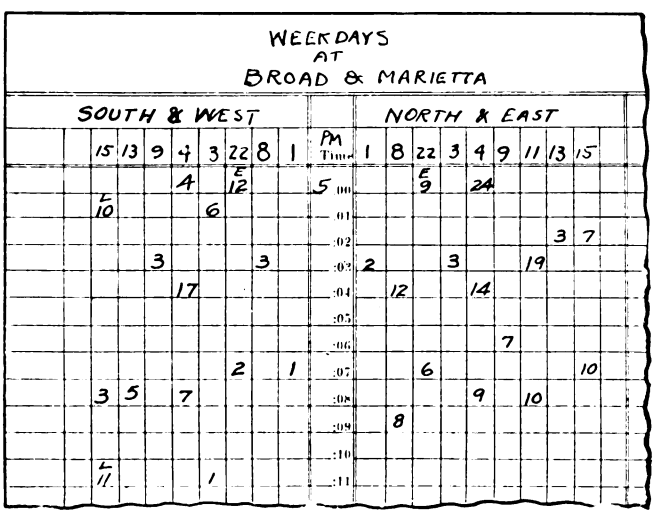


CHART SHOWING ACTUAL TIME OF CARS, CHECKED AGAINST SCHEDULED TIME, PEACHTREE LINE

The superintendent of employment and instruction then introduces the applicant personally to his training assistant and there is an effort to make him feel that these instructors are not drivers or grillers but are there to help and encourage him and to make him if possible the star man on his division. It is believed that here encouragement is especially necessary. The man also receives then his instruction book and badge.

A day is spent in the instruction room. It is thought that this is all that is necessary, since the applicant will be in and out of the instruction room frequently and may go over again any operation which may arise to puzzle him. The instruction room is equipped with the usual dummy controller stand and brake stand, with an illuminated chart of connections which shows the circuits through motors and resistance at different points of the controller, a typical air brake equipment, etc., for the motorman, and a register, blanks, etc., for the conductor. The candidate is then sent out on the road under the guidance of an instructor.

As already explained, the Atlanta system is divided into three divisions, each with a separate carhouse rather widely separated. The applicant is sent to one of these carhouses with a letter of introduction to the



UPPER PART OF PAGE USED BY TRAFFIC SUPERVISOR TO CHECK ACTUAL TIME AGAINST SCHEDULED TIME AT VARIOUS TRAFFIC POINTS

man with whom he will train. These instructors, who are selected motormen and conductors, receive 5 cents per hour extra for giving instructions. The applicant averages about two days on each route of the division on which he is working, being required to work on both the day shift and the night shift. It usually takes from fourteen to fifteen days from the time the applicant has his physical examination until he has completed his course of breaking in.

He then returns to the superintendent of instruction and employment for a written examination. The questions then given cover not only a general knowledge of car operation but have to do with such local knowledge of the lines as is essential to a proper conduct of the work. These questions, with the proper answers, are printed in pamphlet form, and a copy is given to the applicant beforehand. He is expected to memorize the answers so that when the questions only are submitted to him he can readily give the proper replies. In addition to this written examination, applicants are cross-examined on the rules, and a final talk is given to them on personal conduct, safety matters, accident prevention, etc. The man is then personally introduced to his division superintendent, who in turn introduces him to the division starter, to whom he reports each day for

EXTRA! EXTRA!

SNAP-SHOTS

PUBLISHED BY AND FOR THE WORKERS OF THE GEORGIA RAILWAY & POWER CO

Atlanta, Georgia, January, 5 1922

Plan of Service Annuities Announced For Employees of G. R. & P. Company

New Plan Becomes Effective From and After January 1, 1922

FOR the purpose of providing financial assistance for employees of the Company who, because of age or disability, are unable to continue in active work, and

READ PLAN IN FULL, MR. ARKWRIGHT URGES

THE ACCOMPANYING plan has been authorized by the Board of Directors, and makes provision for all employees of the company who may, because of age or disability, become unable to continue in active work, and whose long service justifies assistance from the company.

Provision Made for Age and Disability—Plan Announced in Full

UPPER PART OF EXTRA ISSUE OF "SNAPSHOTS" CARRYING ANNOUNCEMENT OF ESTABLISHMENT OF SERVICE ANNUITIES

duty. He is then put to work and is on probation for a period of ninety days from the day he was accepted for training unless released in the meantime.

At the end of his ninety days probationary period he is brought in for oral examination on rules, operating conditions, etc. This examination is very thorough and is intended not only to test the men but to smooth out any rough spots which may be confusing to them.

Up to this stage the man is considered, and is in fact, an "applicant," even if he may have been on the payroll of the company for some sixty days. His probationary period, however, is ended, and it is necessary for the company to accept him or reject him. If accepted he is assigned to a certain standing according to his proper seniority with regard to the other applicants and is then a full-fledged employee. If unsuitable, he is allowed to go, which the company is privileged to do with or without specific charge.

The wages paid all trainmen engaged by the company after Jan. 1, 1922, are 40 cents for the first year, 45 cents for the second year and 48 cents for the third year and thereafter. The maximum quoted is the same for all, but some employees engaged before Jan. 1, 1922, did not start in at the lower rate. Runs are made as

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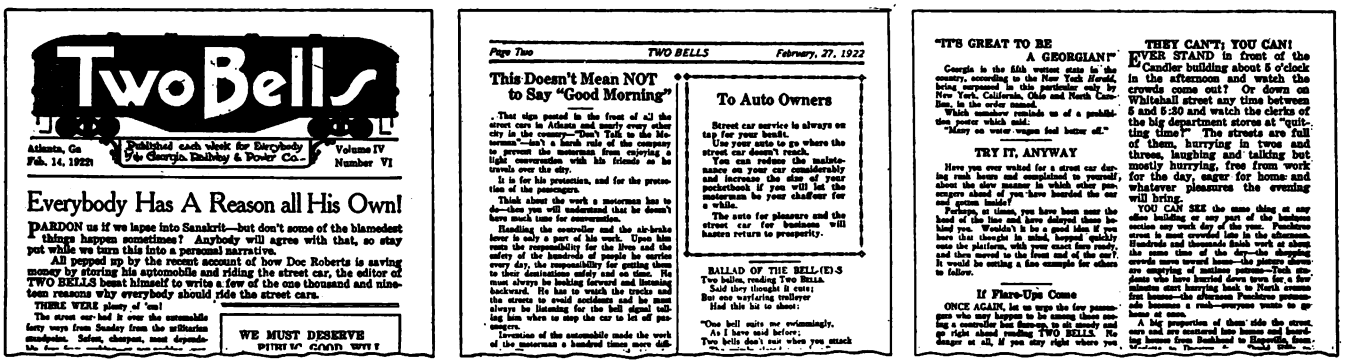


Two Bells

Atlanta, Ga. Feb. 14, 1922 — Published each week for Everybody by The Georgia Railway & Power Co. — Volume IV Number VI

Everybody Has A Reason all His Own!

PARDON us if we lapse into Sanskrit—but don't some of the blamedest things happen sometimes? Anybody will agree with that, so stay put while we turn this into a personal narrative.

All pepped up by the recent account of how Doc Roberts is saving money by storing his automobile and riding the street car, the editor of TWO BELLS beat himself to write a few of the one thousand and nineteen reasons why everybody should ride the street cars.

THERE WERE plenty of 'em!

The street car bed it over the automobile forty ways from Sunday from the utilitarian standpoint. Safer, cheaper, more dependable.

WE MUST DESERVE PUBLIC'S GOOD WILL

Page Two — TWO BELLS — February, 27, 1922

This Doesn't Mean NOT to Say "Good Morning"

To Auto Owners

Street car service is always on tap for your benefit.

Use your auto to go where the street car doesn't reach.

You can reduce the maintenance on your car considerably and increase the size of your pocketbook if you will let the motorman be your chauffeur for a while.

The auto for pleasure and the street car for business will hasten return to prosperity.

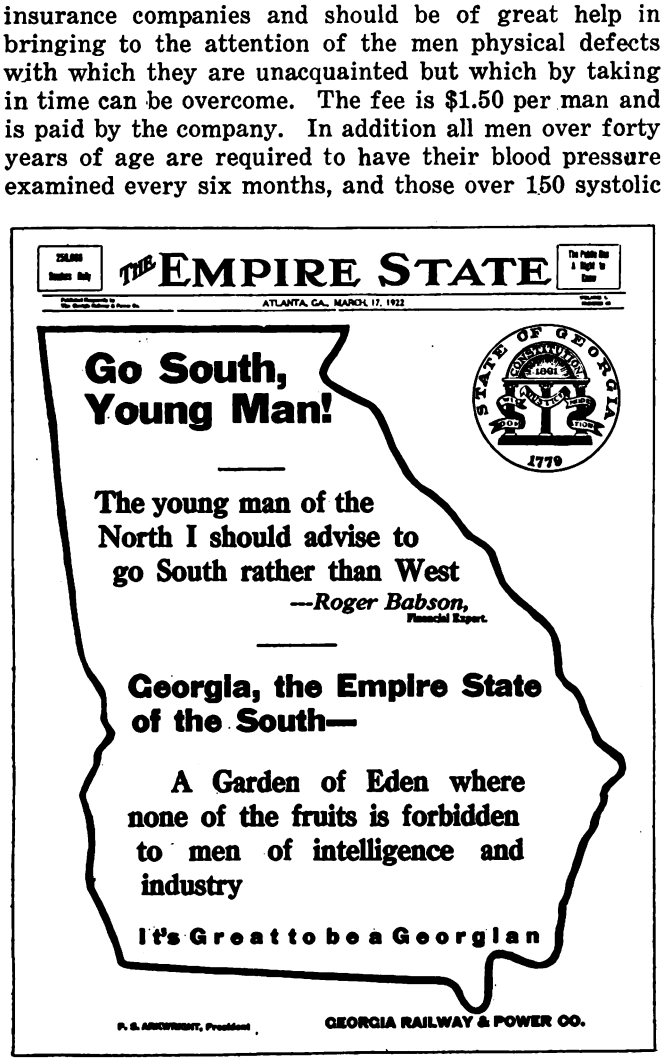
BALLAD OF THE BELL-(E)S

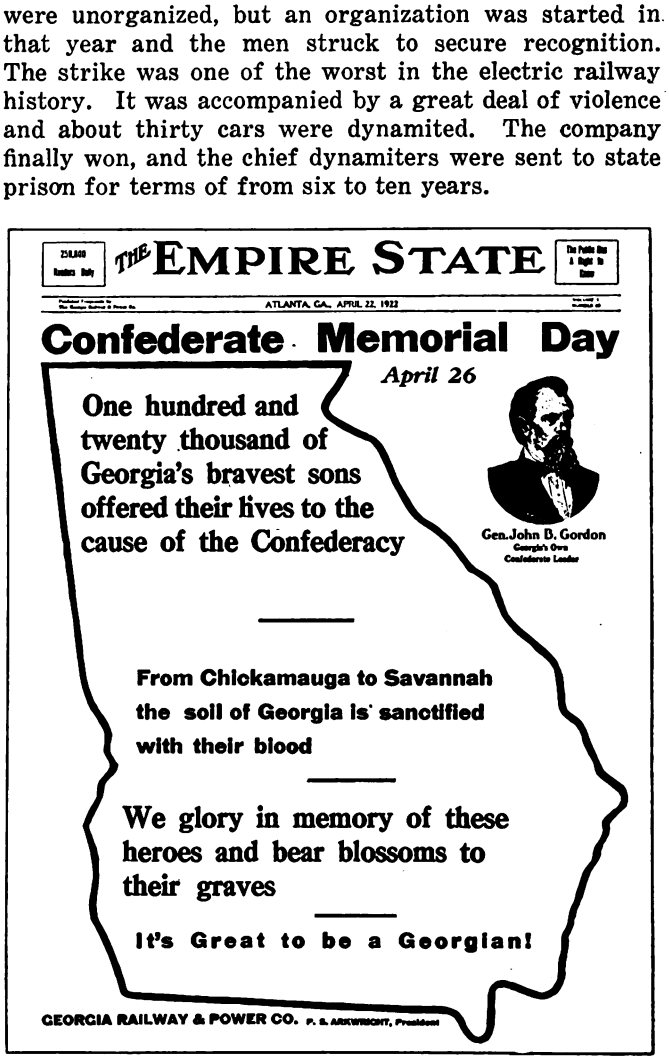
"IT'S GREAT TO BE A GEORGIAN!"

TRY IT, ANYWAY

If Flare-Ups Come

THEY CAN'T; YOU CAN!





TYPICAL WINDOW POSTERS CARRIED IN CARS TO ADVERTISE THE CITY OF ATLANTA AND THE STATE OF GEORGIA

near nine hours as possible. The extra list is rotated, and the upper 50 per cent of the men on the extra list are guaranteed five hours time. There is an effort, of course, to keep the extra list as small as possible.

RE-EXAMINATION OF EMPLOYEES IS SYSTEMATICALLY CARRIED OUT

The company makes an annual physical examination of all division superintendents, supervisors, motormen and conductors. Motormen and conductors are re-examined on the rules at least every five years. Those who fail to pass are required to undergo the training or instruction necessary to give them the knowledge required. The plan of a physical re-examination has just been adopted. It is based on the lines of examinations made by life insurance companies and should be of great help in bringing to the attention of the men physical defects with which they are unacquainted but which by taking in time can be overcome. The fee is $1.50 per man and is paid by the company. In addition all men over forty years of age are required to have their blood pressure examined every six months, and those over 150 systolic are required to take treatment. There is no charge for this blood pressure examination.

By these periodic examinations it is hoped to ward off disease from the men and loss to the company in accidents and damages caused by an unfit employee. If a man is found physically unable to perform the duties of motorman and conductor and yet is able to do other work, the company endeavors to find some suitable work for him. For those employees who have had fifteen years continuous service and are shown by these tests to be unfitted to carry on their work a pension system is provided, as will be described later.

The relations between the management and the men in Atlanta during the past six years have been in some respects unique. Up to the fall of 1916 the trainmen were unorganized, but an organization was started in that year and the men struck to secure recognition. The strike was one of the worst in the electric railway history. It was accompanied by a great deal of violence and about thirty cars were dynamited. The company finally won, and the chief dynamiters were sent to state prison for terms of from six to ten years.

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About two years later, while the War Labor Board was functioning, there was a short strike which resulted in another wage increase, and about eighteen months later, or in March, 1920, there was a third strike. This time the cause was the decision of a board of arbitrators which awarded another increase in wages, this time of 15 per cent. This increase was not considered sufficient by the men, who by this time were organized and stayed out for nearly three days. They finally returned to work under the instructions from the national headquarters of the union that the strike would not be recognized.

Last September the national convention of the Amalgamated Association was held in Atlanta and Preston S. Arkwright, president Georgia Railway & Power Company, was invited to address the convention. He did so, and after reciting the history of the company's labor troubles during the past five years, urged the members of the association to engage with the company in another contest, "not as foes but as friends, allies and comrades in arms to make the street railway industry everywhere take the place it is entitled to have." This sentiment has evidently been adopted by the men in Atlanta. Evidence that this is so is given by the issue by the Amalgamated division in Atlanta recently of a pamphlet, entitled "Fares, Hooch, Craps and the Unemployed," which urges all members of the division to give strict attention to duty.

A helpful agent in this spirit of co-operation is a bright eight-page company publication called "Snapshots," published monthly "by and for the workers of the Georgia Railway & Power Company." A typical page is reproduced.

Pensions and Other Co-operative Work

On the first of this year the company announced that it had established a pension plan for employees in all positions who on account of age, infirmity, disease or injury may become unable to perform their duties. This plan is intended to supplement the workmen's compensation law, which makes provision for injuries arising out of employment. Those who have been continuously in the service of the company for thirty years or more and have reached the age of sixty are placed on the retired list and receive 30 per cent of the amount earned during the preceding twelve months, though if the employee desires to continue his work and is considered able to do so the annuity becomes operative when work is discontinued. Employees in the service for twenty-five years and less than thirty years receive 27½ per cent out of their wages earned during the year preceding; those in the service from twenty to twenty-five years and reached the age of sixty receive 25 per cent.

Any employee who has been continuously in the service of the company for fifteen years and has become totally disabled for any cause other than self-inflicted, immorality or injury covered by the workmen's compensation law is placed on the retired list to receive 25 per cent of the salary during the year preceding. The minimum annuity is put at $25 per month and the maximum annuity $100 per month. No provision is made for death benefits or for temporary disability, because both of these cases are covered by the employees' relief association.

Another very practical example of co-operation is an arrangement which the company made with a dentist to do work for employees and members of their immediate family at much reduced rates. The arrangement was that the company would provide office space at the transportation building (with light and heat) without charge, and that the company would collect the dental fees by a small monthly deduction from the payroll of the patient when this plan was desired by the employee. In view of these considerations, the dentist agreed to charge rates only about one-half those charged by first-class dentists outside. A list of these rates with maximum charges has been filed with the company by the dentist. The plan has proved popular.

Another plan, announced March 15, to go into effect April 1, is one in which the company agrees to pay bonuses for accident reduction by the men. Briefly, accidents are divided into three classes, the first class being unavoidable so far as the train crew is concerned; the second, those which might have been avoided if extraordinary care had been used, and the third, those in which the crew was plainly at fault. The bonus is $3 a month for each motorman and conductor whose car does not have accidents of the second or third class, provided they work not less than twenty-five days during the month. The bonuses are paid every quarter, and disputes and controversies with passengers will be classed as some sort of an accident. This bonus plan is confined to trainmen.

Promoting Transportation

Much has been done in Atlanta in the way of promoting transportation and good relations of the public. This is primarily the purpose of "Two Bells," published weekly by the company and distributed through boxes in the cars. "Two Bells" is a little four-page folder with some matter about the company and jokes to make it more readable. Changes in the organization are mentioned so as to introduce the new officers to the public, and the paper is printed on a differently colored paper each week to provide another element of change. A feature is also made of striking utterances by any one in regard to the service. For instance, Mr. Arkwright recently referred to the fact that statistics showed the safest place in Atlanta streets at present is in an Atlanta Street car. This statement was reprinted in "Two Bells" and attracted much comment in the daily papers. Complimentary letters were received by the company, some containing verse with this as a theme. This verse was printed in "Two Bells" with some of the letters.

Another kind of publicity conducted by the company which is notable, because it carries no propaganda, is a series of posters on important historic and other facts relating to Atlanta and Georgia. These are issued weekly and posted in the windows of the cars. They have contained so much instructive information that copies have been eagerly sought by the principals of public schools, not only in Atlanta but throughout Georgia, for posting in the schools. It has been the policy of the company to grant these requests for extra copies, where they have been available.

In addition the company is a member of the Georgia Bureau of Public Utility Information, with headquarters in Atlanta. This bureau is organized like similar bureaus in other states to issue data on public utilities of interest to the public. The Georgia Railway & Power Company also sends out a special weekly bulletin to newspapers, summarizing the industrial conditions in the State. The company is in a good position to obtain

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this information because of its power business and continues the bulletin as a "good-will" service. To some extent the company also uses the backs of the bills sent out by its light and power departments to explain facts about the railway. It has also reserved in its car advertising contracts the spaces in the front and back of the car over the bulkhead for its own advertising, though sometimes it has donated this space for charitable purposes.

Railway Leads Shop-at-Home Movement

Beaver Valley Traction Company's "Get Acquainted" Poster Reproduced by Local Newspaper as a Compliment —Business Houses Support the Movement in Their Newspaper Advertisements

OWING to the fact that the territory of the Beaver Valley Traction Company and Pittsburgh & Beaver Street Railway is but one to one and one-half hours run from Pittsburgh on the steam trains, there is a strong tendency among shoppers to go to the big city instead of patronizing local stores. Lately this has been accentuated by the institution of ten-trip tickets at reduced prices. In November, 1921, for example, 674 tickets were sold from Rochester alone at a price of $5.27 each.

Although the traction companies might be supposed to suffer least from this, because they still get the short rides to and from the stations, W. H. Boyce, general manager, took a different view. On Oct. 18, 1921, he addressed a letter to the Beaver Falls Advertising Club in which he stated that "too many residents of the Beaver Valley do their shopping in Pittsburgh. As I see it, it is not fair—it is not just. In most cases there is absolutely no necessity for it . . . Most of them are dependent upon the manufacturers and merchants of the Beaver Valley for their living, and the condition of this community is therefore of material interest to them. They can help . . . by doing their shopping at home. Won't your organization do some advertising as a body, or suggest to the individual merchants that they run with their large ads, in a small box space, an appeal to our residents to do their shopping in the Beaver Valley?"

Mr. Boyce then went on to show that his companies had already been practicing his preachment, instancing such examples as the following:

TIRED TO-NITE?

Did you spend the day shopping in Pittsburgh?
Most people agree that the hardest day's work for them is a day spent in looking and buying in Pittsburgh.
Save time and money. Conserve your energy.
Keep Beaver Valley dollars at home.
Do your shopping in the Beaver Valley.

SHOP

For the Dealer as Well as the Article

If you could get a 5 per cent reduction in the price of an article by going a block further down the street you would be inclined to go to that much trouble.

Do you know that the actual intrinsic value of the SERVICE that the Beaver Valley merchant is able to render by reason of his proximity is often worth more than 5 per cent?

Try out our local merchants. They will make good on price, quality and service.

GET ACQUAINTED WITH THE STORES OF YOUR COMMUNITY

Persons not in the habit of shopping in the Beaver Valley but who took advantage of Dollar Day reduced car fares were surprised at the character of the stores and the quality of the articles and prices.

Patronize the stores of the Beaver Valley. Secure a better grade of goods. Save money. Keep Beaver Valley dollars at home.

Preceding this suggestion, Mr. Boyce had, in February, 1921, addressed a letter to every store owner

J. C. DOUTT & CO.

Before Stock Taking Sale

QUALITY MERCHANDISE LESS ½ AND ¼ FORMER PRICE

All Ivory Goods One-Half Price	All Middy Blouses One-Fourth Off
All Purses One-Fourth Off	All Shirt Waists One-Fourth Off
All Jewelry One-Fourth Off	All Wool Dress Goods One-Fourth Off
All Colored Umbrellas One-Fourth Off	All Dress Gingham One-Fourth Off
All Silk Skirts One-Fourth Off	All Percales One-Fourth Off
All Silk Bloomers One-Fourth Off	All Table Linens One-Fourth OFF
All Silk Vests One-Fourth Off	All Curtain Nets One-Fourth Off
All Adler's Kid Gloves One-Fourth Off	All Curtain Marquisetts One-Fourth Off
All Boudoir Caps One-Fourth Off	All Silk Curtain Draperies One-Fourth Off
All Silk Camisoles One-Fourth Off	All Sweaters One-Fourth Off
Handkerchiefs at One-Half Off	All Plaid Skirtings One-Fourth Off
Handerchiefs One-Fourth Off	All Manicure Sets One-Half Off
Bed Spreads One-Fourth Off	All Toilet Sets One-Half Off
Embroidered Pillow Cases One-Fourth Off	All Shaving Sets One-Half Off
Corsets One-Fourth Off	All Aprons One-Fourth Off
Children's Bath Robes One-Fourth Off	

J. C. DOUTT & CO.

Rochester Monaca Ambridge Midland

A Lesson Learned IN XMAS SHOPPING

(*Overheard on a Beaver Valley Traction Car enroute to New Brighton*)

Mrs. A—I certainly found shopping today very pleasant.

Mrs. B—How's that?

Mrs. A—Last week I went to Pittsburgh to do some holiday shopping, but found prices so high and I couldn't find a thing I wanted, so I decided to do my shopping at home. I've been in Beaver Falls all afternoon and found just what I wanted and the prices are much lower.

Mrs. B (laughingly)—I had the same experience last year and since then I've been doing all my shopping in Beaver Falls. My husband says we women will eventually learn.

What is true of Mrs. A. and B., is true with hundreds of other women.

BERKMAN'S

Buy at Home

We have reduced the street car fare so that it will cost you less to do your Christmas shopping in the Beaver Valley.

Book of 100 *Tickets Now* $4.50

On sale at your bank or at this office until December 22nd. Tickets good until used.

The Beaver Valley Traction Company

W. H. BOYCE, *General Manager.*

MERCHANTS AND RAILWAY COMPANY CO-OPERATE IN ADVERTISING IN "BUY-AT-HOME" MOVEMENT

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in his territory to inspire them to stress the desirability of face-to-face shopping—in other words, get the customer to come into their stores instead of using the telephone. The Dollar Day reduced fares was one practical way in which the railway helped to do this.

Finally, during the Christmas shopping season of 1921 the management placed in all its cars a poster saying: "GET ACQUAINTED *With the Stores and the Store Proprietors in Your Community*," etc. This poster impressed the publisher of the *Daily Times* so favorably that he reproduced it as a free half-page advertisement, with the following text in the upper left-hand corner:

"This is a copy of a large advertisement which the Beaver Valley Traction Company has been carrying in its cars for several days. It is reproduced here without charge as a compliment to the management of the Traction Company and in the hope that it may benefit Beaver Valley merchants."

The "Berkman's" advertisement also shown indicates that Beaver Valley merchants have seen the point of emphasizing the advantage of home shopping, while the railway's "Buy at Home" advertisement has the logical indorsement and encouragement of a timely 10 per cent reduction in fare obtainable through the use of tickets.

While the foregoing gives but a taste of the many things done by the railway to inspire local business and amusement interests to take proper advantage of their opportunities, it is sufficient as a hint of some of the things a live management can do to build up business.

Massachusetts Safety Campaign

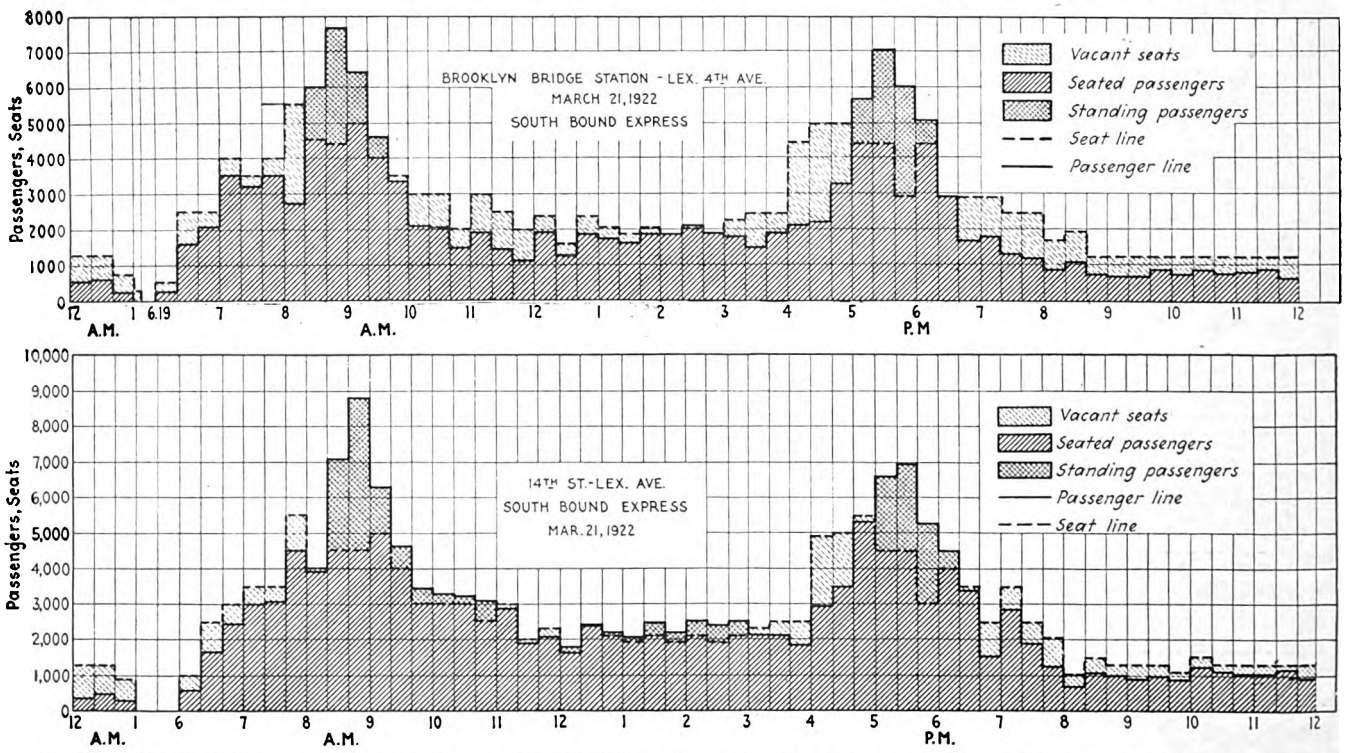
UNDER the direction of the Massachusetts Safety Council, a division of the National Safety Council, a vigorous campaign is being made for the adoption of safety methods and instruction of the public in regard to them. H. Bertram Potter, assistant general manager, Boston Elevated Railway, is one of the vice-presidents of the council, and it has a street railway committee to work out plans of co-operation. In electric railway work the council so far has given special attention to two phases, namely, the child who gets in the track of the trolley car and the motorist who cuts in front.

An effective means of reaching the children has been found to be a little pamphlet entitled "Ten Safety Stories for Young People," designed to be given in the schools and on supervised playgrounds. Each is devoted to some phase of safety, as "How to Cross a Street," "Catching on Behind," "The Trolley Car," etc. Altogether these stories, with an accompanying poster, are being used in 1,185 schoolrooms of the State, and have been sent into several other states.

Interborough Traffic Charts

A FEATURE of the testimony on service standards before the New York Transit Commission during April was the presentation of an extended series of charts of car loadings. They formed part of the testimony offered by the Interborough Rapid Transit Company to show the extent of standing load and vacant seats operated at different times of the day. The charts measure about 50 in. wide x 24 in. high, and one was prepared for each of the principal express and local stations on the route of the Interborough Rapid Transit Company. They represented one day's loadings and were based on observations made by the inspectors of the company.

An attempt will not be made to reproduce all of these charts, but two are shown to illustrate the method of charting this information. One gives statistics as to the southbound express trains at the Brooklyn Bridge station of the Lexington and Fourth Avenue subway on March 21, 1922. The other shows the conditions on the same day and line at the Fourteenth Street station. It will be noticed that most of the standing load is confined to the morning rush hour of from 8:15 to 9:15 and the evening rush period of from 5 to 6:15 p.m.



THE UPPER CHART SHOWS THE LOADING ON THE SOUTHBOUND EXPRESS TRAINS AT THE BROOKLYN BRIDGE STATION OF THE INTERBOROUGH RAPID TRANSIT COMPANY, MARCH 21, 1922. THE LOWER CHART GIVES THE LOADING FOR THE SAME CLASS OF TRAINS, DAY AND LINE AT FOURTEENTH STREET, NEW YORK

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Hints on Freight Office Routine

Billing Methods and Machinery and Other Freight Office Routine Are Important in Handling Electric Railway Freight Business—A Simple Method Is Described, Which Insures Accuracy in the Records and Reduces Complaints to a Minimum

BY N. L. DRAGONETTI
Formerly Chief Clerk of Freight, Philadelphia (Pa.) Rapid Transit Company

TO KNOW what you are doing is the most important angle of the electric railway freight business —or any other business, for that matter. The only way that this can be done is by having reliable and accurate records. The very nature of the business, which includes a mass of detail, should convince one of the previous statement. Yet it is strange to note that many freight managers are of the so-called "practical" type, who know little about figures and their interpretation and, in some cases, even pride themselves on the fact that they are not "figure men."

As a rule, the records of a freight office do not nearly approach the degree of accuracy and of modern method of the average business office of today. Briefly, the following outline touches the high spots in the matter of records for an electric railway freight office, and gives a few general hints which should be applied by those now operating a freight service. It should also serve to give the investigator a slight idea of the extent to which trolley freight transportation has progressed.

When goods are presented for shipment, they are always accompanied by a bill of lading in duplicate, or by as many additional copies as the consignor may desire for his own records. The receiver checks the freight against the second copy or shipping order, at the same time noting if the bill is made out properly and if weights are listed. Many errors which cost both the shipper and the carrier money are caused by carelessness in making out bills of lading. It is up to the carrier to educate the shipping public along lines of shipping economy.

If an item which is written hurriedly by hand looks as though it might mean something other than what it is intended to mean, it will invariably receive a higher rating. If this fact escapes detection altogether, the shipper has paid an excessive freight charge. If it is discovered, it has to be corrected and the error, involving only a few pennies as a rule, by reason of the correction causes a loss of time and money. These errors, all of which may be prevented by a little systematic caution, are very costly, and many large business houses that pride themselves on their auditing and freight departments are losing thousands of dollars annually through their poor freight methods. It is a duty in the interest of their clients as well as their own that freight carriers strive to educate their customers along correct shipping lines.

A statement of weights on the bill of lading by the shipper saves money all around, because the shipper knows the weight of his shipment far better than anyone else, and the transportation companies are usually quite willing to accept their weight estimation, being satisfied to subject it to a casual scrutiny at the time of shipment. If it passes the receiver without being questioned it usually goes through as shipped and just as the consignor desires it to go. On the other hand, if no weights are put on the bill of lading, the receiver must put them on and, not having time to weigh each article, he is compelled to resort to estimated standardized weights. This method is very accurate and serves its purpose very well, but it is only natural that a host of errors creep in and many questions arise between shipper and carrier, which when discovered have to be corrected. As a result the shipper has to go back over his records to get his data, take the matter up with the carrier and prove to him that there was an error in estimating weights. This involves a loss of time and money and is rarely worth the amount in question, whereas, had the weights been put on the bill of lading in the first place, all would have gone smoothly.

The platform being roughly divided into spaces for each line, the goods, immediately after being checked, are trucked into their proper pile. As soon as car space is available the shipment is put into the car and proceeds to its destination. The waybills accompany the car and the freight is checked against these at destination. In the case of participating carriers, the goods are checked out of the local car into the foreign car at the transfer point. If this plan is strictly adhered to, there will be few claims for lost goods.

After the shipping order has been checked by the receiver, it is sent to the office for waybilling. The receiver's desk should be located very close to the office and as close as possible to the rate clerk's desk. For these waybills have to be made out almost as fast as they come in and the rate clerk has to walk many miles to and from the receiver's desk carrying in bills of lading if they are not close together.

SPECIAL RATE CLERK A NECESSITY

Many freight offices have their bills made out by hand, using copying pencils and carbons, each biller doing his own rating. It has been found that this method is productive of a startling number of errors, and can only result in greatly impaired efficiency. There should be a special rate clerk who does rating and rating exclusively. Since this clerk is constantly referring to the classification and as constantly figuring extensions he becomes in a short time very accurate and swift. He gets to know the extensions of freight rates without any effort at all, in exactly the same way that we are all familiar with the extensions of the multiplication table, which we all learned years ago, and which we apply to almost every problem we attempt. Calculating machines are of little use to the rate clerk, for an intelligent clerk with a fairly good memory can outclass any calculating machine made. Calculating machines, however, are very necessary and useful in the auditing and other departments of the trolley companies, where speed is not such a vital element. After the rate clerks have classified the items and figured the extensions, the shipping order bearing all this information is passed on to the billers.

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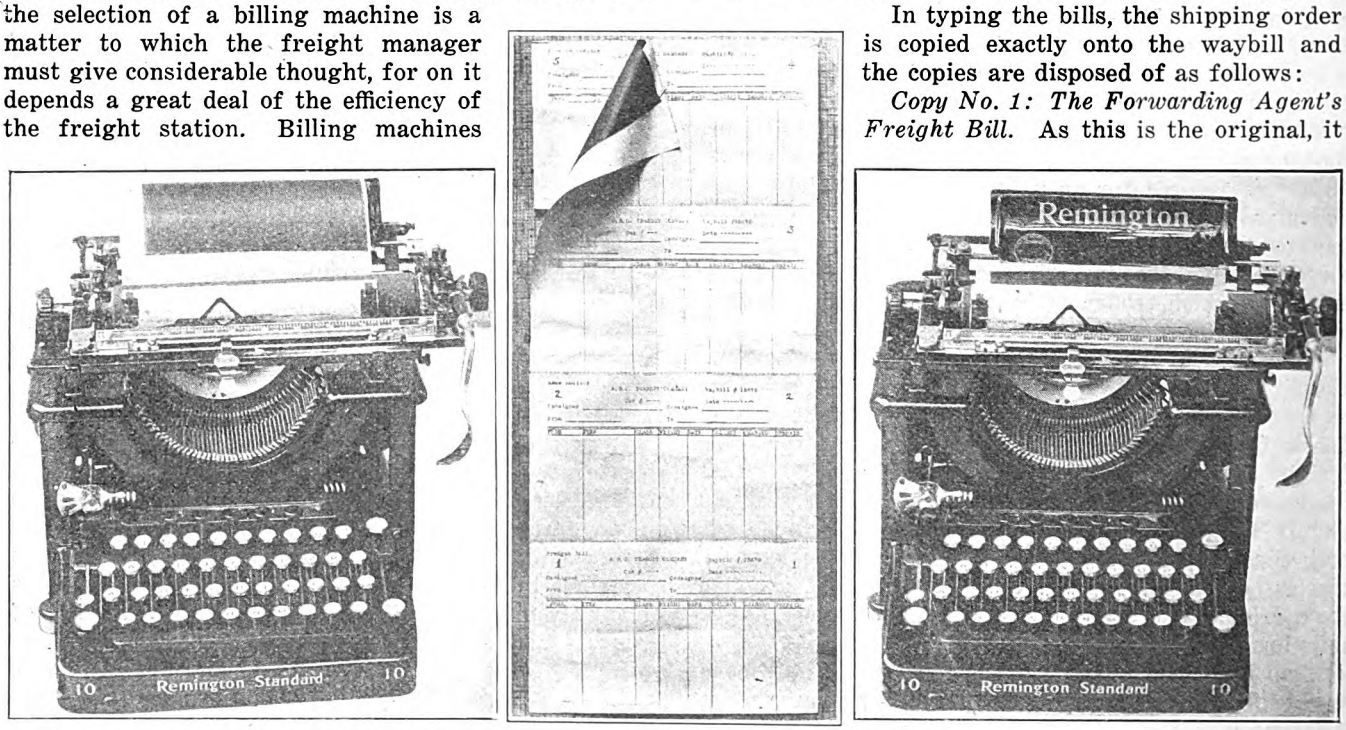
The billers' desks should be located as close to the rate clerks as possible, in order to eliminate any waste time in going to and fro to get bills many times during the day. In fact, the billers' desks can be so arranged that the billers do not have to rise at all to get bills, the rate clerk being so close that he can pass them to the billers as rapidly as is necessary. The element of speed is paramount until the bills are completed, as the bills must be ready before the car is loaded, for if the car is ready to go and the bills are not the car is delayed, occasioning a loss of time and money, and this means, of course, that the car cannot arrive at its destination at its scheduled time. If, on the other hand, the car goes without the bills, the shipments cannot be checked out of the car, and many disputes and claims will result.

There are a great many billing machines and billing methods in existence at the present time. For all of these the claim is made that they are perfectly adapted to freight way billing. Any one of these billing machines would be far better than hand billing. But the selection of a billing machine is a matter to which the freight manager must give considerable thought, for on it depends a great deal of the efficiency of the freight station. Billing machines must be simple, durable, easy of operation, and capable of being easily repaired. From personal experience, it has been found that the following billing method has not been bettered, and it costs hardly anything to demonstrate its superiority.



IN CENTER, ENTIRE WAYBILL, TORN TO SHOW POSITION OF FIFTH COPY AND CARBON. AT LEFT, FIRST POSITION OF WAYBILL IN WRITING MACHINE. AT RIGHT, SHOWING WAYBILL ROLLED AROUND ROLLER, AND IN POSITION TO BE WRITTEN UPON

Waybills usually consist of five copies. These copies are numbered from one to five, the entire bill bearing a serial number which appears on each copy. The copies are separated from each other by perforations, to permit them to be torn easily. These copies are numbered from the bottom up; that is to say, the bottom copy is number one, and so on. The fifth copy, which is at the top, however, is printed on the opposite side to that of the other copies and is folded back along the perforation with its printed side against the rest of the waybill. A carbon, the length of four copies, is inserted in between the fifth copy and the other four, with the carbon side of the paper facing out. The bill is then placed in an ordinary typewriter which has a roller whose circumference is equal to the width of one of the copies, and the bill is rolled around the roller, thus bringing the first copy, or original, direct to the type and the others in their respective numerical positions.

It is rather difficult to explain this plan on paper, but it is extremely simple in operation and an idea may be obtained from the accompanying illustrations. A few hours experimenting along these lines would prove of incalculable value to anyone interested in billing. The bills are inserted in an incredibly short time, billers becoming very readily familiar with the plan, it being only necessary to insert the end of the bill with a quick motion of the hand and roll it up. When the bill is finished a quick pull at the back of the bill brings it out. This billing system has been in practical use for a number of years and has been in direct competition with some of the best billing machines made, and has demonstrated its superiority in every case. The handle of the roller should be slightly larger than is customary, so as to allow the biller to roll the bills up more rapidly.

In typing the bills, the shipping order is copied exactly onto the waybill and the copies are disposed of as follows:

Copy No. 1: The Forwarding Agent's Freight Bill. As this is the original, it is usually forwarded to the shipper for his records in the case of shipment being charged. It shows the amount of his indebtedness to the carrier, and after auditing the charges the consignor usually submits it with payment for the freight.

Copy No. 2: The Home Auditor's Copy. This is forwarded to the home auditor for purposes of auditing and as a permanent record for the auditing department.

Copy No. 3: Delivery Receipt. This accompanies the goods to the destination and is signed by the receiving agent at the time the goods are checked out of the car, either at transfer point or destination, and is returned to the forwarding agent for his files, which of course completes the shipment as far as records are concerned. It is proof of delivery.

Copy No. 4: Delivery Sheet. This accompanies the goods to the destination and is given to the consignee upon delivery.

Copy No. 5: The Foreign Auditor's Copy. This is

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forwarded to the foreign auditor for purposes of auditing and figuring his share of the freight receipts.

After being waybilled, the bills of lading are arranged in numerical order and sorted into as many lines as there are participating carriers. From these sorted bills of lading an abstract is made showing number of waybill, name of shipper, destination, weight, amount of charges, and whether collect, charged or prepaid. One copy is retained for files and two copies go to the auditor for his records. The bills of lading are then filed in numerical order by lines and a separate file is made up daily. These files are referred to constantly and are very valuable in settling claims, hence great care must be exercised in their preparation.

All of the number one copies of the waybill that are charged are picked out and sorted into lines. They are listed by amounts and compared with the totals of the charge columns of the abstracts. In this way the errors in billing and abstracting are discovered, which is necessary in order to keep the bookkeepers' records straight. Each line is proved out in the same way, and the listed charges after being recapitulated should agree with the recapitulation of the abstracts. The charge bills are then sorted into alphabetical order by shippers' names and entered into a journal, the total equaling the charges on the abstracts. The bills are then mailed to the customer and the items in the journal posted to the accounts receivable ledger, the totals of the journal being posted to the proper controlling accounts.

Cash prepaid bills are balanced in the same way as the charge bills, with the exception that they travel from the receiver to the cashier, who figures the extension, collects the money, lists the waybill number, destination, shipper's name and amount on a sheet, and passes the bill on to the billers for billing. At the close of the day the totals of the cashier's sheet should equal the totals of the prepaid columns on the abstracts. Money received for accounts receivable is listed on a credit sheet and turned over to the cashier for deposit along with the other cash receipts. The cashier lists these amounts and checks with the bookkeeper's records and, after verification, the totals are posted to the proper controlling accounts.

Whenever an error is discovered a correction notice is issued in quadruplicate showing how the bill appears and how it should appear. One copy is attached to the shipping order, one is forwarded to the home auditor, one to the foreign auditor and one to foreign station affected by the change.

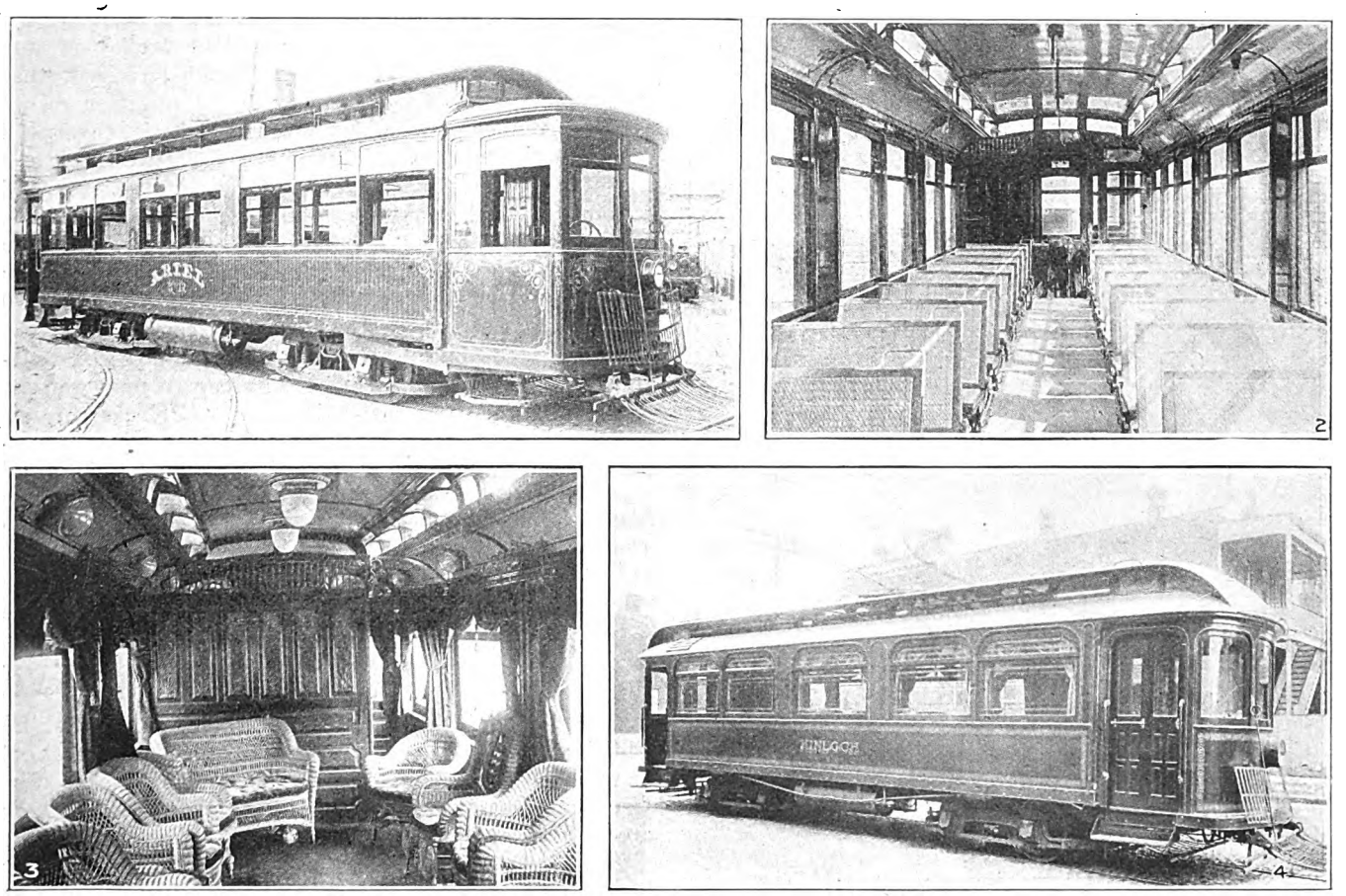
Signed delivery receipts should be filed and kept on record at the office for the purpose of reference in settling claims. They are used constantly and will save many dollars in claims if kept properly.

"Special" Car Service in St. Louis

Private Parlor Cars of Former Days Now Rented for Special Parties—Only One Retains Original Luxurious Furnishings

TWO of the three special parlor cars of the United Railways of St. Louis, relics of World's Fair days (1904) and formerly used by officials of constituent lines before the consolidation of the companies in 1907, have been converted into "specials" and are earning their keep instead of accumulating more rust as they did for several years of comparative inactivity.

One of the three parlor cars, the Kinloch, is kept in its original form, with movable and wide wicker chairs



SPECIAL CARS IN ST. LOUIS—CONVERTED BY EQUIPMENT WITH STANDARD SEATS AND PARLOR TYPE

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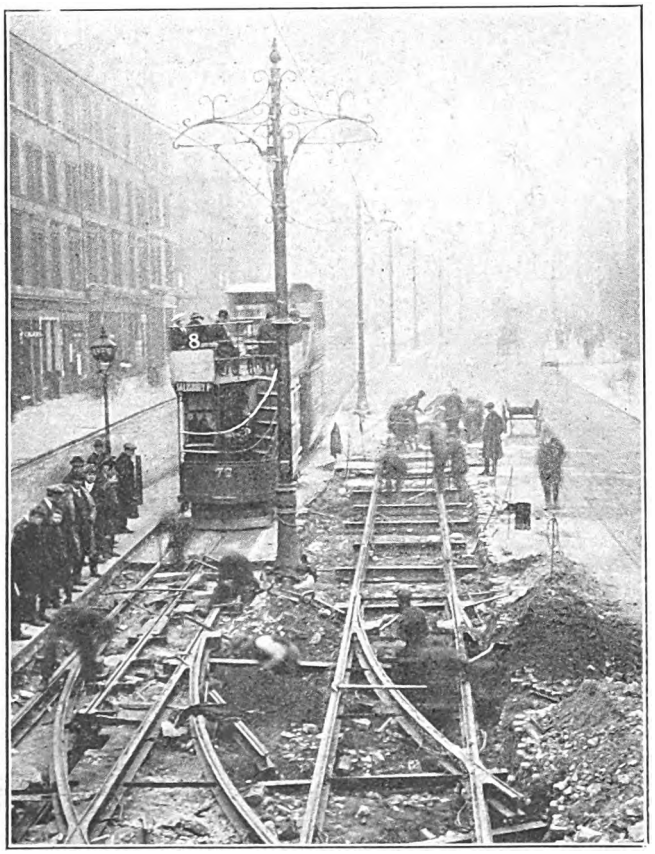
and plush upholstery, and is in occasional demand for parties of distinguished visitors. In the last six months, however, it has been in service only 15.15 hours, showing a mileage of 110.75 and a revenue of $71. It may also go the way of its companions, the Electra and Ariel, and thus mark the final passing of luxurious parlor trolley car travel in St. Louis. It seats twenty-six passengers.

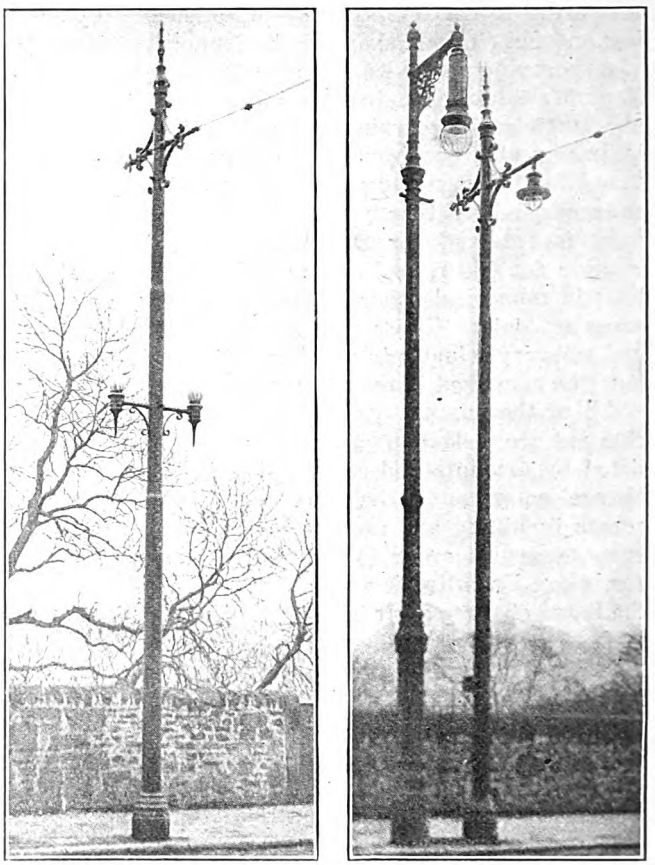
The management removed and sold the old furnishings of the Ariel and Electra and put in ordinary seats, giving each a capacity of forty passengers. The cost of alterations was about $800 for each car. They are advertised as "specials" and used for party trips—clubs, secret societies, visiting delegations, etc. In six months the revenue from Ariel was $543 and from Electra $154. Ariel's mileage was 587, car-hours 161.45, revenue per car mile 0.93 and revenue per car-hour $3.29. The charge is $8 an hour from the time it leaves the shed until it returns to the shed. The charge for the sole surviving parlor car, Kinloch, is $10 an hour, and when the difference in types of car and service charge is explained to the inquirer the usual preference expressed is for the "special" rather than the "parlor" coach.

Attractive Overhead Construction in Edinburgh

ONE of the reasons for the adoption of cable traction in Edinburgh instead of the trolley in the early days of mechanical traction was that residents of that city take great pride in the appearance of Princes Street. It is undoubtedly one of the finest streets in the world, passing as it does Edinburgh Castle as well as monuments to some of the famous men of Scotland.



LINKING UP THE EXISTING LEIGH TROLLEY SYSTEM WITH THE EDINBURGH CABLE SYSTEM, SOON TO BE ELECTRIFIED



AT LEFT—SPAN POLE WITH FLAMBEAU LIGHTING FIXTURE TO BE USED ON THE CENTER POLES ON PRINCES STREET. AT RIGHT —THE OLD AND THE NEW METHODS OF STREET LIGHTING IN EDINBURGH

At the time the cable system was adopted for Edinburgh the underground electric railway conduit system had not been developed and even the trolley system was in its infancy. When it was decided recently that the cable system must come out, the question of an electric conduit system or a very attractive overhead system was vigorously debated in the City Council and by citizens generally. Those in favor of the overhead system included the general manager of the tramways, R. Stuart Pilcher. The matter was finally referred to the Ministry of Transport, which held public hearings on the subject and rendered a decision on April 10 in favor of the overhead system with center poles.

In the meantime designs for a center-pole construction had been prepared by the tramway management and submitted for inspection. For Princes Street, which is about 70 ft. wide from curb to curb, the proposed plan calls for a devil strip only 6 ft. wide, and center poles with short brackets so that the trolley poles have an inside rake toward the trolley wire. These center poles are designed to carry incandescent light fixtures with flambeau or torch-shaped globes. The design of these lighting fixtures is shown on a side pole to which they have been attached for demonstration purposes. Another view shows the old and the new system of street lighting in Edinburgh. In the new method the lamp is hung on the span pole, so that no additional pole at that point is required. The third view shows a section of overhead double bracket construction already completed, but in this case the brackets are of standard length.

The electrical equipment of Princes Street will not be undertaken for some six months. The poles have got to be designed and built. Moreover, so many tour-

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ists visit Edinburgh during the summer that it has not been thought wise to begin actual construction on the new equipment until the tourist season is largely over.

Letter to the Editors

Railroad Electrification and the Bell Telephone System

AMERICAN TELEPHONE & TELEGRAPH COMPANY

NEW YORK, N. Y., April 27, 1922.

To the Editors:

I am inclosing herewith a copy of a letter which I have written to George Gibbs with reference to his article on railroad electrification recently published in your journal.

I have thought that the position of the American Telephone & Telegraph Company in regard to railroad electrification from the viewpoint of the telephone companies of the Bell System was of sufficient general interest so that you would be willing to publish this note and the inclosed letter.

B. GHERARDI,
Vice-President and Chief Engineer.

EDITORS' NOTE—The body of the letter from Mr. Gherardi to Mr. Gibbs is reprinted below.

I have read with great interest the abstract of your article in the ELECTRIC RAILWAY JOURNAL of Jan. 28, 1922, entitled "Electric Traction on Heavy Traffic Lines." This article, coming as it does from an engineer of such experience and standing as yourself, is, in my judgment, a most important contribution to the subject with which it deals. In the abstract I note the following paragraph:

"It would appear that the development of electric systems is proceeding along normal and logical lines. However, there is some reason to feel that this orderly consideration of the subject may not continue, because of the views which are being expressed by those who are not engaged in operating the railways, but are connected with other industries, including manufacturing, telegraph and telephone service and power generation. While these interests have decided views and are expressing them, the railroads, which must use the apparatus, have not considered it necessary actively to advocate any particular electric system."

After reading the abstract referred to above, I have consulted the original to see whether the abstract correctly expresses your views as given in the original paper. It appears to me that it does.

What you say about the views which are being expressed by those connected with the telephone and telegraph industry leads me to write this letter with reference to the position of the American Telephone & Telegraph Company in regard to railroad electrification, in order to make it clear that the companies of the Bell Telephone System need not be feared as a factor likely to interfere with the orderly consideration of the railroad electrification problem. I wish to state definitely and without qualification that this company is not aligned on either side of the a.c. vs. d.c. controversy. The only interest of the telephone company in this matter is that as railroad electrification is installed it shall be so designed and operated as not to impair or destroy the telephone company's service. Subject to this point, the type of electrification of railroads is a matter of no concern to us.

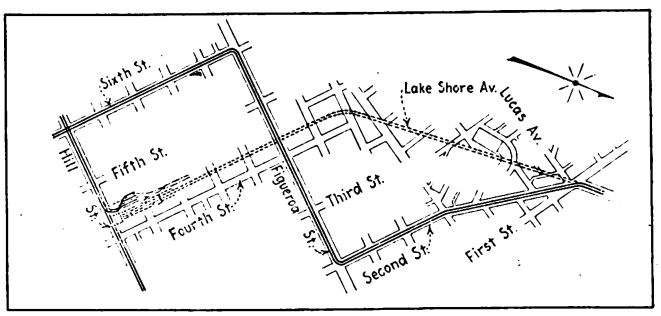
With either the a.c. system or the d.c. system of electrification, the design may be such as seriously to impair the telephone company's service if careful study of this phase of the question is not included in the planning. On the other hand, with either system the designs and arrangements can be so worked out as not to impair this service. From experience up to the present time with electrification projects of both types, it is clear that much more extensive precautions and greater expense are required to provide the measures necessary to avoid interference to communication service with the a.c. system than with the d.c. system. This is not in any sense a matter of opinion or argument, but simply a fact which, as far as I know, has not been questioned.

I hold the railroad companies and their officials and engineers in high esteem and I know that it is their desire and intention to avoid impairing the telephone company's service. This has been true in the case of those railroads with which the questions concerning electrification have already come up, and I know it will be equally true with the railroads planning electrification in the future. In some cases, however, there is not a full appreciation of the steps which it is necessary to take in order to avoid impairment of the telephone company's service, and the extent to which it is necessary for the telephone engineers to work in cooperation with the railroad representatives to establish the facts and to assist the railroad in determining the steps which must be taken to protect the telephone company's service. This must be done while the electrification plans are being worked out, as it is only at that time that the measures which may be indicated to prevent impairment of telephone and telegraph service can be properly incorporated in the general plans, and also because, obviously, this is the time when the relative costs of such measures should be considered and due weight given to the bearing they may have on the choice of systems.

Projected Subway in Los Angeles

THE Pacific Electric Railway has made an application to the city of Los Angeles for a forty-year franchise to operate trains through a subway which it proposes to bore between its Hill Street terminal and Glendale Boulevard. Such a subway would bring the San Fernando Valley towns, and Glendale, Burbank and Hollywood, ten minutes closer to Broadway and would be an important step in the solution of the city's traffic problem. It is understood that work will begin as soon as the franchise is granted.

The improvement was ordered on Dec. 24, 1921, by the California Railroad Commission, following its decision granting the Pacific Electric an increase in passenger rates, and the company's officials state they are ready to commence the work on short notice. It is expected that two years would elapse before the work could be finished. The proposed tunnel, it is expected, will cost approximately $1,850,000, and fifty new multiple-unit cars, already ordered to operate over the new cutoff, will cost $900,000. The tunnel will be 1 mile long. Among its outstanding features will be:



PROPOSED ROUTE OF SUBWAY CUT-OFF IN LOS ANGELES

The removal of at least fifty grade crossings for not less than 250 trains a day.

Shortening of the running time between San Fernando Valley points, Glendale, Burbank and Hollywood, to Los Angeles, by at least ten minutes.

Taking a number of through trains off of the streets and thereby relieving congestion, reducing liability to accidents and speeding up the other cars on those streets.

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Selling Transportation*

Various Methods Are Followed for Interesting the Salesmen in Giving Personal Service and for Discouraging Automobile Competition

BY G. I. PLUMMER
Superintendent of Transportation, Dallas (Tex.) Railway

SELLING transportation involves exactly the same elements of human psychology as the selling of any other commodity. In this paper only the practical aspects of selling transportation will be discussed, and for the most part the material developed is the result of our own experience in the effort to sell street car service in Dallas. One who would sell something successfully must know his commodity as it actually exists, and must have a comparative knowledge of similar commodities elsewhere. His attitude must be analytical, in that he is not content with accepting things as they are, but instead is of a disposition to discover how conditions may be made better. To sell transportation successfully, it is necessary that the commodity have real value. This value must be so tangible and apparent that the prospective purchaser will recognize the value when he comes in contact with the service. In our own case we undertook to study the conditions of our service. This analysis revealed many opportunities for improvement, and we are working constantly on details whereby our service will be improved.

Practically all salesmanship is the result of the contact of minds. In the street railway business the man who sells, or fails to sell, rides is the conductor or motorman. The public recognizes in the trainman a representative of the company, and so interprets the service he gives. Consistent effort should be made to impress trainmen with the importance of giving the correct interpretation of the company's attitude toward the public. In place of the "hard boiled" service commonly received, passengers on the street cars should be impressed with the friendly, kindly, attentive, personal service the trainmen attempt to give.

When a traveler boards the street car at the Union Station, the conductor smilingly welcomes him to the city with a cheery "Good morning," or proper salutation, and invariably should follow with, "May I direct you anywhere in the city, sir?" or a similar remark. When not too busy, the trainman should make it a point to remark that the visitor has come to a good town, and that he is glad to have him. Trainmen should carry maps of the city so that they can give detailed information when requested. This is an example of what is meant by "personal service" on the part of trainmen. Naturally every one who rides the street cars is entitled to expect normal street car service, and this is taken for granted. An effort should be made to sell the service by the uncalled-for, unusual, attentions, and friendly contact between trainmen and the public. In this connection, trainmen should be always alert to improve the conditions of service, and frequently suggestions of great value may be received from them.

TRAINMEN WRITE CAR CARDS

As an example in Dallas, each of our street cars carries "car cards" of the company. These cards frequently are written by our trainmen, and their names appear on the cards as the authors. Reflecting the attitude of these men, the following messages they have written are suggestive. One carries the picture of our trainman who has been longest in the service. Under his picture is a brief statement of his seniority, and in large type, opposite the picture, under the head: *"Personal Service.* Each trainman wishes to give you the kind of service his best friend deserves. He, personally, wants you to be proud of Dallas and its street car service."

Another ad reads: *"Friendly service.* All trainmen are glad to go out of their way to give you real service. They are proud of their work for a greater and better Dallas."

It will be noted that an effort is made in these advertisements to associate our street car service with the reputation of the city. Those of you who are acquainted with Dallas know that its civic pride is unexcelled and that this effort, if successful, ties the street car service inseparably with the pride of the city.

Another of these advertisements reflecting personal service reads: *"Pleased to Serve.* Parents may safely trust their children of school age on the street car. Trainmen derive personal pleasure seeing that the little ones arrive safely." This card was illustrated by a picture of its author, a trainman, aiding a small school child aboard the car.

This type of advertising has assisted salesmanship, not only by acquainting the public with our attitude, but also has served as a guide for trainmen in their efforts to improve their service. Some of the older men have been inclined to look upon this new way of doing things with some opposition, and the advertisements written by the trainmen and posted on the bulletin boards have done much to whip these men into line. In order to sell unusually good service, we find that the idea must be sold first to the trainmen. We treat them as we would have them treat their passengers. A reward of $5 is paid for each advertisement accepted from trainmen.

The service on the cars should be rendered as personal as possible. Trainmen who have caught the spirit that passengers are really their guests seldom fail to demonstrate that they appreciate their business. This is shown by their attention to elderly or infirm people. They always assist women with packages, and do the other little services that show their friendly interest for the passengers. Our attitude in this regard is reflected by a "car card" advertisement we have carried. It follows: *"Read Matthew 7:12.* Our idea of how our patrons should be treated is simple: That we treat them as we would have them treat us were they in our place and we in theirs."

Much of the unfriendly criticism of street railway service comes from those who have been required to wait as the result of unavoidable delays or traffic tie-ups. To overcome this trainmen should make it a universal practice to tell passengers in a brief way the cause of the delay. After a person has waited twenty minutes for a car much of the sting is taken away if the conductor remarks, "Sorry to have kept you waiting, sir, but a freight train held us up," or "automobile broke down on the track," or "automobile ran into the car," etc. These explanatory remarks not only give the passengers a basis for correct appraisal of the service, but also convey to him the trainman's personal interest in giving him good service.

In selling service we should analyze to determine those factors that passengers demand to be present. You will find that the requirement is for service in which dependability, rapidity, courtesy and safety are emphasized. With this in mind, advertise consistently, emphasizing these four elements. A suggestion for one of these advertisements follows: *"Ride the Street Cars.* It takes you there; it brings you back. Uniformly courteous service. Always safe, quick and economical."

The wording of this advertisement should be changed frequently, but the thought back of it should never be lost. It is a well-known fact that people learn and believe by being impressed forcefully and frequently by the same thing. Utilize this principle in selling service and hammer constantly to drive into the minds of the passengers the truth of the statement. One morning a sudden cold snap practically paralyzed all traffic except the street cars. All daily papers simultaneously carried the bold announcement that the street car was the one dependable type of transportation, and emphasized the satisfaction of riding the street car as compared with the exasperating and expensive use of the automobile on such occasions.

MEETING AUTOMOBILE COMPETITION

The automobile is the competitor of the street car. Recognizing this, advertise constantly in such a way as to emphasize the superiority of street car service over the use of the automobile.

*Abstract of paper presented before the Street and Interurban Railway Section of the Southwestern Electrical and Gas Association, San Antonio, Tex., May 3-6, 1922.

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Advertisements should point out the place of automobiles as pleasure vehicles, and then demonstrate how the street car is much more economical for ordinary daily business purposes.

The public can be encouraged to assist in the improvement of service by buying metal tokens. In this connection, each conductor should give at least two tokens in change when a coin larger than a dime is presented for fare. In this way the passenger receives his return fare and does not have to bother with change. You will find that one does not hesitate to spend a metal token as much as real coin. Accordingly, the person who carries metal tokens likely will ride the street car more frequently than those who pay straight cash fares. To this end the sale of metal tokens should be stressed, and many passengers will buy them in rolls of twenty each. Through the personal contact of trainmen and by means of advertising, many passengers will form the habit of buying a stock of metal tokens at the beginning of the week, thus providing transportation for days at a time.

Selling transportation has been a matter of much concern to us in Dallas. We have attempted to put over the sale by studying the service from every possible angle. We have injected an attitude of friendly, helpful co-operation between our trainmen and the public. Our advertisements by means of "Trolleygrams" (distributed on the street cars), car cards posted in the cars, and newspaper advertising and publicity, have always been centered on creating a friendly attitude on the part of the public, and studying concretely the things in our service that suggest a basis for the kindly opinion of the rider.

By way of summary, we have regarded the sale of street car rides in the same light as the manager of a department store views the sale of his goods. We have tried to create a commodity of such outstanding excellence in its mechanical and human elements that the prospective purchaser automatically thinks of the rapid, safe, economical and dependable "yellow electric limousines" when he wants to do something that involves going somewhere in Dallas.

Speakers for Canadian Association Convention Announced

SUPPLEMENTING the skeleton program for the Quebec convention of the Canadian Electric Railway Association, given in the April 29 issue of this paper, the following rounds out the program as completed to date:

The addresses of welcome on Thursday, June 1, will be given by Lieut.-Gov. Sir Charles Fitzpatrick and Mayor Samson of Quebec.

On Thursday afternoon Dr. Louis Herdt, consulting engineer, Montreal, will speak on "Valuation of Street Railway Assets, Their Maintenance and Depreciation." This will be followed by a paper on "The Modern Street Railway Motor," by J. K. Stotz, Canadian Westinghouse Company, with discussion by W. G. Gordon, Canadian General Electric Company, and W. R. McRae, Toronto Transportation Commission.

On the morning of Friday, June 2, D. E. Blair, Montreal Tramways, will read a paper "Motor Buses and Trackless Trolleys." In the afternoon there will be a paper on "Welded Track Joints," by E. B. Entwisle, Lorain Steel Company, and a motion picture exhibit by courtesy of the National Safety League and the Dominion Wheel & Foundries, Ltd.

Up to May 1 the following exhibitors had been listed for the convention: Canadian Westinghouse Manufacturing Company; Ohio Brass Company; Taylor Electric Truck Company; Ottawa Car Manufacturing Company; Canadian General Electric Company; Lyman Tube & Supply Company; Dominion Wheel & Foundries; Railway & Power Engineering Corporation; National Pneumatic Company; Nichols-Lintern Company; Canadian Power & Foundry Company; Witherow Steel Company; Consolidated Steel Corporation; Canadian Street Car Advertising Company; Don M. Campbell, mechanical engineer; Transit Equipment Company; McGuire-Cummings Manufacturing Company; Cleveland Armature Works; Lindsley Brothers (Canadian) Company; the Tool Steel Gear & Pinion Company; Southam Press; Canadian Cleveland Fare-Box Company; Universal Lubricating Company; Arthur Power-Saving Recorder Company; Canadian National Carbon Company; Standard Underground Cable Company; Canadian Brill Company; the J. G. Brill Company; Eugene Phillips Electrical Works; Canadian Steel, Ltd.; Hunters Joint Block Company; Cheatham Electric Switching Device Company; Nachod Signal Company; United States Steel Products Company; C. E. A. Carr Company; Dawson & Company; "Silent Conductor" Company; Northern Electric Company; Sarnia Bridge Company; Ontario Safety League; Vickers, Ltd.; *Canadian Railway & Marine World, Electric Traction, Electrical News,* ELECTRIC RAILWAY JOURNAL.

Adjusting Track Construction to the Lightweight Car*

An Account of Two Track Jobs Recently Completed in Fort Worth, in Which Advantage Was Taken of the Light Weight of the Birney Cars Operated There in Cheapening Construction

BY R. G. TABER
Division of Construction and Engineering, Stone & Webster

SINCE 1906, when the writer first became associated with Stone & Webster, track construction for permanently paved streets has undergone radical changes. There still exists considerable difference of opinion as to what constitutes the best type of construction for paved streets, but all agree that what we are striving for is to find that type of track construction of first low cost which gives a long life with an economical maintenance cost.

*Abstract of paper presented before the Street and Interurban Railway Section of the Southwestern Electrical and Gas Association, San Antonio, Tex., May 3-6, 1922.

The most successful type with which the writer has had experience is what may be termed the "sandwich" type. This involves a sub-base of concrete, gravel ballast, the track itself, the paving base and the surface. The sub-base assures uniform resistance of the substructure. The gravel ballast transmits the load from the ties and its flexibility allows the track to be brought to a true surface. It also allows immediate operation of cars on completion of the job. Furthermore it provides resilience. The ties take the load from the rail, distributing it through the ballast, while the rails

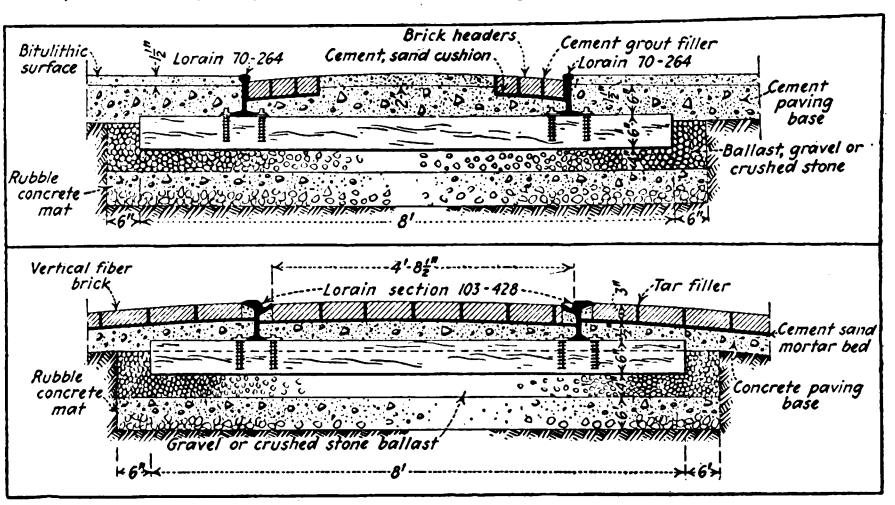

FIG. 1, ABOVE—TRACK USED IN FORT WORTH FOR SAFETY CAR TRAFFIC ONLY (SEE TABLE I). FIG. 2, BELOW—FORT WORTH TRACK FOR CONGESTED DOWNTOWN STREETS (SEE TABLE II)

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TABLE I—DATA FOR TRACK AS IN FIG. 1

Material for 1 mile of track

Item	Kind	Size	Quantity	Remarks
Rail	High-tee	70-lb.	110 tons	
Joints	Simplex bars	70-lb.	180 pairs	
Bolts	Machine	⅞-in. x 3½-in.	360	
Tie plates	Sellars	6-in. x 9-in. x ½-in.	5,300	4,524 with ties on 28-in. centers
Spikes	Screw	⅝-in. x 6-in.	11,000	9,050 with ties on 28-in. centers
Ties	Pine	6-in. x 8-in. x 8-ft.	2,650	2,262 with ties on 28-in. centers
Ballast	Gravel	¼-in. to 2-in.	1,250 cu.yd.	
Pavement	Bitulithic	2-in. thick	3,520 sq.yd.	
Brick headers	Vertical fiber	3-in. x 4-in. x 8-in.	47,000	
Concrete	Paving base		850 cu.yd.	
Concrete	Mat		880 cu.yd.	

TABLE II—DATA FOR TRACK AS IN FIG. 2

Material for 1 mile of track

Item	Kind	Size	Quantity	Remarks
Rail	Groove	103-lb.	162 tons	
Joints	Apex bars	103-lb.	180 pairs	
Bolts	Machine	⅞ x 3-in.	360	
Tie plates	Sellars	½ x 7-in. x 10-in.	5,300	
Spikes	Screw	⅝-in. x 6-in.	11,000	
Ties	Pine	6-in. x 8-in. x 8-ft.	2,262	
Ballast	Gravel	¼-in. to 2-in.	1,250 cu.yd.	
Pavement	Brick	3-in. x 4-in. x 8-in.	80,000	
Filler	Tar		70 cu.yd.	
Mortar bed	Cement sand		65,000 lb.	
Concrete	Paving base		850 cu.yd.	
Concrete	Mat		880 cu.yd.	

furnish the requisite stiffness for the structure, especially after the paving base has been poured.

A radical change, which should have due consideration in the designing of track, is that which is due to the modern lightweight equipment. It is inconsistent to build track for the 15,000-lb. Birney cars as heavy as that which is necessary for double-truck 44,000-lb. cars. Although modern equipment is less than half the weight of old designs, this does not mean that the track weight can be reduced proportionately. It does mean, however, that there is another factor to be considered in the design of street railway track construction.

Working along the line of lighter construction of track for use with lighter cars, the writer first attacked the matter of tie spacing. The standard spacing is 2 ft., but on two track jobs just completed in Fort Worth the ties are placed on 28-in. centers.

On these tracks, on which Birney cars are operated, there is a 6-in. concrete sub-base, with 4 in. of ballast under the ties. Tie plates are used on every tie, and other details include screw spikes, 7-in. 70-lb. tee-rail, brick headers next to the rail on the inside of the track, a 6-in. concrete paving base and a 2-in. "bitulithic" wearing surface. The total length of the two jobs is somewhat over a mile.

The saving on these jobs was 378 ties, which at the rate of $1.77 saved $650, or 13½ per cent, on the tie account. While this amount may seem small, in a city having an 80-mile street railway system the saving alone on ties at this rate would amount to $2,600 per year, assuming a life of twenty years for a tie. The saving would apply under current conditions as to prices if tie plates and spikes are included.

The tie is only one item. The writer firmly believes that if engineers will pull together they can make large savings in other directions. Take, for example, the rails; in place of the special rolled sections which have been considered necessary in the past, with lighter equipment it ought to be possible to find a standard section that will meet the requirements.

The next important step after agreement has been reached as to the best type of construction for either heavy traffic or light traffic is provision for proper supervision. This is a matter which usually does not have sufficient attention.

Referring to the illustrations of track cross-sections used at Fort Worth, Fig. 1 is the construction now being used for the track for the lightweight Birney car. Fig. 2 shows the type being used in the downtown section for heavy traffic where double-truck and interurban cars operate. While concrete sub-base is used in both cases, the writer does not believe that this is necessary where the soil and other natural conditions provide suitable drainage.

Pennsylvania Association Meets June 1

THE following tentative program has been prepared by the Pennsylvania Street Railway Association for the annual meeting to be held at the Penn-Harris Hotel in Harrisburg, Pa., on June 1 and 2:

JUNE 1

Address by President T. B. Donnelly, West Penn Traction Company.
Reports of committees.
Report of Secretary and Treasurer, Henry M. Stine.
Report of special jitney committee.
Paper on "Power-House Economics," by David B. Ainey, consulting engineer, Harrisburg, Pa.
Paper on "Light-Weight Double-Truck Cars," by W. J. Clardy, railway engineer, Westinghouse Electric & Manufacturing Company.

JUNE 2

Paper on "Recent Developments in Concrete," by D. A. Tomlinson, Chicago, Ill., manager railway bureau Portland Cement Association.
Association business, including election of officers.

On Thursday evening will occur the annual dinner, which will be informal and held at the hotel. Members and special guests are invited. Hon. W. D. B. Ainey, chairman Pennsylvania Public Service Commission, and Robert I. Todd, president of the American Association, are expected to be among the speakers at the dinner.

Transport Congress

A CONGRESS of the Institute of Transport will be held in London May 17-19. Technical sessions will be held in the mornings, and visits and inspections will be made in the afternoons. A delegate's or visitor's card will afford free travel on the bus, tramway and subway lines in London during the three days. The president of the Institute is Lord Ashfield, and H. E. Blain of the London Underground Railway is honorary secretary.

The papers include addresses on all branches of transport. Those related to street transportation include the following: "Highways in Relation to the Development of Mechanically Propelled Vehicular Traffic," "Road Vehicles for Passenger and Goods Service," "The Finance of the Modern Highway," "'Safety' Railway Operation," "The Operation of Suburban Passenger Service on Steam Railways, with Particular Reference to Density of Service, Terminal and Other Facilities."

This is the first congress held in London devoted to all branches of transport.

International Tramways Union

A REORGANIZATION meeting of the International Tramways Union was held in Brussels on Feb. 18, so as to exclude the tramways in Germany and its allies during the war. One hundred and twenty-eight members were present, including representatives from tramways in France, Belgium, Italy, Holland, Switzerland, Rumania, Denmark, Norway and other countries.

It was decided to adopt as the new name of the association, Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles. There will be four kinds of members as follows: Class A, companies operating tramway, interurban railway or bus systems; class B, officers, engineers or heads of departments of such companies; class C, manufacturing companies or associations, city or other organizations interested in the industry, and class D, individuals interested in the industry. The official language will be French, and the next convention will be held in Brussels during the first two weeks of October, 1922.

The following were elected members of the executive committee: C. de Burlet, Brussels; H. Géron, Brussels; J. Kessels, Brussels; Ch. Thonet, Brussels; A. Mariage, Paris; G. Pavie, Paris; Ch. Rochat, Geneva; Kai Norregaard, Copenhagen; Le Marquis de Foronda, Barcelona; F. Level, Paris; L. Boulle, Paris; J. W. van de Vegt, Rotterdam; J. F. S. Barth, Christiania.

A. S. T. M. Meets June 26 to 30

THE twenty-fifth annual meeting of the American Society for Testing Materials will be held at the Chalfonte-Haddon Hall, Atlantic City, N. J., June 26 to 30. Details of the provisional program will be published later.

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Tramway Conditions in France*

High Costs of Operation with Inadequate Fare Increases Have Greatly Affected Tramway Conditions—Tendency Now Toward Subsidized Service

By M. Guiffart
General Manager Compagnie Générale, Française de Tramways

THE war had a very depressing effect on all transportation enterprises in Europe because of increased costs and reduced travel. Economies in engineering and operating practice have offset this condition to only an insignificant extent. Increases in rates of fare appear to be practically the only remedy, but this remedy arouses the hostility of the public, and there has been a great temptation for communities to take over the property at depreciated valuations.

In Great Britain, where municipal tramway operation is particularly developed, wages were more than doubled during the war, in spite of the very considerable employment of female help. At the same time the cost of all materials rose rapidly. It was not until 1918 that a general law permitting fare increases was passed. Fortunately, the industrial activity in the cities where most tramways are located helped to overcome this effect, and by the postponement of maintenance and renewals the operators were able to keep on more or less effectively. The decrease in prices in 1921 has improved the situation, and as the British people seem to be able to pay high taxes without great difficulty, it is thought that the conditions in Great Britain are not and will not prove to be as serious in other countries.

In the United States, in spite of the late entry of the country into the war and in spite of more favorable financial conditions, the difficulties appear to have been even greater than in Great Britain. The same causes have increased expenses, but the systems are much more extensive, the cars are larger and heavier, and the expenses correspondingly higher. Moreover, the public was accustomed to a general unit fare of 5 cents, and any change in fares met with great opposition, particularly if toward the zone system. Nevertheless, fares have been increased on most roads and in some cases have gone as high as 10 cents. Some companies have discontinued service, some have become bankrupt, and the period of difficulty does not yet seem to be over for most of the companies.

In Italy the situation has become most critical, especially since the armistice, on account of labor troubles and the high cost of coal, which is furnished almost entirely from England. The government has intervened by legislation, the result being increased wages in favor of employees who were not usually underpaid, thus threatening the existence of many of the companies. The situation remains grave, and it can only be saved by the improvement of conditions legally imposed under exceptional war conditions.

It is difficult to obtain in France an exact knowledge of the tramway conditions in Germany and in the Central European states, on account of the crisis in the exchange of these countries.

As for the countries which remained neutral during the war, Holland, Switzerland and Scandinavia, if the condition of their transportation systems is not as bad as the others, it is certainly less favorable than in 1914.

Conditions in France

The accompanying table gives some statistics of a number of the principal systems in France outside of Paris. That city is omitted because during and after the war, the conditions there were special and were accompanied by a change in the franchise by which the authorities became responsible for deficits. Hence, comparisons can hardly be made with systems operating under the old form of franchise.

As shown in the first two columns of the table, traffic between 1913 and 1920 greatly increased in cities of an industrial character, while it has decreased in the commercial or agricultural centers, which attracted working population to a less extent, and whose population decreased during the war. This falling off in traffic from natural causes was intensified by successive increases in fare, made necessary by higher costs, and in some cases unprofitable service has been cut off.

Gross receipts have increased in a ratio which varies often between two and three, according to the importance of the system. At first, any increase in rates was strenuously opposed by the local authorities, but, since 1916, the law of Nov. 30, 1916, has simplified procedure in most cases and the Council of State has declared that the holder of a public franchise has the right to receive such returns as he had been reasonably able to expect when it was established from the moment when he finds himself deprived by circumstances impossible to foresee and the origin of which has resulted from a state of war.

This decision has been applied gradually in most jurisdictions and has saved from complete ruin a large number of enterprises. It has facilitated greatly the adjustment of fares to the extent made necessary by increased expenses, so that in a number of cities fares have now reached a limit which it is hardly possible to exceed in the circumstances.

Since 1921, the situation has been improving, due to the lower cost of materials. Some large systems, thanks to their higher fares, have been able to care for some deferred maintenance as well as pay fixed charges and some even show some surplus.

In general, however, the condition is not cheerful. Amortization of the past deficits and the cost of long accrued maintenance mean higher fixed charges in the future, while the high cost of money and the necessity of paying for renewals out of net income mean that for a company to have as stable a budget as before the war it should have an excess of receipts over operating expenses at least double that necessary in 1913. This result can be obtained in the near future only in exceptional cases. For the other properties it will be necessary either to increase the receipts or reduce the expenses, or obtain subsidies from the communities served. This last solution has been fairly popular in recent years among the city authorities because it offers a means of postponing difficulties, while ignoring the true cause.

There has thus come a series of purchases, with or without an operating lease to a private company, such as has taken place on the largest scale with the Parisian systems, and a number of municipalities have adopted the slogan "administration by those most con-

OPERATING STATISTICS OF A NUMBER OF FRENCH TRAMWAYS

Cities	No. of Passengers 1913	No. of Passengers 1920	No. of Kilometers 1913	No. of Kilometers 1920	Gross Receipts 1913 fr.	Gross Receipts 1920 fr.	Net Receipts 1913 fr.	Net Receipts 1920 fr.
Angers	5,041,866	4,835,110	1,336,215	1,062,630	627,350	1,423,775	294,865	26,290
Bordeaux	73,815,472	91,034,686	12,241,660	12,072,998	6,630,700	18,132,995	2,184,556	1,292,711
Brest	4,735,783	5,205,604	994,247	649,817	480,004	1,087,081	200,004	—179,999
Dijon	5,057,271	3,737,896	1,381,347	752,967	602,820	937,344	262,762	41,696
Le Havre	21,565,684	27,286,991	4,358,088	3,838,988	2,838,920	8,283,379	1,146,844	1,349,577
Le Mans	4,250,815	5,372,905	859,508	766,326	419,963	924,493	216,685	2,553
Marseille	112,579,169	162,488,596	22,853,675	27,469,135	11,781,120	32,681,387	4,113,799	—4,189,800
Nancy	17,651,442	18,198,158	3,988,689	3,959,186	1,999,604	4,783,115	930,545	482,106
Nice	22,103,664	19,968,732	3,678,130	2,971,437	2,515,643	5,164,095	788,431	580,787
Nimes	3,554,685	6,042,962	953,082	676,531	375,666	710,786	137,933	165,535
Oran	7,210,485	10,409,709	1,367,143	1,355,043	857,470	2,400,170	337,396	—672,114
Orleans	5,355,193	5,123,140	1,658,150	1,195,643	665,560	1,154,931	272,303	—633,911
Rouen	27,359,162	29,227,433	5,898,487	5,740,575	3,471,362	9,230,439	1,476,549	—470,217
Saint Etienne, Firminy, etc.	24,054,112	26,728,662	3,710,368	3,250,113	2,398,069	7,238,432	946,631	869,315
Toulon	14,552,601	22,398,825	4,177,540	4,854,417	1,703,745	3,849,339	692,191	586,118
Tours	6,215,045	4,936,645	1,912,737	1,308,107	791,825	1,774,034	245,331	99,599

Note: This table includes all properties given in Mr. Guiffart's table which carried 5,000,000 or more passengers in either 1913 or 1920.

*Abstract of paper at the second annual convention of l'Union des Voies Ferrées d'Intérêt Local et des Transports Publics Automobiles de France, Paris, Oct. 20-22, 1921.

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cerned." This policy, even when private operation is allowed to remain, has for its object the substitution of a system of joint control. When there is an excess of receipts, there is a division. When there is an excess of expenses, the city advances the necessary sum.

Conclusions

At present there are certain systems which have shown a vitality sufficient to offer some chance of continuing operation under the original form of franchise. But most companies favor the new plan, which assures an existence, although a mediocre one.

Developments along this line seem to call with the smaller properties for consolidations either along geographical lines or by classes of service. Under this plan the subsidies from the national government, the departments or states, or local communities can be obtained. As for urban tramways defraying the cost of construction, making payments to the cities for the use of franchises and paying dividends on their stock—that time has gone.

Chamber of Commerce to Hold Annual Meeting

Transportation will have a prominent place in discussions at the tenth annual meeting of the Chamber of Commerce of the United States to be held in Washington May 15 to 19. The general subject of the convention is announced as "European Conditions and their Effect on American Business."

Railroad questions will be dealt with in two group sessions, the first session having to do solely with domestic problems and the second with general transportation questions which have a bearing on foreign trade. The Railroad Group Session will be held on the afternoon of Tuesday, May 16. The general topic for consideration will be, "Experience under the Transportation Act, 1920," with especial reference to the rate-making provisions and the financial provisions of the act.

New York Electric Railway Association

AT A recent meeting of the executive committee of the New York Electric Railway Association it was decided to hold the fortieth annual meeting of the association at Hotel Champlain, Bluff Point, Lake Champlain, on Saturday, June 24.

Committees appointed at the executive committee meeting include the following: B. E. Tilton and W. O. Wood, committee on speakers; Carl H. Beck, chairman of the entertainment committee; H. B. Weatherwax and A. E. Reynolds, committee on hotel arrangements.

American Association News

Executive Committee Meets in Baltimore

John W. Colton to Be the New Editor of "Aera"—Past-Presidents' Badges for Affiliated Associations — National Relations Committee Busy — Next Meeting of the Committee to Be Held in Montreal on May 31

A MEETING of the executive committee of the American Association was held in the offices of the United Railways & Electric Company of Baltimore on Friday, April 28.

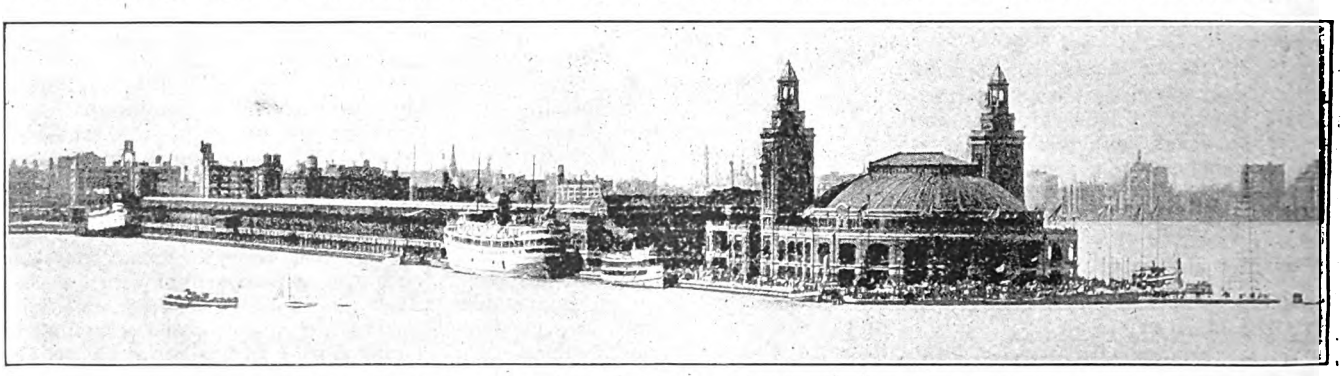
In his report for the committee on national relations, Mr. Henry told the committee at some length the situation regarding the Bacharach bill and the hearings which had been held on this bill. At most of the hearings so far conducted, the principal witnesses who have been heard have been those in favor of the passage of the bill, the last to appear being Mayor Hylan of New York. Recently the committee has been hearing from some of the state commissioners who have pointed out the danger of driving capital away from investment in public utilities in case this bill is passed. Mr. Henry also referred to the Interstate Commerce Commission's study of the question of power brakes, which, however, will probably not affect electric railways. The next hearing on this question will be held on May 17.

Mr. Henry also called attention to the fact that most electric railway companies seem not to comprehend the function or the availability of the committee on national relations in its service to individual companies. The Interstate Commerce Commission and other bodies require that various railway companies coming under their jurisdiction should maintain "representatives" in Washington. So far as Mr. Henry can ascertain, these representatives are necessary merely for the purpose of providing someone on whom papers and notices may be served and to this extent the committee on national relations of the association is available without charge to any member company of the association. The executive committee authorized Executive Secretary Welsh to call this fact to the attention of the members of the association.

Reporting for Mr. Emmons, chairman of the subjects and meetings committee, Mr. Palmer outlined the tentative program which the committee had prepared for the October convention in Chicago. The committee is not yet prepared to announce a definite program, of course, but its general plans are to devote the Tuesday session to the relation of the electric railway to the rest of the industrial life of a community and to its social development, and to questions of public relations and publicity. The Wednesday session, it is planned, will be devoted to a consideration of some problem from a national viewpoint by some nationally prominent speaker; there is planned a past-presidents' forum and possibly some discussion of trackless transportation. On Thursday the general subject will be finance and economics from several standpoints—the general financial and economic situation of the railways, fare systems, securities and customer ownership. Details of the program will be announced later.

The report of the publicity committee dealt largely with the work in connection with the co-operation of manufacturers, following the plans of the committee on this subject headed by Mr. Wickwire.

Secretary Welsh presented the report of the publications committee by Mr. Storrs, the chairman, who was unable to attend the meeting. The principal point in this report was that the com-



MUNICIPAL PIER IN CHICAGO, WHERE THE 1922 CONVENTION WILL BE HELD

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mittee had, after a thorough canvass of the field, made arrangements with Mr. Colton to undertake the editorship of *Aera*. More extensive announcement of this appears elsewhere in this issue.

As recommended by a committee headed by Mr. Stevens of the finance committee, and having as its members the presidents of the four affiliated associations, the executive committee authorized the purchase of past-presidents' badges for all of the past-presidents of the affiliated associations. An acceptable design was offered by the committee and adopted by the executive committee. This design is to be common to all of the affiliated associations, and consists of the design of the pin of the association embossed on a pendant with the words "past-president" above the pin design and the name of the affiliated association below this. This design is a pendant from a single bar which carries the name of the past-president and the date of his incumbency in office. These badges will be of gold.

President Kimball of the Engineering Association reported progress of the engineers on activities in the various states on overhead specifications. Mr. Hecker, special engineer, is now following these various hearings and making a study of the situation in so far as it affects electric railways. It was pointed out in the discussion on this subject that the electric railway industry is not functioning as a unit on this subject, and that there should be more publicity to the fact that when hearings start in various states the association headquarters should be notified by local companies so that the facilities of the association headquarters may be placed at the disposal of the various companies in presenting their cases before commissions on this question.

The president was authorized to appoint a special committee to consider the question of drawing up a model law for the regulation of motor vehicles.

Accepting the invitation of Mr. Gaboury of Montreal, the executive committee decided to hold the May meeting in Montreal on Wednesday, May 31, the day preceding the convening of the Canadian Electric Railway Association at Quebec. (Details of the program of the convention will be found on page 755 of this issue of the ELECTRIC RAILWAY JOURNAL.

After the meeting adjourned the members of the committee were entertained by the officials of the Baltimore company at a lunch at the Country Club.

Highway Committee Forming

A COMMITTEE on cost of construction and maintenance of highways is being formed by the American Association and the personnel will be announced shortly.

This subject is considered important because it has an intimate relation with the transportation of passengers by motor and trolley bus and transportation of freight by motor trucks.

Claims Association Outlines Program

President Rice Points Out, in Communications to Association Members, the Need for Active Interest in Association Work

PRESIDENT CECIL G. RICE of the American Electric Railway Claims Association is conducting an active campaign to increase interest in the Chicago convention of that association and make the organization of greater value to the claims departments of the different companies.

On April 13 he addressed a letter to the claims directors of member companies in the American Electric Railway Association pointing out various salient facts regarding the annual cost of accidents in the United States and the amount of this expense on electric railway lines. This latter figure was given as $50,000,000. Mr. Rice also said that the percentage of these costs to the gross receipts for different companies varied from 2 per cent to 17 per cent. These differences, he declared, are not the result of luck or chance, so that the need for the exchange of experience such as is possible in the association is evident.

He declares that the successful claims director is keen, alert, well informed, friendly, sympathetic and above all a good business executive. The Claims Association convention offers him the one big opportunity to absorb the wholesome atmosphere of understanding in a clearing house of claims troubles and experiences. It is up to him to participate or to his company's superior official to direct his attendance and participation. The best interests of the company demand it.

In his second letter, sent out April 24, he solicited suggestions from claims members of the association as to (1) topics to be considered at the Chicago convention; (2) practice upon which experience data from other companies can be collected, analyzed and recorded; (3) suggestions for broader and new activities of the association, and (4) changes, additions or approval of past plans, procedure, policies and control. To aid in such suggestions he outlined the problem as follows:

Claims Department: (a) Prevention of accidents, (b) discouragement of claims, (3) investigation of accidents and of current and litigated claims, (d) adjustment of current and litigated claims, (e) clerical records.

Medical: (a) Examination of injured, (b) examination of claimants, (c) examination of litigants, (d) testimony at trial.

Legal: (a) Advice and opinions, (b) preparation of suit, (c) trial and defense.

Mr. Rice's second letter concludes as follows:

> If you have attended past conventions, what was done that you did not like? What would you like done? What would attract you to and most interest you at the convention? What could be done to make it easier for you to secure executive approval for attending the convention?
>
> This association belongs to the members. You are one of the members. Exercise your ownership. Whatever you write in confidence will be so held. If I can open the doors any wider tell me how. Meet me half way. I have started. Come on.

An outline of the plans for 1922, as prepared by him, is reproduced.

OUTLINE OF PLANS FOR AMERICAN ELECTRIC RAILWAY CLAIMS ASSOCIATION, 1922

1. Register accredited representatives to Claims Association by all member companies of the American Electric Railway Association.
2. Overcome dissatisfaction and satisfy complaints.
3. Increase interest of { active members / inactive members.
4. Interest { representatives of medical departments / representatives of legal departments } { associate activities / convention attendance.
5. Increase membership through associate members from non-member companies.
6. Learn the { association desires / claims problems } of all members.
7. Arrange { instructive / interesting / entertaining } convention program for { claims directors / legal representatives / medical representatives } on basis of greatest good to greatest number.
8. Make { statistical / experience / practice } surveys of matters requested.
9. Make office of direct service and clearing house for Claims Association members.
10. Convince higher officials of member companies of the benefit resulting from their claims director's { association activities / convention attention } { to company. / to claims director. and assistants. / to legal department. / to medical department.
11. Index subjects of past conventions and make them available for reference.
12. Develop accident prevention. Reduced claims cost will follow.
13. Strike at exorbitant contingent fees. They are the root of ambulance chasing, litigation, exorbitant verdicts and high claims cost.
14. Dignify and broaden the objects of the Claims Association.
15. Commence and continue preparation of a Claims Association code.
16. Analyze official experience during association year and recommend plans for future increased association efficiency.
17. Consider honor award for claims efficiency similar to "Rice Safety Award."
18. Co-operate with { affiliated associations. / National Safety Council. / American Society of Safety Engineers. / Association of Railway Claim Agents (steam roads). / International Claims Association (insurance). / National Electric Light Association. / American Gas Association.

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Recent Happenings in Great Britain

Peace in Tramway Industry—Electrification Prospects—Glasgow Subway Sale Off

(From Our British News Representative)

SERIOUS labor disputes have broken out in the British engineering and shipbuilding trades, but there are prospects of continued peace in the tramway industry. It may be recalled at a previous meeting of the National Joint Council for the industry several questions as to conditions of labor remained unsettled. During March, however, the Council succeeded in coming to an agreement. With regard to hours of work, the average duty schedule will be forty-eight hours per week of six days. No duty will be less than forty-four hours nor more than fifty-two. As to spread time, each tramway authority will deal with the matter in conference with the local representatives of the trade union. With respect to the vexed question of a guaranteed forty-eight-hour week, it was agreed that all employees hitherto entitled to the guarantee in question will retain it provided that they present themselves for work at the appointed time each day.

Terms of Agreement Summarized

This is subject to the condition that in the event of a stoppage of a tramway service from causes beyond the control of the tramway authority the guaranteed week will be suspended and only the actual time worked will be paid for. In the event of a partial stoppage, the tramway authority will consult the local representatives of the trade union with a view to dividing the work equitably among the employees. With regard to new entrants into the service, who are not to have a guaranteed 48-hour week, their number must not exceed 10 per cent of the total employed, and they will have a guaranteed week of thirty-two hours. In the event of a spare man being called out, he will be paid a minimum of four hours for the first call and two hours for each succeeding call in the day. Eight days holiday per annum with pay were agreed to, as was also a stipulation that Christmas Day shall be worked when required, double pay to be given for the time actually worked, with a minimum of four hours. To meet the case of small undertakings, some of these provisions may be modified by local consent. The whole scheme was recommended to the constituent bodies for acceptance, and there is every prospect that it means a general settlement.

A month's strike of Newcastle tramway employees ended recently by the men giving in. They had the special privilege of a forty-four-hour week, and when the Town Council sought to change it to a forty-eight-hour week, so as to bring the time of work into conformity with that on other tramway undertakings, the employees struck.

During the latter part of March several brief announcements were made on behalf of the government in the House of Commons in regard to the application by the London underground electric railway companies for a state guarantee, under the trade facilities act passed last autumn, of principal and interest on a loan proposed to be raised by the companies for carrying out extensions and improvements. The first announcement was that the British Treasury had agreed to guarantee the loan, the underground companies having estimated that 15,000 to 20,000 men would be provided with work for from eighteen to twenty-four months on construction. The next intimation was that the Treasury guaranteed the principal and interest on £5,000,000 of debentures to be issued by the London Electric Railway and the City & South London Railway. The third installment of information, details being withheld as negotiations were not complete, was that the capital would be raised by a public issue of debentures.

In regard to the electrification of more of the suburban lines of the railways heading out of London to the south, the process seems likely to be expedited by an arrangement reached by the three companies concerned. These companies, the South Eastern & Chatham, the London, Brighton & South Coast and the London & South Western, are to be grouped into one company under the railways act, so that a general arrangement regarding electrification is desirable and indeed necessary. The South Eastern & Chatham electrification expenditures is estimated at £5,800,000; the first stage of the work will cover 210 miles of single track. The London, Brighton & South Coast Railways estimated for converting all its suburban lines is £10,000,000. More than 100 track-miles have already been electrified, and present projects point to 300 track-miles more.

Speeding Up at Underground Stations

As the result of an experiment extending over three months at Kilburn Park station on the London underground electric railways, the use of a booking apparatus called the passimeter is to be extended to eleven other stations on the underground system. Time-saving is the object in view, and this is of special importance during the morning and evening rush hours, which are more concentrated and, therefore, more overwhelming than ever before. The passimeter arrangement involves the use of three separate registering cyclometers, two of them automatic and one non-automatic. The first registers the dating and cancellation of each ticket, setting the passenger free to proceed through the passimeter, which is an elaboration of the ordinary turnstile. This operates another cyclometer which automatically records each individual's passage. With the third cyclometer the booking clerk registers the passage of season ticket holders. From the passimeter the passenger goes on to the station platform without any ticket examination at the customary barrier. The whole arrangement at Kilburn Park is worked in conjunction with an "automaticket" machine. By the pressure of a small plunger the booking clerk can issue any number of tickets up to five of any one denomination.

Quiet Station Chosen for Experiment

Kilburn Park station, where the experiment was carried out, is a comparatively quiet one, and was chosen for this reason. Some of those to which the scheme is being extended are among the busiest. The volume of traffic (inward) handled at Kilburn Park during the three months exceeded half a million passengers. The ticket on being presented to the passengers is instantly dated, examined and punched by the machine provided. By a careful study of the rate at which passengers are booked at an ordinary booking office window at underground stations, compared with Kilburn Park, it has been found that eleven passengers per minute are dealt with by the old style and thirteen in the case of the new style. What is perhaps of more importance than this 16 per cent saving in time is the further saving owing to there being no ticket examination barrier. The analysis shows that 70 per cent of passengers require change and that the major delay at booking offices is tnat of change giving. A machine has been designed and will be tried at Kilburn Park; in this a push button labeled with the requisite change will be operated by the booking clerk; the machine will instantly release the proper change onto a counter trough in front of the passenger.

Glasgow Subway Purchase Negotiations Off

The negotiations for the purchase of the Glasgow Subway by Glasgow Town Council have broken down because the price asked by the Subway Company was much in excess of what the corporation was willing to pay. The latter offered £300,000. It may be recalled that the subway is in the form of a circle about 6 miles in circumference and serves the central, southern, western and northern districts. The report of the subway company for 1921 showed a loss on working of £39,287, due to the excessive cost of coal, cables, and materials. At the annual meeting of the company it was mentioned that to convert the line to electric traction would cost £100,000. As a consequence of the failure to conclude the negotiations it was decided that the undertaking should close down on March 26.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Agreement Reached

New Orleans Council Approves Compromise Arrangement with Local Company

The compromise ordinance introduced by Commissioner Paul Maloney of the Department of Public Utilities in the New Orleans Railway & Light Company matter has been adopted by the Commission Council on motion of Commissioner of Finance Murphy. The vote of Mayor McShane was the only one recorded against ratification. Nothing now stands in the way of proceeding with the reorganization of the company but compliance with the rules of procedure which have already been outlined in these reports.

MALONEY STOOD FOR ACCEPTANCE

Among the principal provisions incorporated in the settlement ordinance are the following, very briefly summarized:

Valuation of the property, as of Dec. 31, 1920—$44,700,000, of which $25,000,000 is allocated to the railway department.

Rate of return to company on this valuation, and on any new money invested in the properties, 7½ per cent flat.

Actual disbursements to security holders limited to 6½ per cent.

A reserve fund of $300,000 to be created each year, either out of earnings or by issuance of new securities, subject to the approval of the Commission Council, half of which is for improvements to the property and half for the refunding of 4½ per cent bonds.

The outstanding obligations of the company of more than a year's extent at no time to exceed the rate base.

Holders of 4½ per cent bonds in return for yielding their preferred position to receive 25 per cent of the par value of their bonds and 75 per cent of the value in new securities.

Carfare to be reduced to 7 cents for a test period of a year, and gas to $1.30 as soon as the reorganization is effected, and the new rates maintained for a sufficient period to determine whether the property can be operated on that basis.

The city to hold a perpetual option on the property at the valuation as of Dec. 31, 1920, plus any additional investments.

The city to supervise all new securities issued.

Dividends on the common stock not to exceed 8 per cent a year cumulative or 9 per cent in any one year if necessary to effect the sale of stock at par for financing purposes.

Commissioner Maloney stood out stoutly for the acceptance of this plan. He pointed out that while the city had gained a victory over the state with respect to the power of the city over rates, this was only a theoretical advantage as in the last analysis the company could resort to the courts for relief from conditions which in its opinion might be intolerable to it. Thus while it was definitely settled by the State Supreme Court that the right to make rates adhered in the city, still in a suit brought in the federal court the city was restrained from interfering with the collection of an 8-cent fare or any other fare necessary to produce a fair rate of return upon a fair value of the property. Such an injunction was actually issued at the instance of a federal district judge. While the city appealed the case on the ground that the rate of fare in a franchise is an inviolable contract, the United States Court of Appeals affirmed the judgment of the district court.

In arguing on from these facts Mr. Maloney said in part:

From these decisions it appears that unless we effect a compromise we will be forced into court on the question purely and simply of a rate making body contesting the present charges that are now being levied by the utilities. This would mean evidence as to value of the property and what constitutes a fair rate of return on such valuation.

From recent decisions and the history of this particular matter, we cannot take encouragement, and I would submit that it is the serious duty of this Council to weigh carefully the question of compromising the disputes or continuing in court, because, if we permit ourselves to be parties to the litigation and the people of the city are given a decision that would force a settlement inferior in its allowance to a settlement that could be obtained by a compromise, the responsibility must fall upon the shoulders of this Council.

No matter what our desires may be to reduce the charges that the utilities are now assessing, we must fully appreciate that our powers are limited and our actions always subject to a review by the court.

In the settlement plan, we have obtained a great many concessions that would positively be lost in court proceedings, as the only matter the court could pass upon would be the value of the property and the rate of return and what would be fair charges to yield such a rate of return.

The details of the proceedings looking toward the lifting of the receivership will now be taken up. They are referred to elsewhere in this issue, as are also the general terms decided upon for the rearrangement of the capitalization of the company under the new agreement.

Maine Men Accept 10 per Cent Cut

Motormen and conductors of the Portland (Me.) Railroad and allied lines have voluntarily agreed to accept what amounts to practically a 10 per cent reduction in wages for the year beginning May 1, 1922, in order to enable the road to make up a deficit in its earnings.

The present wage scale is 60 cents an hour for the operators of one-man cars, and 55 cents an hour for conductors and motormen on two-men cars, and the average day covered by these employees is of the nine-hour variety. The cut for operators of one-man cars would therefore be from $5.40 to approximately $4.90, and for opertors of two-men cars from approximately $5 to $4.50 a day.

During the year 1921 the deficit in the earnings of the Cumberland County Power & Light Company, which controls the Portland Railroad, was $63,000, a far smaller deficit than that which appeared on the books in preceding years.

Another M. O. Experiment

Ohio City of 25,000 Will Run the Local Railway System After July 1—$100,000 for Improvements

Ashtabula, Ohio, is the latest city to vote in favor of municipal ownership of its street car lines. At an election held there on April 24 the voters approved the purchase of the property of the Ashtabula Rapid Transit Company for the price of $150,000. Fewer than 3,500 votes were cast. The plan was approved by a majority of 856. Ashtabula is the first city in Ohio to own and operate its own street car line. Transfer of the property is expected to take place by July 1.

City officials say that they plan to spend at least $100,000 on new equipment and improvement of the road bed as their first effort to give better service under municipal ownership. The purchase of at least six one-man safety cars, so as to permit 10- or 12-minute service, is contemplated.

Ashtabula street car troubles date back to the '80s, when the old horse-car line of John N. Stewart was put out of business by Councilmen and city officials who, during the night, literally tore the rails from the streets.

Before the World War, the Ashtabula Rapid Transit Company was able to give reasonably good service at a 5-cent fare. At that time the line represented an investment of about $300,000. When the war came and prices soared, the railway found it impossible to give adequate service at a 5-cent fare. A 7-cent fare was asked by the company, but was rejected by the City Council, which did, however, grant a 6-cent rate. The people failed to approve this increase at a referendum election.

The company continued operation, but the high costs of labor and materials hurt operation. Then the company went into the hands of Charles Currie and A. R. Raymer, Pittsburg, as receivers. Backed by a court order, the receivers were able to get the fare raised to 8 cents.

This was followed by agitation for municipal ownership. Arrangements were made to sell the property to the city for $296,000. This offer was accepted by the city and ratified by the people, but owing to the impossibility of finding a market for the bonds, the deal never went through. Last summer agitation for municipal ownership was again renewed. The receivers then offered to sell the property for $197,000, but the voters rejected this proposition. During the past winter the stockholders in the defunct railway started another agitation with the result that the property was offered to the people for $150,000. This is the offer that has now been accepted.

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Pittsburgh Scale to Continue Another Year

The last differences on wages and working conditions between the receivers of the Pittsburgh Railways and its employees were reported settled on May 2 at a conference of the receivers and the union wage scale committee. Earlier in the day, after a second meeting of the employees to ballot on wage proposition, it was announced the men had voted almost unanimously to continue for another year at their present wages.

These are: 54 cents an hour for the first six months' service, 58 cents an hour for second six months and 60 cents an hour after the first year. The average day is nine hours.

A few slight changes in working conditions, requested by the men, will be made in the new agreement, it was announced.

The total vote was. For compromise on present wage, 2,136; for arbitration of dispute, 8; for accepting proposed wage cut, 0.

Offer Accepted—Strike Averted

By accepting the company's wage offer railway employees of the Dominion Power & Transmission Company, Hamilton, Ont., have averted a strike which threatened to leave Hamilton without car service and throw 25,000 men out of work. Men employed on the suburban radial lines and the steam and electrical engineers in the power houses voted against acceptance. The railway vote was in the majority which prevailed.

Acceptance of the company's offer means that the men have consented to take considerably less than was recommended for them by the majority award of the Board of Conciliation. About two months ago the company enforced a general wage reduction averaging 12½ per cent. The majority award of the Board of Conciliation provided for an average reduction of about 4 per cent. Acceptance of the company's offer provides for the employees of the power houses taking wage reductions averaging 6 per cent, and the crews of the suburban radial lines and the street railwaymen taking a cut averaging 8 per cent.

Lew Shank Advocates Municipal Ownership

Mayor Lew Shank of Indianapolis has come out as an advocate of the purchase by the city of Indianapolis of the principal utility companies' properties in the city, among them the Indianapolis Street Railway. He proposes to take personal charge of a fight before the next session of the Legislature for the enactment of a constitutional amendment that will permit the city's bonded indebtedness limit to be increased from 2 per cent of the tax valuation to 10 per cent for the specific purpose of bringing about municipal ownership and operation of the utility companies' plants.

While it came as a surprise, the announcement was not entirely unexpected, for the Mayor has been in a continuous squabble with the various utilities and the Public Service Commission since he took office the first of this year. About six weeks ago, he lead an "army" to the statehouse where he harangued the Public Service Commission for permitting an electric power merger. At that time he advocated the repeal of the law creating the Public Service Commission.

Reorganized Company Secures New Operating Rights

A new franchise for the Lafayette (Ind.) Street Railway, Inc., has been granted by the city of Lafayette, West Lafayette and Tippecanoe County. The company has ordered new equipment with which to rehabilitate the entire system. The new city franchise authorizes several changes in routes, the curtailment of several non-productive lines and the right to run a track on Eleventh Street to connect with the site of the carhouse where a new traction terminal is to be built. A new carhouse will be built for the city lines on a site formerly owned by the Ft. Wayne traction line. The county franchise permits the new company to operate over the main street bridge across the Wabash River without paying a fee. The old company paid $5,000 a year for the privilege. The franchise granted by West Lafayette provides for new routes, double tracking to improve service to Purdue University and abandonment of the loop that encircles the northern portion of the town. The equipment ordered includes fifteen one-man cars. New rails and ties also have been ordered.

New Pension System in Effect

A new system of pensioning employees in the service of the United Railways & Electric Company, Baltimore, Md., went into effect on April 1. Under the new arrangement terms of service rather than earnings of the men will be the controlling factor in allotting pensions. The plan also provides a minimum monthly payment and the result of this is to increase the payments that have heretofore been made to men who drew less than $30 a month. The men now receiving less than $30 a month will be paid $30 a month and those receiving more on the present basis than will be allowed under the new rule and regulation will continue to receive the present rate of pension.

Trolley Topics for April explains the plan in detail. It says:

> Those in continuous service twenty years and less than twenty-five years—$30 per month.
>
> Those in continuous service twenty-five years and less than forty-five years—$30 per month for twenty-five years' service and an additional dollar per month for each year of continuous service above twenty-five years.
>
> Those in continuous service forty-five years or more—$50 per month.

The plan is beneficial to all, especially honor roll men and prospects for that distinction.

New Franchise Agitated for Fort Wayne

Until some reasonable agreement is reached in the matter of rates the Indiana Service Corporation will not sign a new franchise with the city of Fort Wayne. This is the decision of President Robert M. Feustel of the company.

The city through Mayor Hosey has been endeavoring to get the company to agree to a new franchise. At present the company is operating under an indeterminate permit from the Indiana Public Service Commission, having surrendered its franchise some time ag

The latest attitude of the city is that before it grants permission to the company to double track its line on Pontiac Street the new franchise must be signed.

As the company understands the proposal from the city it is that the Indiana Service Corporation shall agree to accept the old 1902 franchise in case that any action of the Legislature or the courts repeals or annuls the public utility commission law. Under the terms of that ordinance the company was required to operate at a 5-cent cash fare and sell six tickets for a quarter.

In replying to the Mayor Mr. Feustel said:

> You know, of course, that with present wages and present cost of materials there is no possibility of giving railway service at that fare. No long term franchises have been written in any city for the past twelve years at least, where a city has agreed to accept a definite fare over a long period of years. The impossibility of fixing a definite selling price with changing costs is self-evident and no one contends for such an arrangement in these modern times.
>
> We are perfectly willing to continue to operate under the old 1902 franchise except in the matter of fares and for that item we are willing to make any reasonable arrangement which will fix the fare so that operating expenses and taxes and a fair return on the actual money invested is provided for in any rate of fare that is suggested. Less than this amount no court would allow and it merely means an arrangement whereby we agree how this fair return should be based.
>
> We are attempting to draw a paragraph to cover the method of determining the rate of fare and will submit this matter to you as promptly as possible.
>
> Early action on the franchises before the board of works is very important if the Fort Wayne railway patrons are to be adequately served.

Mr. Feustel declared that the cost of double tracking Pontiac Street the full length of the street would be at least $100,000.

Railway Remains Firm

Officials of the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, have made formal answer to the request of the union for the appointment of a board of five arbitrators to settle wage differences. The letter states that the company will not deal with the men as an organization and reiterates the gist of the communication of March 27 addressed to each employee. This letter stated that either individually or collectively the company would confer with the men on the wage contract, expiring on May 1, but that it would not deal with the employees through the medium of any labor union.

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New Grant Almost Ready

Finishing Touches Being Put to New Thirty-Year Franchise for Grand Rapids Railway

Members of the City Commission and officers of the Grand Rapids (Mich.) Railway are arranging for a meeting to be held soon, at which the complete text of the new railway franchise draft will be discussed.

Since the draft was announced as completed by Stuart E. Knappen, attorney for the railway, and City Attorney Taggart, it is reported that to the clause providing for an 8 per cent return on the value of the company's property there has been added another clause which provides for a bonus for the company's employees. This bonus is to be pro-rated according to the employee's wages or salaries, but does not include the administrative officers. A sliding scale of fares is proposed on the service-at-cost plan, with an equalization account starting at $200,000.

OFFICIAL COMMENTS ON BONUS PLAN

The bonus clause provides:

The grantee's initial rate of return on the value of its property, as determined under section 12 of this ordinance, shall be 8 per cent per annum. The grantee's rate of return shall be decreased one-fourth of 1 per cent whenever the rate of fare shall be increased one step as hereinafter in this section defined, when the cash of ticket fare in effect shall be 5 cents or less, the employees of the company shall receive one-fourth of 1 per cent on the value of the company's property for rate making purposes as a bonus, to be prorated according to their wages or salaries, but not including those of administrative officers and the return of the company shall also be increased one-fourth of 1 per cent, providing that the increase to said employees shall be first made before any increased return to the company.

Naturally this provision has provoked some comment. Caution is urged, however, in passing judgment on it. Thus L. J. De Lamarter, vice-president and general manager of the company, is quoted as follows:

The bonus plan is a subject of such importance that snap judgment on it could not and should not be made. The railway management has been for some time considering different plans for reward to employees for efficient service, and a bonus plan would be one of the natural plans to consider, although there might be certain other plans which we have been working on that would possibly be far more satisfactory to our employees than a bonus plan, and the city and company will doubtless be able to work out something that will prove satisfactory to all concerned. I can not discuss the latest plan proposed until after I see and analyze it.

The franchise draft also includes a sliding scale of fares depending on the earnings of the company. The initial fare is to be 10 cents cash or seven tickets for 50 cents, but the fare may vary from a low of 5 cents cash with eleven tickets for 50 cents to 10 cents cash and five tickets for 50 cents.

REPORTS TO BE SUBMITTED

As has been the custom since the first increase of fares in December, 1918, the company is to furnish the city with a monthly report. City officials are to have access to the books of the company to confirm such reports. A budget for the following year to be approved by the city must also be furnished by the company and construction work and expenditures of the company must be under the supervision of city officials.

The city reserves an option to purchase the company's property at the end of fifteen years, or at the end of any five-year period. The railway must pave between the tracks and for 12 in. on each side of them.

The franchise is for a period of thirty years.

Included in the new franchise is a clause giving the city the right to order extensions of service, and public hearings shall be given on all such cases. In case the company is dissatisfied with such an order, it can appeal to a board of arbitration.

Wage Reduction of Five per Cent Announced

A new wage scale affecting trainmen of the Cape Breton Electric Company, Sydney, N. S., went into effect on April 1. The schedule in cents per hour is as follows:

First six months	35
Second six months	36
Second year	38
Third and fourth year	40
Fifth and sixth year	42
Seventh and thereafter	44

This makes two wage cuts which have been made by the company, the first one having been put into effect on May 1, 1921, at which time all employees both daily men, monthly men and officials were cut approximately 8 to 10 per cent.

Prior to May 1, 1921 wages of trainmen were as follows:

First six months	40
Second six months	42
Second year	44
Third and fourth year	46
Fifth and sixth year	48
Seventh and after	50

In submitting the bulletin to the trainmen announcing the wage reduction, C. C. Curtis, manager of the property, said that riding on the cars had fallen off tremendously and that there seemed no immediate prospect of any great improvement. He said that for the whole company including all departments, and in the two months of January and February, 1922, the company failed by $29,825 to pay interest charges on the bonded indebtedness. He explained further that the present reduction amounted to only 2 cents an hour which "seems very mild as compared with some others which have been made in other industries."

Men Granted Board of Conciliation

The Department of Labor, Ottawa, has notified the London (Ont.) Street Railway and its employees to name their representatives for the Board of Conciliation which will take under advisement the matter of wages. The union had asked for a board of conciliation to settle the dispute arising from the 3-cent reduction effective on March 1. Reference was made to the union's application in the ELECTRIC RAILWAY JOURNAL, issue of March 25.

Wage Issue Unchanged

The question of a new wage and working agreement for the employees of the New York State Railways in Schenectady, Utica, Syracuse and Rochester continues unchanged, with both sides sparring for an opening. By an overwhelming vote the men in Rochester, Syracuse and Utica on April 26 rejected the proposed wage agreement of the management because of changes in working conditions which they say would have been detrimental to them. President James F. Hamilton and officials of the railway insist that separate agreements and conditions shall cover the different sections involved.

In Schenectady the union on April 29 by a vote of 166 to 84 decided to retain as president Walter Walker and as business agent Michael Ward, in the face of the company's ultimatum that no delegation of workers would be received which included these two men.

A conference between Mr. Hamilton and members of the Joint Conference Board of the Amalgamated Association representing Rochester, Syracuse and Utica, headed by John H. Reardon, member of the international executive board of the union, was attempted in Rochester on May 1, but was indefinitely adjourned after Mr. Hamilton had reiterated his unwillingness to meet a committee including Walker and Ward of the Schenectady division of the union.

At the opening of the conference Mr. Hamilton was asked by Mr. Reardon if he would consent to include a committee from Schenectady in the conference, the request including a statement that the Schenectady division recently had given its president and business agent a vote of confidence. Mr. Hamilton replied he was willing to meet any committee from the Schenectady division that did not include Walker and Ward, but he preferred to meet such a committee in Schenectady. He also expressed the desire that negotiations for wages and working conditions in Schenectady be conducted separately from those concerning Rochester, Syracuse and Utica.

Wage Agreement Renewed

By mutual consent of the public trustees of the Eastern Massachusetts Street Railway, Boston, Mass., and the union composed of the road's employees, the wage and working agreement in force, founded upon an award of the State Board of Arbitration and Conciliation in 1921 and which would have expired on May 1, has been extended for another year.

The basic wages of the operators are 49 cents an hour for the first three months' service; 52 cents for the next nine months and 54½ cents thereafter, with 5 cents an hour additional or a maximum of 59½ cents an hour for one-man car operation. As more than 95 per cent of the cars are one-man type, nearly all operators receive the maximum of 59½ cents an hour.

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Wages Reduced Two Cents an Hour

A reduction is ordered of 2 cents an hour in the scale set forth in Section 8 of the agreement dated Aug. 16, 1921, between J. H. McClure, receiver of the Indiana, Columbus & Eastern Traction Company and the Amalgamated Association, and in Section 8 of the agreement of Aug. 16, 1921, between P. A. Berry, receiver of the Columbus, Newark & Zanesville Electric Railway, and the Amalgamated Association. The wage scale thus fixed is made effective as of Feb. 15, 1922, and continues in effect for a period of six months from and after Feb. 15, 1922, in accordance with the agreement of Feb. 4, 1922, called an arbitration agreement entered into between the receivers, respectively, and the divisions, respectively, previously mentioned. The wage scale (in cents per hour) fixed by this award is as follows:

Interurban Lines	
First three months	36
Next nine months	41
Second year	47
Freight brakemen	34

One-man car operators will receive 3 cents an hour additional to the base rate.

City Lines	
First three months	34
Next nine months	39
Second year	44

One-man car operators will receive 3 cents an hour additional to the base rate.

The arbiters in the dispute were C. W. Rich, Springfield, representing the trainmen; S. D. Hutchins, Columbus, representing the company, and Prof. George Rightmire of Ohio State University, Columbus, as umpire. Mr. Rich dissented from the finding. Both companies were represented at the hearing by J. H. McClure, receiver Indiana, Columbus & Eastern Traction Company.

The decision settles a controversy of more than two months standing as both sides had previously agreed to stand by the board's decision. The old wage scale expired on Feb. 15, at which time the company proposed to reduce wages 4 cents an hour. This scale was rejected, but, pending arbitration the men agreed to accept the following scale (cents per hour), the award of the board to be retroactive to Feb. 16:

	City	Interurban
First three months	32	34
Next nine months	37	39
Second year	42	45

The arbitration was on wages only, the wage agreement having expired on Feb. 15, 1922. The scale in cents per hour up to that time had been:

	City	Interurban
First three months	36	38
Next nine months	41	43
Second year	46	49

Certain Franchise Provision Null and Void

Certain provisions of the new Fresno franchise conflict with powers conferred on the California State Railroad Commission relating to the fixing of rates and are null and void, according to a statement of Chester H. Rowell, a member of the commission, who informed representatives of the city of Fresno and the Fresno Traction Company on April 21. Application was made by the traction company to abandon its present franchises and substitute the resettlement franchise. The franchise which the city has granted is known as the cost of service type and provides for an annual adjustment of fares which shall be allowed on "capital value." It also provides that the traction company shall be permitted to earn 8 per cent.

Commission Approves of Changes

The California Railroad Commission recently granted five petitions by the San José & Peninsular Railroads, San José, Cal., including abandonment of franchises, suspension of operation and a re-routing application. In its statement the commission said that the continuation of branch lines where such a great disparity exists between the operating revenues and the cost of conducting such operation results in an undue burden being placed on users of the transportation system and militates against the company's ability to serve.

Offer Rejected

Employees of the Syracuse & Suburban Railroad, Syracuse, N. Y., recently voted to reject the wage scale of 42 cents an hour offered by the company. The present scale is 45 cents and the men had asked for an increase to 60 cents. The company originally asked for a cut to 30 cents an hour, but this was later modified to 35 cents and then to 40 cents. At a recent conference between the company and union officers the company offered 42 cents.

Compensation for Joint Use of Track Being Determined

The Wisconsin Railroad Commission has been holding hearings on the petition of the Chicago & Milwaukee Electric Railway and the Milwaukee Northern Railway, both operating city lines in Milwaukee, Wis., to determine a fair basis of compensation for the use of the tracks owned by these companies on Wells Street in Milwaukee, Wis., and jointly used with them by the Milwaukee Electric Railway & Light Company. The commission some months ago, as a result of a petition by the city of Milwaukee, ordered the joint use of these tracks in order to relieve alleged traffic congestion on Grand Avenue, the principal business thoroughfare of Milwaukee which parallels Wells Street. The commission's order provided for a basis of compensation for the joint use of the track in question, but permitted any interested party to request a rehearing on the question of compensation. Such a rehearing was requested by the owner companies and the subject is being further investigated by the commission and hearings in the matter held.

News Notes

Wages Cut in Salt Lake.—An agreement has been reached by which the trainmen in the employ of the Utah Light & Traction Company, Salt Lake City, Utah, will accept a cut from 50 cents an hour to 47 cents for first-year men and a cut from 57 cents to 54 cents an hour for those longer in service. Under terms of the agreement, the wage schedule is to be further reduced on Nov. 1 provided it is shown there has been no increased cost of living as indicated by the Bureau of Labor statistics.

Benefit Association Out of Debt.—Membership in the Employees Mutual Benefit Association of the Twin City Rapid Transit Line, Twin Cities, Minn., is now 2,638, as announced in the report as of April 27, 1922. Claims for the period from February, 1921, to February, 1922, totaled $1,862. President Horace Lowry of the company said that although during the first year of the association it was necessary to borrow $10,000 from the company, subsequent adjustment of dues has put the association out of debt.

Will Probably Retain Present Scale.—It is believed that negotiations now being carried on between the management and employees of the Buffalo & Lake Erie Traction Company, Erie, Pa., will probably result in a continuation of the present wage scale of 42, 46 and 50 cents, the agreement for which terminated on April 30. It is understood that employees have made no new demands for the coming year nor has the company suggested any cut in the wages. The company has, however, offered to pay operators of the new "one-man" cars 5 cents more an hour than is being given operators of the old type cars.

Wage Agreement Renewed in Akron.—Four railway unions on the property of the Northern Ohio Traction & Light Company, Akron, Ohio, have voted to accept the company's offer of the same rate of wages paid in 1921. The new contract became effective May 1. The rates provide that city platform men in Akron, Canton and Massillon are to continue receiving 43, 45 and 48 cents an hour, based upon the length of service. The company's interurban platform men will continue to receive 48, 50 and 53 cents an hour for the next twelve months. A year ago the men, after refusing to take a 15-cent hourly wage cut, tied up the company's lines with a strike. After being out a week the men finally agreed to submit the question to arbitration. The arbiters reduced wages 17 cents an hour, 2 cents below the company's offer. This year there was no controversy whatever over the matter of the wage scale.

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Financial and Corporate

Lifting of Receivership Likely

Security Holders of New Orleans Company Will Move to Reorganize Under Agreement with City

Unless some event now unforeseen intervenes a bill to foreclose the New Orleans Railway & Light Company's properties and sell them will be filed with the court before June 1. This will be the first real step toward the reorganization of the company and the discharge of the receivers under the plan of settlement with the city to which reference is made elsewhere in this issue. Under the terms of that agreement six months is allowed the company in which to perfect the reorganization arrangements.

The proceedings in foreclosure will be brought in behalf of the holders of the 4½ per cent bonds of the company. In this proceeding the New York Trust Company, trustee under the indenture securing the bonds, will act as the principal. The mechanics of this procedure will include the presentation of the findings of the special master, the drawing up of his report, the confirmation of that report by the court and finally the promulgation of the order of sale. Thirty days will then intervene in which the sale of the property will be advertised, after which the bondholders will bid it in. After confirmation of the sale the new company will step in and the receivers will be discharged.

As now proposed under the terms of the agreement of the company with the city the following disposition will be made of the existing outstanding securities of the company:

(a) Outstanding underlying bonds to remain undisturbed.

(b) Present outstanding 4½ per cent general mortgage bonds, due July 1, 1935 (for subordination of their lien so as to provide for future betterments and improvements and for necessary refunding operations through a new first and refunding open mortgage bond issue), shall be exchanged for 25 per cent in cash and the remaining 75 per cent in new general lien 4½ per cent bonds, due July 1, 1935, in the form of a closed mortgage. The said new 4½ per cent mortgage shall rank immediately after, and be subordinated to the said new first and refunding open mortgage.

(c) The present outstanding refunding and general lien 5 per cent bonds, due Nov. 1, 1949, with defaulted interest thereon, to be refunded by $5,129,000 income bonds, due Nov. 1, 1949, bearing 6 per cent per annum interest (adjusted for defaulted interest subsequent to June 1, 1922).

(d) The present outstanding defaulted 7 per cent gold notes and defaulted interest thereon, to be refunded by $3,955,000 preferred 7 per cent cumulative (adjusted for defaulted interest subsequent to June 1, 1922).

(e) The balance (after the issuance of securities to provide for receiver's certificates and the expenses of the receivership) up to the amount of the allowable rate base, at the date of reorganization, shall be common stock issued to represent the equity in the property, now represented by stock.

(f) Said reorganization into said new company to be accomplished at the earliest possible date and within six months from the date of the passage thereof by the council, subject to legal delays, beyond control; provided, however, that if said reorganization shall not be accomplished within nine months from said date, then the commission council reserves the right to abrogate this arrangement.

Additional important features of the plan provide for virtual local control of the company and for future financing through the sale of common stock. Before any disbursements may be made out of earnings or surplus to securities junior to the 4½ per cent bonds, a fund of $200,000 must be created, half of which must be invested in improvements and the other half used to retire 4½ per cent bonds. Before any payments are made on the preferred stock an additional fund of $100,000 is to be set up to be employed after the manner of the $200,000 fund. The dividends on the common stock must not exceed 8 per cent, but can be made as much as 9 per cent in case that rate is necessary to secure the sale of such stock at par. In no event, however, are the dividends on this stock to exceed 9 per cent. Under the plan for the reorganization of the American Cities Company, which formerly controlled the local New Orleans Company, the latter will be excluded from participation in the reorganization of the American Cities Company.

The New Orleans *Item* has worked out the estimated increase in the value of the company's securities as a result of the reorganization. This is shown in the accompanying table.

The settlement agreement fixes the value of the properties at $44,700,000 as of Dec. 31, 1920, made up of $25,000,000 for the railway lines, $11,048,000 for the electric properties and $8,652,000 for the gas properties.

THEORETICAL INCREASE IN VALUE OF SECURITIES OF NEW ORLEANS RAILWAY & LIGHT COMPANY UNDER REORGANIZATION

Pre-organization Value			Reorganization Value	
Amount of Issue	Security	Market Value	New Selling Price	New Market Value
$11,521,000	Underlying bonds, sold at average price of	$9,792,850	About 95	$10,944,950
17,500,000	Gen. Mtg. 4½ per cent bonds at 50	8,750,000	About 70	12,250,000
6,117,000	Series "A" 5 per cent junior bonds, at 35	2,140,950	About 65	3,976,050
3,955,000	7 per cent gold notes at about 20	791,000	About 60	2,373,000
	Total value bonded debt	$21,474,800	Total new value bonded debt	$29,544,000
Stock			Stock	
$10,000,000	Preferred stock at about 10	1,000,000	New selling price, .50, for $6,000,000 of all common and preferred stock in new company	3,000,000
20,000,000	Common stock at no value			
	Total value stock	$1,000,000		
	Total value of bonds and stock	$22,474,800		32,544,000 22,474,800
	Value added to total securities by reorganization			$10,069,200

Reorganization Plan Being Perfected

If the plans agreed upon by the bondholders of the South Carolina Light, Power & Railways Company, Spartanburg, S. C., which has been in the hands of a receiver for over a year, are worked out the local company there will be succeeded by a new company to be known as the South Carolina Gas & Electric Company, and the date when the new company will begin functioning will probably be July 1 of this year.

Counsel for the bondholders of the South Carolina Light, Power & Railways Company appeared before Judge H. H. Watkins, of the Federal Court in Anderson recently, and in a conference submitted the details of the proposed reorganization to him. While the Federal court has no jurisdiction at this stage of the proceedings, the courtesy of a full hearing was accorded counsel for the bondholders.

Under the foreclosure proceedings the new company will take title to the assets of the present company; it will issue 6 per cent bonds to take care of the outstanding 5 per cent bonds, and general mortgage bonds to supplant the present secured notes. Secured creditors are to be given first mortgage bonds and the unsecured creditors will be taken care of by notes. The power users under contract will be protected by the new company assuming the contracts of the old company.

$16,019,398 Fixed as Value of Power Properties

The light and power property of the Virginia Railway & Power Company, Richmond, Va., is valued at $16,019,398, according to an order entered on April 13 by the State Corporation Commission. Again the commission declined the reproduction theory as a basis for the valuation.

The new valuation was made by the commission following a rehearing from a decision returned in March, 1921, with which the company showed dissatisfaction. As a net result, the sum of $1,400,000 is added to the figures arrived at in the former case, which was of property as of June 30, 1920. The additions represent new property added since that date and certain waterpower rights which the company had failed to include in its claims in the former case. No rates for electric service are involved in the valuation.

Electric railway properties are not included in the valuation figures. The Richmond-Petersburg interurban line, which was valued separately last year by the commission, also is not included.

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Surplus in San Francisco

William Von Phul, president of the Market Street Railway, San Francisco, Cal., has submitted the report of the company's operations for the period from April 1 to Dec. 31, 1921, the former being the date when the company assumed operation of the property heretofore conducted by the United Railroads. Mr. Von Phul stated that during the period the properties were well maintained and that the present physical condition was good.

Total operating revenues for the nine months amounted to $7,089,944 and total expenses were $5,768,794. The statement shows net earnings of $1,321,151, a gross income of $1,439,465 and a net profit for the period amounting to $487,521. The balance sheet as of Dec. 31 shows total assets of $48,696,411, of which $604,130 is represented by cash and $156,593 by investments in securities. The total number of passengers carried was 188,503,830, of which 141,869,551 were revenue passengers, 46,169,808 free transfer passengers and 464,471 free passes.

Quebec Property Reports a Surplus

The Quebec (Que.) Railway, Light, Heat & Power Company has reported gross earnings from operation for the eighteen months ended Dec. 31, 1921, of $4,139,320. Of this amount $2,757,836 was for the period of twelve months ended Dec. 31. Expenses for eighteen months were $3,104,840 of which $2,074,029 was for a twelve-months' period.

Net earnings totaled $1,034,480, of which $683,807 was for the twelve months ended Dec. 31. The net surplus for the eighteen months' period was $101,708 and for the twelve months the net surplus was $87,513. The corresponding period of twelve months ending Dec. 31, 1920 showed a deficit of $33,172 so that an improvement for 1921 over 1920 is noted in the sum of $120,684. The balance at the credit of surplus account on June 30, 1920, was $582,705. After adding the surplus for the eighteen months' period ending Dec. 31, 1921, there remained on the latter date a surplus of $684,413.

Elevated Lines to Consolidate

Directors of the subsidiaries of the Chicago (Ill.) Elevated Railways have approved the proposed consolidation plan and if it is sanctioned by the Illinois Commerce Commission, a special meeting of the stockholders will be called for July 11 to ratify same.

More than $2,000,000 will be expended for new equipment and other improvements necessary to operation of longer trains. The Oak Park Elevated. which has been in receiver's hands since 1911, is to be sold and become part of the new system.

The valuation placed on the properties by a former utilities commission in 1919 was $86 250,000. The value now is $86,682,900, not including $711,204 for property not used in railroading. The new board of directors will consist of Samuel Insull, Britton I. Budd, John H. Gulick, R. Floyd Clinch, Chicago, and S. A. Russell, New York.

Transportation Industry Growing

Has Doubled in Size During Last Ten Years—Ten Essentials for Future Growth Laid Down

With a total investment of approximately $50,000,000,000, the transportation industry of the United States ranks second to agriculture and ahead of manufactures, J. Rowland Bibbins, manager of the department of transportation and communication of the Chamber of Commerce of the United States, declared before the National Construction Conference held in Chicago.

"This enormous figure," he said, "covers only the actual operating plant for rail, ocean, highway, electric railway and waterway transport, and does not include factories producing the equipment and materials of construction.

"The industry has nearly doubled in size in the last ten years, largely due to the tremendous expansion of motor transport and shipping. Rough estimates for the future indicate that during the next twenty years, more capital probably will be required for new developments than our present national debt, which is about $25,000,000,000, thus bringing the total transport investment up to at least $75,000,000,000. This amounts to $580 per capita, of $1,450 for every worker gainfully employed in this country.

Ten essentials of transportation were given by Mr. Bibbins as shown in the following:

1. Transportation involves fundamentally three elements—time, cost and security of transit.
2. It is a problem of movement from producer to ultimate consumer, involving in every case collection, trans-shipment and delivery, which are some times more important than the main haul.
3. Cost analysis is more needed than ever before, particularly the cost of rail-to-job and vice versa.
4. Utilization of local materials and the most efficient form of local handling and movement, need most careful study.
5. Important progress is being made under great handicaps in new transport methods and adaptations, with a broader perspective and more co-operative effort.
6. Transportation is a utility essential to our national economic life and prosperity. If regulated, it must be conserved.
7. Stability of investment, operations, and costs are essential to adequacy of service and stability in business generally. If restricted in earning power continuous development can only come through sustained credit.
8. National efficiency demands a minimum transport investment in various agencies that will permit the most economic location of industries, with reference to raw materials, labor and markets.
9. The rate structure is a most potent form of control over the settlement and industrial life of the nation. It is essentially a national problem.
10. The national chamber can function best in conserving and aiding in developing a national transport system with its several agencies. The construction industry can function helpfully by close attention to its over-all cost distribution and to various new methods and adaptations.

Smaller Net Earnings for Northern Ohio Traction

The Northern Ohio Traction & Light Company, Akron, Ohio, in 1921 carried 47,799,437 passengers on its Akron, Canton and Massillon city railway lines, and 16,820,442 passengers on its interurban lines extending from Cleveland to Urichsville. These facts are contained in the company's annual report submitted to stockholders and announced on April 28.

In 1920 the company carried 68,903,885 passengers on its city systems and 20,876,115 passengers on its interurban cars.

The company's power and light service shows an increase in consumers from 38,438 in 1920 to 40,103 last year, although the total sales in kilowatt hours were lower, being only 102,681,834 last year as compared to 148,081 253 in 1920.

Comparative figures on the Northern Ohio Traction earnings for the last three years on its railway department show $5,376,818 in 1921; $7,280,396 in 1920, and $6,133,442 in 1919, and in its electric department of $3,214,476 in 1921; $3,629,234 in 1920, and $3,094,397 in 1919.

Operating expenses and taxes in 1921 were $6,485,951 as compared to $8,530,648 in 1920 and $6,678,125 in 1919.

Net balances to profit after deduction of interest charges and dividend payments on preferred stock were $442,777 last year and $1,024,269 in 1920.

During the year the company spent $2,045,662 for additions and improvements to its property, including the purchase of 111 new city and interurban cars.

The company's annual balance sheet shows properties, plant and equipment appraised at $37,805,862. Current assets are $2,160,534. Investments in capital stock of affiliated corporations are listed at $225,149 and amounts due from subscribers for capital stock are given at $1,061,839.

Unadjusted debits of the company are $1 082,615. Current liabilities are given at $3,240,193. The company reports a surplus on Dec. 31, 1921, of $700,664. The surplus on Dec. 31, 1920 was $863,013.

Receivers for Steinway Railway

S. W. Huff and Robert C. Lee, who were appointed receivers of the Steinway Railway, Long Island City, N. Y., on April 29, are expecting to take over the property as receivers on May 7. The Steinway Railway is an underlying company of the New York & Queens County Railway, which is not otherwise involved in this action. An early announcement of the receivership published in this paper last week was in error and no receivers have been appointed to take charge of the New York & Queens County Railway. The application for receivers for the Steinway Railway was made by the trustee representing the holders of the first mortgage bonds of that company.

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Operating Deficit $1,796,418

Serious Loss in Revenue Caused to Company at Albany by Recent Strike

The operating revenues of the United Traction Company, Albany, N. Y., from all sources, during 1921, amounted to $1,199,783, operating expenses to $2,779,670 and taxes to $216,531. The operating deficit for the year was $1,796,418, which compares with $113,049 in 1920. The decrease in operating revenues was $2,054,190, or 63.13 per cent; operating expenses decreased $369,536, or 11.73 per cent, and taxes decreased $1,285, or about three-fifths of 1 per cent. The increase in the operating deficit was $1,683,369. These facts are all contained in the annual report of the Delaware & Hudson Company for the year ended Dec. 31, 1921.

The strike of the employees of the United Traction Company which began on Jan. 29, 1921, resulted in serious loss of revenues, the company explains, and in extraordinary additions to the expense of operating per unit. Additional revenue losses resulted from the illegal operation of "jitneys." The strike was formally abandoned on Nov. 24, 1921, although it was practically at an end long before that date, and the subsequent resumption of the use of these lines by the general public has been rapid, so that traffic is now nearly at the normal level. It is pointed out that continuous efforts by the legal department of this company have greatly reduced the competition of illegally operated motor vehicles. No difficulty has been experienced in obtaining a sufficient number of qualified men to operate the cars at the rates of wages fixed when the former Public Service Commission for the Second District declined to authorize the rates of fare necessary to support the rates of wages then in force and took its position in favor of liquidation of wages.

The port says the services supplied by the United Traction Company can be most satisfactorily rendered by one-man cars. The first car of this type was put in service during June, 1921; about ninety such cars are now in use in Albany and Troy and by July 1, 1922, it is expected that this type of equipment will be in operation for all regular, basic schedules, possibly excepting the lines between Albany and Troy and between Albany and Cohoes.

Since Jan. 28, 1921, under the order of the former Public Service Commission, the company has received 8 cents as its standard fare (four tickets being sold for 30 cents) in Albany and only 6 cents in Troy, Watervliet, Cohoes, Green Island, Waterford and Colonie and five in Rensselaer. This discrimination was considered by the former state authority to be required by the then-existing law. A statutory change having been made, by which the new commission is empowered to authorize reasonable rates in such cases, application for an equalization of rates was presented to the commission early in November, 1921. Testimony was taken and the case submitted upon briefs, and it is now awaiting decision. The report expresses the opinion that with properly equalized fares, one-man cars and the improved operation now possible, the income account of the property should become substantially more favorable.

Returns of Other Delaware & Hudson Lines

The operating revenues of the Hudson Valley Railway amounted to $970,779, operating expenses to $921,320, taxes to $64,066 and the net operating deficit to $14,607. The data show a decrease in operating revenues of 11.67 per cent and in operating expenses of 6.65 per cent, with an increase in taxes of 16.43 per cent and a decrease in net operating income of 125.60 per cent. Operating revenues were considerably reduced by the strike on the United Traction Company, as the employees refused to operate cars south of Waterford and into Troy from Jan. 29 to Aug. 17, 1921. By reductions made in October and November, 1921, and in January, 1922, the wages paid by this company were equalized with those paid by the United Traction Company.

On Aug. 9, 1921, the Public Service Commission allowed an increased fare on the interurban lines, representing an increase of 1 cent in each zone on the Glens Falls and Waterford divisions, with the exception of the line between Mechanicville and Waterford. The urban fares in Glens Falls, Hudson Falls, Fort Edward and Saratoga remain the same as formerly, that is, 7 cents. Full benefit from the new rates has not been obtained on account of labor troubles in and near Glens Falls and Fort Edward, the employees of the International Paper Company and other companies having been on strike since early last spring.

The operating revenues of the Plattsburgh Traction Company amounted to $39,320, an increase of 18.71 per cent; operating expenses to $40,171, an increase of 35.60 per cent, and the net operating deficit to $2,797, a decrease of 263.19 per cent in net operating income. In order to reduce operating expenses several of the cars will be altered from the two-man type to the one-man type, installing proper safety devices.

The operating revenues of the Troy & New England Railway amounted to $4,967, a decrease of 87.41 per cent; operating expenses to $15,153, a decrease of 65.87 per cent, and there was an operating deficit of $11,942, which compares with the deficit of $6,825 in the previous year. Service was suspended on Jan. 29, 1921, at the same time that the employees of the United Traction Company went on strike, as those of this company were members of the same union as those of the United Traction Company. A temporary trestle was constructed to replace a bridge that had been destroyed and the line was opened for traffic on May 28, 1921.

Weekly Pass Is Holding Earnings Up in Fort Wayne

Results of the first eight weeks operation with the weekly pass on the Fort Wayne city lines of the Indiana Service Corporation are shown in a general way in the accompanying tabulation of comparative earnings by weeks for 1921 and 1922. For the first two months of 1922, before the weekly pass was started, the gross revenue fell behind that for the corresponding weeks of the previous year rather consistently, and for the two months there was a total decrease of $2,595. During the next eight weeks, with the pass in effect, the earnings were rather consistently above those for the corresponding weeks of the previous year. For these first eight weeks of the pass the total earnings showed an increase of $2,482 over the total earnings for the corresponding eight weeks of 1921. The differential in earnings between the first eight weeks without the pass and the next eight weeks with the pass is therefore $5,078. This, of course, may not be a true measure of the increase in revenue attributable to the pass, as part of the increase may be due to other traffic conditions unaffected by the pass. The number of passes sold is also shown in the table, from which it will be seen that the number sold increased steadily during the first five weeks, but since then has remained about constant.

FORT WAYNE CITY LINE EARNINGS BY WEEKS

1921					1922				Increase
Jan. 3	Jan. 9	$18,677.72		Jan. 2	Jan. 8	$18,302.66	*$375.06*
10	16	20,037.49		9	15	18,887.67	*1,149.82*
17	23	20,030.64		16	22	19,640.82	*389.82*
24	30	20,054.51		23	29	20,764.32	709.81
31	Feb. 6	20,024.76		30	Feb. 5	19,085.27	*939.49*
Feb. 7	13	19,727.83		Feb. 6	12	18,841.15	*886.68*
14	20	18,953.50		13	19	19,240.87	287.37
21	27	19,205.20		20	26	19,353.18	147.98
28	March 6	18,935.75		27	March 5	18,902.49	*33.26*
March 7	13	19,171.85		March 6	12	18,326.01	*845.84*
14	20	17,741.40		13	19	17,875.46	134.06
21	27	18,299.59		20	26	18,634.96	335.37
28	April 3	17,709.50		27	April 2	18,651.00	941.50
April 4	10	17,005.64		April 3	9	17,269.53	263.89
11	17	17,646.82		10	16	18,769.20	1,122.38
18	24	16,894.40		17	23	17,459.24	564.84
		$300,116.60				$300,003.83	*$112.77*

Note *Italics* denote decrease.

PASSES SOLD

Feb. 27	March 5	2,967	March 27	April 2	3,872
March 6	12	3,544	April 3	9	3,740
13	19	3,517	10	16	3,589
20	26	3,722	17	23	3,671

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Readjustment Plan Outlined

Interborough and Manhattan Elevated Work Out Plan Subject to the Approval by Security Holders

Judge Julius M. Mayer at New York announced on May 3 the revised plan of readjustment of the terms of the Manhattan Elevated Railway lease, carrying with it complete refinancing of the Interborough Rapid Transit Company and many other measures which were regarded by members of the Transit Commission as in themselves offering assurance, if adopted by the security holders, of improved conditions for years to come.

A summary of the plan authorized by Judge Mayer says it averts a receivership and avoids the imposition of a double fare, which a separation of the elevated from the subway lines would have entailed. "By keeping the system together without a receivership," it is stated, "the continuation of the 5-cent fare over the entire Interborough Rapid Transit system is assured."

OUTLINE OF TENTATIVE FINANCIAL PLAN

This plan, which has been agreed to by committees representing the Interborough bondholders, the Inter.-Met. 4½ per cent bondholders and the Manhattan stockholders, contains the following provisions:

1. Provision of $15,000,000 to meet the demands of the Transit Commission and other capital requirements of the company by an issue of ten-year 6 per cent gold notes, to be taken by a syndicate or by the holders of the Inter.-Met. bonds, who will become the stock owners of the Interborough stock.
2. Replacing the old 7 per cent guaranteed rental of the Manhattan by a new rental to be paid out of earnings. The highest guaranteed rental under the new plan is 5 per cent.
3. Reorganization of the directorship of the Interborough to include representatives of the Manhattan Company, the Transit Commission and the City of New York, "if they elect to avail themselves of the privilege."
4. Limitation of earnings on Interborough stock to 7 per cent, a provision which is expected to remove the stock from the speculative class of securities. Earnings in excess of 7 per cent, it is understood, will be put into improvements on the property.
5. Elimination of the Interborough Consolidated Corporation as the holding company controlling the Interborough Rapid Transit Company. In place of the Interborough Consolidated $45,740,500 preferred stock, 932,626 shares of common stock and $63,808,000 collateral trust bonds, there will remain only the $35,000,000 stock of the Interborough itself.

The agreement was declared by the negotiators to have been effected in the expectation of co-operating with the Transit Commission in its plans for making unification of the lines effective.

COMMISSION WILL ANNOUNCE PLAN FOR NEW CONSTRUCTION

The Transit Commission will announce shortly the provisions of its $250,000,000 construction plan for new subways, which will be made effective at the earliest date. Construction work on the Queensboro extension to Times Square will begin at once.

Judge Mayer and the security holders' committees transmitted the readjustment plan to George McAneny, chairman of the Transit Commission, with a letter explaining that the plan was intended to conform to the general plan of the commission for reorganization of the city's transit facilities. The commission will take no action on the matter until it is made the subject of formal application for approval by the stockholders. The plan must first receive the approval of the 35,000 owners of stocks and bonds of the two companies.

Report of Sale of Tide Water Power Company Confirmed

The banking house of A. E. Fitkin & Company, New York, confirms the rumor of the purchase of the controlling interest in the Tide Water Power Company, Wilmington, N. C., formerly owned by Hugh MacRae, banker, Wilmington. Mr. Fitkin and his associates state that they acquired considerable in excess of 51 per cent of the common stock of the Tide Water Power Company, and that they had extended an offer to the remaining holders of the outstanding stock to purchase their holdings at $125 per share and had set as the final date for acceptance, June 23, 1922.

The Tide Water Power Company for the year ended Dec. 31, 1921, reported gross revenue of $1,043,775 and net income of $333,247. The company has paid regular dividends on its preferred stocks for fourteen years and on its common stock for ten years at the rate of 7 per cent per annum.

This property, in addition to other holdings in which A. E. Fitkin & Company are interested, will be operated under the management of the General Engineering & Management Corporation. The report of the purchase was referred to in the ELECTRIC RAILWAY JOURNAL for April 29.

Financial News Notes

May Appoint Receiver.—It is very likely that within a short time a receiver will be appointed to supervise the handling of the property of the St. Albans & Swanton Traction Company, St. Albans, Vt. Operation was discontinued on Nov. 11, 1921.

Release from Receivership Probable by Sept. 1.—The City Council of Pittsburgh, Pa., has been informed by Special Counsel Robinson that the Philadelphia Company plans to take over the Pittsburgh Railways and to secure a release of the receivership on or prior to Sept. 1.

Abandonment Approved.—The Public Utility Commissioners of New Jersey have approved the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., to abandon property at Second and Lalor Streets, Trenton. The building on the corner will be razed.

Will Hear Suspension Application.—The Ohio Public Utilities Commission will hold a hearing on May 23 on the application of the Steubenville, East Liverpool & Beaver Valley Traction Company's petition for abandonment on certain lines. Company officials will show at that time the losses sustained on the River road and Pleasant Heights car lines on which the company wants to suspend operation.

Hearing Scheduled.—Hearing on the valuation of the property of the St. Paul City Railway, Minneapolis, Minn., will take place on June 1. Postponement was made on April 25, the day previously set for the hearing before the Railroad and Warehouse Commission. The hearing is to bring about a basis for a decision as to a reasonable rate of fare for a proper return on the investment.

Frank Coates a Cities Service Director.—Frank R. Coates, John M. McMillin and W. A. Jones have been elected to the board of directors of the Cities Service Company, succeeding Benjamin N. Freeman, Sir E. Mackay Edgar and Horton H. Scott, who resigned at the expiration of their terms at the stockholders' annual meeting. Mr. Coates is president and general manager of the Community Traction Company, Toledo.

Wants to Issue Certificates.—A. O. Chapin, receiver for the Cleveland & Erie Railway, Girard, Pa., has applied to the District Court at Erie asking for permission to issue receiver's certificates, not to exceed $11,000 for the purpose of purchasing power from the Northwestern Electric Company. In the petition the receiver alleges that the present power plant of the traction company, located at Elk Park, Erie, is dilapidated and not capable of furnishing the necessary power.

Bonds To Be Redeemed.—The Detroit United Railway through its treasurer, A. A. Gingrass, has called for redemption its five-year 7 per cent collateral trust gold notes on June 1, 1922, at the office of the Central Union Trust Company, New York. The bonds will be redeemed at 100½ per cent of the face value of principal and accrued interest, $2,000,000 face value of notes of this issue. The bonds were issued under collateral trust indenture dated April 1, 1918, between the Detroit United Railway and the Central Trust Company as trustee.

Councilman Wants City to Take Over Line.—A move to have the city of Columbus, Ohio, purchase and operate the Columbus, Urbana & Western Electric railway, which at present operates between Columbus and the storage dam, has been launched by Councilman H. L. Justus, who says he will introduce an ordinance to that effect. Councilman Justus would have the city extend the line to the site of the proposed O'Shaughnessy dam some distance up the river. The councilman points out that the line could be operated with current supplied by the municipal light plant. The line at present is 7½ miles long.

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Traffic and Transportation

New Commutation Rates

Milwaukee Company Has Set Out Determined to Increase Popularity of Its Interurban Lines

In an effort to increase the popularity of its interurban railway service and to attract additional traffic thereto, the Milwaukee Electric Railway & Light Company placed in effect on April 10 a new commutation rate and modified the conditions under which commutation rates formerly in effect could be purchased, so that its patrons can now purchase transportation over its interurban lines under as liberal terms as possible.

Many Kinds of Commutation Tickets Available

All forms of commutation tickets are now available between any two points on any one of the four interurban lines of the company. In addition to commutation tickets previously sold, a ten-ride commutation ticket good for the use of the individual purchaser, during a period of six months from date of sale, is being sold at the rate of 2.1 cents per mile. There is also being sold for $20 a 1,000-mile book. This book will be honored for transportation on the lines of a number of electric railways in Wisconsin and will in effect be an interchangeable mileage book so far as electric railways in Wisconsin are concerned.

Prior to April 10 the company was selling a twenty-five-ride commutation book, a fifty-two-ride commutation book, a forty-four-ride students' commutation book and a 500-mile mileage book. All these carried transfer privileges to city cars on the inbound trip into Milwaukee, Racine and Kenosha. The new ten, twenty-five and fifty-two-ride books placed on sale on April 10 will permit the user to reach the interurban lines of the company in Milwaukee, Racine and Kenosha on the outbound trip also without paying an additional city fare. This will be accomplished by having city coupons attached to the interurban coupons in the books in question. The city coupons will be detached from the book in the presence of the city conductor, who will issue a transfer to the interurban lines.

Provides for Redeeming Unused Coupons

Another new feature of the commutation rates will be provision regarding redemption of unused coupons. Thus in the case of the twenty-five ride commutation ticket, which is sold at the rate of 2.25 cents per mile and is good for any number of people for a period of six months, five or fewer unused coupons will be redeemed at the purchase price originally paid per coupon. Unused coupons in excess of five will be redeemed on the basis of purchaser not paying in excess of the usual ticket fare for the number of coupons actually used. Similarly the fifty-two-ride commutation book, which sells at 1½ cents per mile and is good for the use of the individual purchaser during the calendar month in which purchased, twelve or fewer unused coupons will be redeemed at the original purchase price per coupon. This will also be true of the forty-four-ride students' commutation, which also sells at 1½ cents per mile and is good during the calendar month purchased for the use of the original purchasers who must be between ten and twenty-one years of age. School children under ten years of age can purchase a similar book at the rate of 1 cent per mile. In the case of the students' books, eight or less unused coupons will be redeemed at the original purchase price per coupon.

The 500-mile mileage book is sold at the rate of 2¼ cents per mile. The 1,000-mile mileage book will be sold at 2 cents per mile.

In connection with the introduction of the new rates, there were posted in all ticket offices of the company placards calling attention to the changes in the rates and conditions of sale. The new rates were advertised in the newspapers in the territory served by the interurban lines of the company. There was also distributed to passengers on the cars a leaflet giving information regarding the changes effected.

Through Rates on Utah Interurban

Arrangements have been made whereby through rates between points on the Bamberger Electric Railroad, Salt Lake City, Utah, in Davis and Weber Counties and points on the Union Pacific and its connections, Cheyenne and east, will be established and the necessary tariffs will be published at an early date.

The rate is made in compliance with a request made by the Public Utilities Commission on March 1, in which it was pointed out that 3,000 carloads of fruits and potatoes would be produced in the territory named this year.

The agricultural territory along the lines of the Bamberger Electric Railroad, particularly that section which is under the Bonneville Irrigation project, has developed very rapidly, and the granting of these through rates means still greater development on account of increased transportation facilities to the eastern markets via the Bamberger Electric in connection with the Union Pacific.

The Bamberger Electric already has through rates in connection with the Denver & Rio Grande Western Railroad.

Fare Order Suspended

Temporary Restraint Is Permitted in Chicago Against the Six-Cent Fare Ruling of State Commission

Temporary suspension of the 6-cent fare order of the Illinois Commerce Commission was directed by Judges Evans, Page and Geiger in the United States District court in Chicago on April 28. The judges announced that they had not had time to consider the evidence and arguments, and without passing on the contention of the Chicago Surface Lines that this rate would be confiscatory, they granted a temporary restraining order and allowed the attorneys until May 8 to file briefs.

Discussion of wages paid to employees of the surface lines formed an interesting part of the hearing. The Commerce Commission had stated that a 6-cent rate could be made effective without disturbing wages, but lawyers for the companies insisted that the commissioners had no authority to enforce other economies which they estimated would save about $14,000,000. These proposed economies included reduction of allowances for rate of return, maintenance, renewals and damages and a cancellation of payments to the city for street cleaning and sprinkling.

James M. Sheean, attorney for the companies, stated that the commission had no authority to direct a lower wage scale, but he said if the companies should undertake this now the commission would then order a rate of fare lower than 6 cents. The platform men in Chicago are receiving a maximum wage of 80 cents an hour, the highest in the country for surface lines, but they have insisted that the high rents in Chicago have made a lower scale impossible and they threaten to strike if their pay is cut.

The city's lawyer had suggested to the judges several times that if they find the 6-cent rate to be too low they would have authority to grant an injunction with conditions which would prevent the companies from charging as high a rate as 8 cents. The companies' attorney also thought that this might be possible.

The commission based its 6-cent order partly on an estimate that 50,000,000 extra passengers a year would be attracted by the lower rate. Counsel for the company showed that the commissioners had overlooked the fact that it would cost about $3,000,000 additional to haul these passengers.

Electric After Steam Road Business

It is now possible to ride between Tiffin and Toledo, Ohio, by way of the Tiffin, Fostoria & Eastern and Toledo, Fostoria & Findlay Railways, and save 60 cents on the round trip over and above the steam railroad fare. The time for the distance, about 52 miles, is two hours and twenty minutes. The steam road's time for the trip is less than two hours.

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Service Order Issued

I. R. T. Required Greatly to Increase Service—350 Additional Cars to Be Bought

The New York Transit Commission at a session held late on the afternoon of May 2 adopted two separate orders, one providing for an immediate increase in both train and car facilities by the Interborough Rapid Transit Company, to be effective on May 31, and a materially greater increase to be effective Sept. 18; the other, directing the placing of orders for 350 new steel cars.

Under the May schedule 246 additional trains will be operated during each twenty-four hours, while through the lengthening of many trains, there will be an increase of the number of cars in service of 2,014 per day.

Engineers Estimate May Schedule

The September schedule will add a further increase of 114 trains a day, making a total increase of 360 over the present operation, and increasing the total trains operated from 2,773 to 3,133. All this was explained to the newspapers by Chairman McAneny of the commission.

The estimates of the engineers of the commission show that under the May schedule alone there will be an increase of approximately 8,000,000 car miles—or 400,000,000 car seat miles—per annum. The immediate increase per day in car miles will be 20,935, and in car seat miles 1,046,750.

To operate the May schedule will require the employment of the full force of reserve crews now in the service of the company, numbering 300 men. The September schedule will require a further increase of 300, who are to be employed and trained for service during the summer months.

The equipment order directs the company to proceed with the order for the first 100 of the total of 350 cars immediately, and their delivery as soon as it is possible for the manufacturers to turn them out. On Aug. 1 the company is directed to place a further order for fifty cars to be delivered as soon thereafter as possible, and the final order for 200 must be placed within six months after the contracts for the construction work remaining to be done on the Jerome Avenue and the 180th Street yards and the 148th Street yard and shops have been finally approved and are ready to be delivered.

Rush Hour Service to Be Cared For

Under the sequence the orders are to take, the company will be required practically to exhaust its present man force on May 31, and in September to further extend toward a maximum the use of its present equipment. When the new cars have been provided, a third stage will be reached when still greater improvement, including material extension of the rush hour service, will be brought about.

The September schedules are based upon the operation of trains on a three-minute interval during the midday non-rush hours, against the present average of something over four minutes, while a considerable measure of relief is also given the rush hours. With the company's present equipment and the present working force, including the reserves who are to be drafted on May 31, it will not be possible, the commission says, to operate three-minute non-rush-hour trains. The intermediate schedule provides, therefore, for 3½-minute intervals in the middle of the day, though with material additions in the other hours before and after the morning and evening rush.

Yard Facilities a Problem

The work upon the yards, the completion of which will from now on afford the key for the final and in some respects the most important extensions of service to be made, is to be pressed by the commission as rapidly as the incidental contracts are approved by the Board of Estimate and Apportionment. Pending the completion of the building of these new yards, however, the company, under the supervision of the commission's engineers, is to provide temporary yard facilities and inspection sheds for that part of the increased service, possibly the full 150 cars included in the first orders, that can be taken care of without awaiting completion of the permanent yards.

General O'Ryan, a member of the commission, in a concurring opinion explained as follows:

> In the course of the proceeding it became apparent that the deficiencies in service were so great that the extent to which trains should be added would, from a practical point of view, become a financial problem rather than an operating problem. It is settled law that a regulatory commission, in the exercise of its regulatory powers over public service corporations, may not lawfully impose requirements, the cost of which would amount to confiscation of the company's property. After careful consideration of all the evidence offered in this proceeding, it became apparent that with the reduction in operating costs that has taken place during recent months, and with similar increase in revenues, there exists a very substantial sum which the company may annually be required to expend for increased service, without violating the limitation of law referred to.

The Interborough will abide by the order of the commission. A statement from the company says:

> Frank Hedley, president of the Interborough Rapid Transit Company, stated that the directors of the company had authorized the acceptance of the orders of the commission for additional service and for the purchase of additional cars, and that immediate steps would be taken to place the order for the first 100 cars required by the Transit Commission. He stated further that in transmitting the formal acceptance of the order he had written to the Transit Commission that while the company, without waiting for any further action by any official body, will place forthwith the initial order for 100 cars, it is his opinion that to make the cars effective for the service of the public next winter it will be necessary, as he testified upon the hearing, that provision be made for the temporary yard tracks at the Jerome Avenue yard and at the 180th Street yard and for the temporary yard and shop facilities at the 148th Street shops in accordance with drawing heretofore transmitted to the commission, and that until such provision shall be made the company will have no place to receive the cars.

Low Fare Bill Defeated

Three-Cent Fare Measure for Seattle Disapproved by Voters—Railway Must Be Self-Supporting

Councilman Erickson's 3-cent fare bill for the Seattle (Wash.) Municipal Railway was defeated at a general election on May 2 by a three to one majority. A trifle over 15,000 voted for the measure and more than 40,000 against it. Only 1,699 more persons voted for the measure than signed the original initiative petition which placed the measure on the ballots. The bill was voted down in all but ten of the 294 precincts and in the ten only bare majorities were returned for it.

Other Amendments Rejected

The department of public utilities which operates the municipal railway lines was not abolished as provided in Erickson's proposed charter amendment No. 3. Voters also rejected the amendment which would have created a separate department of the municipal street railway and created a department of transportation the superintendent of which would have been a member of the Board of Public Works appointed by the Mayor for three years.

Crushing defeat of the Erickson measure comes as a climax to a long fight which has been waged to prevent the invasion of the general tax fund of the city to defray the cost of maintaining and operating the municipal lines. The fight has been waged not only in opposition to the tax measure but also in the courts to establish finally the principle that the street railway as well as all other publicly-owned utilities must be self-supporting and in no way dependent on taxation for any part of its existence.

Five-Cent Fare Bill in Prospect

Immediately following the rejection of the Erickson scheme Councilman C. B. Fitzgerald stated he would at the first meeting of the new City Council after June 5, introduce a 5-cent fare bill. Mayor-elect E. J. Brown and two newly-elected councilmen during the campaign pledged themselves to a 5-cent fare. Other councilmen who hold over in their political offices favor a reduction in the present fares, which are 10 cents cash or tokens for 8⅓ cents.

Pass Plan in Effect in Terre Haute

The weekly pass plan went into effect on May 1 on the 5-cent city cars of Terre Haute by the Terre Haute, Indianapolis & Eastern Traction Company. The company recently applied to the Indiana Public Service Commission for permission to install the unlimited-ride transferable weekly pass to be sold for $1. The plan of the company was referred to in the issue of the ELECTRIC RAILWAY JOURNAL for April 15, page 660.

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Increase in Fares Authorized

The New York Transit Commission, under compulsion of a court decision issued an order on May 2 allowing the New York, Westchester & Boston Railway operating from White Plains to and through the Bronx to the Harlem River at 133d Street, New York, to increase its fares between stations in the City of New York from 5 cents to 7 cents. It is not a New York City railroad and is not in the class of railway corporations which can be brought into the plan of readjustment being prepared by the Transit Commission. Under the law the commission may allow increases to companies which do not come under the plan of readjustment.

This case was handed to the Transit Commission by the Public Service Commission for the First District, before which it was begun in 1919 when that commission started an inquiry into the tariff filed by the company for an increase in fare from 5 to 7 cents. The commission subsequently denied the petition on the ground that it had not been delegated the power to authorize increases in such rates. The railway then appealed to the Supreme Court and obtained a writ of certiorari to review the commission's decision. On July 2, 1920, the Appellate Division sustained the writ and referred the matter back to the commission. The case by permission was appealed to the Court of Appeals, which on Feb. 21, 1921, affirmed the order of the Appellate Division. Following the decision of the Court of Appeals a hearing was held on April 5 and on April 25 the Transit Commission succeeded the Public Service Commission and took up the case.

It was brought out in these hearings that the 5-cent fare was unreasonable and the Appellate Division stated in its opinion that it was evident that the contemplated public service could not be rendered at the rate of fare prescribed in the city ordinance, namely 5 cents. The Transit Commission found that in 1920 and during a part of 1921 the existing 5-cent rate was inadequate and that according to the company's estimates under the proposed 7-cent rate, there would be only a small balance after the payment of operating expenses and taxes and not sufficient to pay all interest charges. It was also shown that the proposed rate is substantially lower than the rate charged for corresponding distances on the Harlem Division of the New York Central Railroad.

Claims Roads Can't Be Built on Increased Fares

W. V. Hill, manager of the California Electric Railway Association, recently made public an opinion that high fares, which the California Railroad Commission had authorized in most cities, alone would not prove enough to encourage making extensions or building new electric railway lines. He said that the reason there was practically no new building had nothing to do with fares, but with the life of franchises. It was impossible in this day to finance electric railway enterprises in California, because of the limit of time of franchises. He declared that modifications of these conditions would have to be made before there would be any activity in electric railway construction.

Uniform Fare Case Reopened

At Albany on April 28 Chairman Prendergast of the Public Service Commission issued an order reopening the case of the United Traction Company in its application for readjustment of fares in Troy, Watervliet, Cohoes and Rensselaer to make them uniform with those in Albany. Much speculation is rife as to the reason for the order, but as yet the chairman has neither set a date for the hearing nor has he served the company with a bill of particulars.

The question of one-man cars is only one of a wide range of possibilities on which the commission may be seeking additional evidence.

John E. MacLean, counsel for the company, is quoted as saying:

> The proceedings by the commission in demanding additional evidence is not unusual. It happens quite often . . . . At the hearing last February one-man cars were brought into the case and evidence was introduced to show that the operation of the new cars so far in the experience of the company, had not reduced expenses enough to prevent the company from getting its proposed uniform fares in cities in which its lines are operated.

Transportation News Notes

P. A. Y. E. Installed.—The Public Service Railway of Newark, N. J., has placed pay-as-you-enter cars on all the lines running out of Market Street, Camden, N. J.

Railway Gives Up Mail Contract.—The Bridgeton & Millville Traction Company, Bridgeton, N. J., has notified the post office department that it will terminate its contract to carry mails from Bridgeton south to Bivalve after May 8.

Express Service Maintained.—The Southwest Missouri Railroad, Webb City, Mo., started on March 15 the handling of local express shipments from all towns on the line between Carthage, Mo., and Picher, Okla.

One-Man Cars on Toledo Belt Line.—The Community Traction Company, Toledo, Ohio, will experiment with cars operated by one man on the Bancroft belt line. Cars now in use on the line will be equipped with new entrances, turnstiles and other safety devices.

Ex-Service Men Want Reduced Fare.—The City Council of Seattle, Wash., recently received a petition from forty ex-service men, disabled veterans, patients at the Cushman Hospital at Tacoma, for the privilege of riding on cars of the Seattle Municipal Railway on the school fare of 2½ cents.

Round-Trip Rates Reduced.—Reduced round-trip rates effective on all Sundays during the summer months were placed in effect between Springfield and Columbus, Ohio, and way points April 23 by the Indiana, Columbus & Eastern Traction Company. The new round-trip rate is $1.75 between Columbus and Springfield. The regular fare between the two points is $1.25 one way.

Saving Effected.—New ticket forms for commutation tickets from Minneapolis to Hopkins and Lake Minnetonka over the suburban lines of the Twin City Rapid Transit Company save the riders who have to take a local trolley trip to reach the suburban cars 6 cents. Heretofore, there has been no coupon to cover this extra ride. The new forms provide local coupons either going or returning.

Seeks New Regulation.—A suggestion has been made to the Trenton (N. J.) City Commission calling for the stopping of trolley cars from the near to the far side of the street. It is pointed out that if this regulation was adopted then vehicles following trolley cars could make the turns of corners without waiting for the trolleys to move. The commission arrived at no decision concerning the plan.

Fare Reduced.—The fare of the Inter-City Terminal Railway line from Main and Markham Streets to Levy has been reduced from 13 to 10 cents, according to P. C. Warren, manager of the company of North Little Rock Ark. Heretofore the passenger has been paying 5 cents on the bridge bus, 3 cents for a transfer, and then an additional 5 cents for points outside the city limits. The fare to Rose City remains the same.

Favors Island Terminal Project.—The Navy Department of the United States favors turning over portions of Yerba Buena Island in San Francisco (Cal.) Bay for terminal facilities. The document which makes known the department's attitude says that the island must be available for all transportation companies without distinction. Hearings on the proposition are to be held in San Francisco under the direction of Admiral Halstead.

Reduced Rates for Anglers.—The Portland Railway, Light & Power Company, Portland, Ore., has recently announced a new reduced round-trip rate that will be effective on Sundays on the interurban lines of the company for the coming trout season, and for the regular summer excursion and outing season. The rates will go into effect at once, to take care of the crowds that always try their luck at angling the first week end of the trout season. They will continue until Nov. 15. The new rate provides for a fare of 75 cents for the round trip to Bull Run, good Sundays only, and to Estacada, Sundays only, $1 for the round trip. The round-trip fare to Gresham will be in effect every day, at 50 cents for adults, and 25 cents for children between the ages of five and twelve years.

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Personal Mention

Mr. Colton Edits "Aera"

Hartford "Times" Editor Selected by Association Was Formerly With Connecticut Company

John W. Colton has been selected for the post of editor of *Aera*. He will enter upon his duties at once. Here was a case of the job seeking the man. There is no reason to suspect that John W. Colton was not happy and contented as associate editor of the *Times* up in Hartford. He was engaged there in work which has been a hobby with him since he entered journalism in Boston, and while the post he filled at Hartford was one of great responsibility, still the appeal was irresistible for him to throw himself into the larger work which the position with the association offered. Nor will this work be altogether new to him. As the executive assistant to President Storrs of the Connecticut Company during 1919 Mr. Colton acquired a knowledge of the railway business which gave him just the experience essential to the editorship of *Aera*. The engineer, the accountant or any other specialist in electric railway affairs could hardly qualify for the post. This is no reflection on the ability of any of these specialists, no more so than it would be to say that your out-and-out journalist, unless he was especially adaptable as was Harlow C. Clark, could fill the *Aera* editorship acceptably.

J. W. COLTON

It is a peculiar combination of talents that is required for the *Aera* editorship and John W. Colton has it. He became a student of electric railway problems a number of years back in Masachusetts.

One of Mr. Colton's first assignments in newspaper work was to cover the electric railways, and as assistant city editor of the Boston *Journal* in 1904 and 1905 and as news editor of the Springfield *Union* from 1906 to 1918 he paid particular attention to the problems of the electric railways. In 1918 Mr. Colton was called to the Bridgeport district office of the ordnance department to take charge of the publicity of the Bridgeport district, which at that time had very important plans under way for the dilution of labor in munition factories and increasing production by various other means. From this post Mr. Colton went to the Connecticut Company as executive assistant to President Storrs. There his jurisdiction covered information and advertising, among other things. His big work with the Connecticut Company, however, was in educational publicity among the employees of the company. The employees were sold on their own company, but Mr. Colton succeeded in getting home to the men the idea of selling their own company to the general public. From the Connecticut Company Mr. Colton went to the post on the Hartford *Times* which he will now relinquish.

Like most other newspaper men Mr. Colton is a very good listener. Also like most other newspaper men his suggestions are constructive and pertinent. It is these qualifications that fit him admirably to sit in at the meetings of the various committees of the association at which the editor of *Aera* is both a student and a counselor.

KEEPS AT IT

It was the privilege of the ELECTRIC RAILWAY JOURNAL to publish in the issue for Jan. 3, 1920, an article "A Forward Look in Public Relations" from the pen of John W. Colton. In that review Mr. Colton unconsciously fixed a place for himself in the industry that made it almost essential that some time or other he should be called back into the fold, although at the time the thought that he would ever again enter electric railway work was to him probably the remotest thing in the world. As the last of six pertinent points emphasized by Mr. Colton in that article he recommended keeping everlastingly at it. There is the motto of John W. Colton: "Keep Everlastingly at It."

F. F. Lilly Heads Company Paper

F. F. Lilly, publicity director of the Union Gas & Electric Company, Cincinnati, Ohio, has succeeded A. W. Thayer as editor of *Green Line Topics*, a pamphlet issued weekly by the South Covington & Cincinnati Railway, Covington, Ky., in the interest of its patrons. Mr. Thayer has joined the staff of a national advertising concern at Chicago. For the time being, Mr. Lilly will edit *Green Line Topics* and direct the publicity campaign of the Union Gas & Electric Company.

Director Formerly Sold Papers

J. W. Walsh Started as Newsboy on Bamberger Electric Railroad With $5 Capital

The most interesting thing about people, perhaps, is that you never know what they are going to do. This differs somewhat in meaning from the statement that they do the unexpected. At least, the two remarks differ when applied to John W. Walsh. The difference would be apparent if you had been privileged to observe him when he was selling newspapers and magazines on the Bamberger Electric Railroad, Salt Lake City, Utah, and if you are privileged to know him now that he is the recently elected director of that same road.

The point is that every one expected him to do the unexpected, but none knew what the unexpected would be. The sublety, after all, probably lies in the personality of Mr. Walsh and not in any truism about the genus homo. The subtlety, after all, probably lies in haps tell from the set of the tie, the slope of the shoulders, the slant of the forehead, just what manner of man he may be. But anyone, even without studying any directions about reading character at sight, could tell from the quiet, keen eyes that he had battled against odds and was not satisfied until he had won.

J. W. WALSH

Some of the odds—in fact, most of them—were due to the fact that for a start he had only $5. Today $5 would be very little of an open sesame to any kind of success. It was not much more help fourteen years ago, as any good financier will testify. The deduction follows, of course, that success came, not from money, but from ability and application. Mr. Walsh, with five dollars, confidence and enthusiasm, presented himself to Governor Bamberger toward the completion of the Bamberger Railroad, and asked for the privilege of selling papers on the trains. Impressed not so much by the five dollars as by the two rarer assets, Governor Bamberger gave him

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the right, and in addition allowed him to plan for a stand at the Salt depot. Later he opened a stand at Ogden, then north in the state as far as Preston when the Ogden Rapid Transit Company was opened. He expanded this work to the Orem lines later, and to the Los Angeles & Salt Lake Route.

Mr. Walker, in the fourteen years since he first walked into the president's office, has formed the Walsh News Company and the Beehive Advertising Company. He is president of both companies.

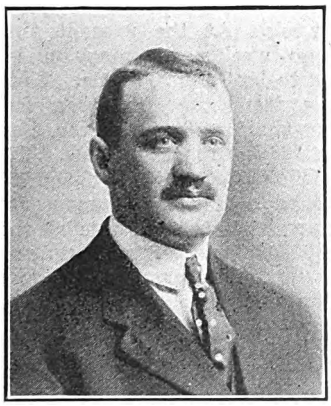
Governor Bamberger recently said that Mr. Walsh has the qualities of ability and trustworthiness. It was these qualities which won him when the embryo railroad director asked for the privilege of selling papers.

Philadelphia Appointments of Interest

G. P. Good Is Transportation Chief—E. G. Allen Joins Mitten's Company as Chief Engineer—R. T. Senter and F. W. Johnson to Assist President —Mr. Johnson Will Edit "Service Talks"

With the appointment, previously announced, of George P. Good as superintendent of transportation and Elbert G. Allen as chief engineer of the Philadelphia Rapid Transit Company, that company places in its important executive positions two prominent leaders.

Mr. Good looks back upon a long career of steady service with the Philadelphia company. Twenty-eight years ago he started as motorman—in latter day terminology—of one of the Market Street cable cars. At that time his title was gripman, but he became a true motorman when the company installed the electric trolley system. He soon became instructor of new motormen, but passed on to greater duties as starter at Front and Market Streets. His knowledge of electric trolleys soon made him a valuable inspector, and later floating inspector, street dispatcher, street superintendent, assistant divisional superintendent at the Forty-first Street and Haverford Avenue carhouse, and floating division superintendent.



G. P. GOOD

Thus he came to 1910. His advance continued to be rapid, for he became district superintendent of the western district, and of the northern district later. Last year he stepped into the position of assistant superintendent of transportation. His recent appointment is the logical sequence of his splendid work and the knowledge he has gained of problems peculiar to this company.

Mr. Allen's work as chief engineer will be to co-ordinate all the engineering activities of the company. He brings to his work the experience of twenty years with Stone & Webster properties. From 1903 to 1907 he was electrical and mechanical engineer of the Seattle (Wash.) Electric Company. There he had supervision of design, construction and operation of power supply substations, transmission and distribution, including the design and construction of a 50,000-volt substation and a 13,000-volt distribution system to substations. While with the Seattle company he was connected also with the Columbia Improvement Company in the design and construction of electrical features of the hydro-electric plant at Nooksack Falls and a 50,000-volt transmission line to Bellingham, Wash., which extended for 40 miles. He lectured on street railway engineering at the University of Washington.

From 1907 to 1921 Mr. Allen was supervisor for companies of the Stone & Webster Engineering Corporation at Dallas, Tex.; Helena, Mont., and the White River hydro-electric plant at Seattle. He did special investigating for the Boston office of Stone & Webster for many projects, and assisted in the designing of the Hog Island shipyard.

In September, 1921, Mr. Allen joined the Mitten Management, Inc., of Philadelphia, spending the following months on power matters for the International Railways, Buffalo, N. Y. His recent appointment as chief engineer of the Philadelphia Rapid Transit company became effective April 1.

Other appointments, which are effective April 15, are those of R. T. Senter, as assistant to the president on special assignment, and of F. W. Johnson as assistant to the president. Mr. Johnson will continue as editor of *Service Talks*.

H. J. Woodard has been promoted to the position of assistant auditor of the Georgia Railway & Power Company. The appointment is effective at once. Mr. Woodard has been connected with the company since 1910 and was promoted from the position of head bookkeeper. He will have charge of the general books and monthly statement work. Mr. Woodard suceeds F. A. Brine, who was made auditor on April 1 in the place of H. Flynn, now assistant comptroller.

E. R. Shepard Begins Private Practice

E. R. Shepard, who has been active in connection with the electrolysis work of the United States Bureau of Standards, has resigned from the Bureau to follow the same line of endeavor under his own name. Mr. Shepard was graduated from the electrical engineering department of the University of California in 1904 and in 1906 received the degree of M. A. from Harvard University after two years of post-graduate work in physics and engineering.

He then was employed by Stone & Webster and was associated with the Columbus (Ga.) property of that firm for nearly two years. From 1909 to 1914 he was assistant professor of electrical engineering at the Oregon Agricultural College. He has been with the Bureau of Standards since 1914. Mr. Shepard's publications, his numerous electrolysis surveys and field studies, and his activity in connection with the publications and research work of the American Committee on Electrolysis, of which he is a member, are well known. He is the author of reports on "Modern Practice in the Construction of Rail Bonds and Joints for Electric Railways" and "Leakage Resistance of Electric Railway Roadbeds and Its Relation to Electrolysis." Besides these, he has prepared numerous short articles on three-wire distribution for electric railways, electrolysis of lead under continuous and periodic currents, and reports of electrolysis surveys in various cities.

E. G. ALLEN

Most of the electrolysis surveys which have been conducted by the Bureau of Standards during recent years, as well as the field studies jointly conducted by the Bureau and the American Committee on Electrolysis, have been under the personal direction of Mr. Shepard. His experience in handling the electrolysis problem in a co-operative manner, the viewpoint which he has acquired through contact with all of the affected interests, and his intimate knowledge of all phases of the problem should contribute to qualify him in an unusual manner as an independent engineer in that field.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

American Equipment for Chinese Tramways

According to Commercial Attaché Arnold of the United States Department of Commerce in Peking, China, the contract for electrical equipment for the Harbin tramways, including the power plant, has been awarded to the Hua Sheng Trading Company, representing an American firm. The amount involved is $2,270,000 gold. The above-mentioned company is composed of Chinese and American interests and the equipment for this contract will come largely from the United States.

Additional Electrification of Swiss Federal Railways

The Swiss budget of 1922 provides 57,000,000 francs for electrification of the Federal railways, according to a report to the United States Department of Commerce from Berne. It is hoped that the electrification of the Bellinzona-Lugano-Chiasso, the Erstfeld-Lucerne and the Goldau-Zug lines will shortly be completed. The Amsteg power station, of 80,000 hp., will be ready to furnish energy about April, 1922, and the Lucerne-Zug-Zurich line will probably be electrified by the end of the year. Together with the St. Gothard, the Sion-Lausanne line is to be electrified and will be opened in the summer of 1923. The current will be supplied by the 60,000-hp. Barberine station, which by that time will have been completed.

Favorable Report from British Company

The Metropolitan-Vickers Electrical Company, which is one of the recent big British amalgamations (it includes the British Westinghouse Company among other concerns), has reported quite a favorable year despite trade depression. A. Aunan Bryse, presiding at the annual meeting on April 5, said that the profit was £440,342, or nearly £40,000 in excess of that for 1920. Orders received were considerably lower than in the preceding year, but they were able to keep the shops fully employed owing to the number of orders remaining unexecuted at the beginning of the period. One large order, running into about £1,000,000, for the supply of electric railway equipment for the South African government, it had been fortunate enough to secure during the current year in face of severe competition both from the Continent of Europe and America. In regard to prospects, the troubles were industrial disputes and the chaos of foreign exchanges. In the company's works, however, there was a continuance of harmony between the management and the workers. The output of the works had been the largest during the history of the company.

Genoa-Modane Operation Begun

Late press reports forwarded by the Commercial Attaché of the United States Department of Commerce in Rome, Italy, state that on March 20 last the first electric train was run on the Genoa-Modane route, the transportation being most successful. This line, which is 272 km. in length, is the longest single electrification in Europe. The journey from Genoa to Turin will be shortened by an hour as the result of this improvement. It is hoped within the next six months to complete the electrification of the line from Pisa to Genoa, which will greatly add to the comfort of that trip, now made disagreeable by reason of the numerous tunnels.

New Electric Railway in Poland

Commerce Reports for April 24 states that the construction of a new electric railway between Lodz and Tomaszow in Poland is to be started soon. Information can be obtained from F. W. Artport, Warsaw.

Seven Weeks Supply of Coal on Hand

In an analysis of the coal situation issued this week the coal bureau of the Natural Resources Production Department of the Chamber of Commerce of the United States calls attention to the general lack of demand for coal supplies. At the present rate of production and consumption there is no danger of any general shortage, says the bureau, for at least six weeks.

On April 1 the stock of coal in the hands of railroads, industrial consumers, public utilities and retailers was approximately 63,000,000 net tons. Adding to this 4,250,000 tons estimated at the Upper Lake docks and the unbilled coal on hand April 1 there was a total of 68,650,000 net tons above ground April 1. Stocks cannot drop below 20,000,000 tons without danger of a coal panic. The quantity of coal which apparently can be drawn from stocks before a serious situation develops is 48,650,000 tons. To this supply there will be continuously added the output from the non-union fields, which up to date has averaged about 3,500,000 tons per week. At the present time the average weekly consumption is estimated to be 8,100,000 tons. Therefore, supply from the non-union fields is falling short of meeting the consumption 4,600,000 tons per week. To cover this deficit, we have the 48,650,000 tons in storage. If the consumer continues to draw from this storage at the rate of 4,600,000 tons per week, unless there is an increase in production from the non-union fields, a shortage will be felt in approximately seven weeks.

ELECTRIC RAILWAY MATERIAL PRICES—MAY 2, 1922

Metals—New York

Copper, electrolytic, cents per lb.	13.00
Lead, cents per lb.	5.25
Nickel, cents per lb.	36.00
Zinc, cents per lb.	5.325
Tin, Straits, cents per lb.	31.25
Aluminum, 98 to 99 per cent, cents per lb.	19.10
Babbitt metal, warehouse, cents per lb.:	
Fair grade	30.80
Commercial	15.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$5.05
Somerset mine run, Boston	2.80
Pittsburgh mine run, Pittsburgh	....
Franklin, Ill., screenings, Chicago	3.00
Central, Ill., screenings, Chicago	2.00
Kansas Screenings, Kansas City	2.675

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$40.00
Standard open hearth rails, gross ton	$40.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.25
Tie plates (flat type), cents per lb.	1.75
Angle bars, cents per lb.	2.40
Rail bolts and nuts, Pittsburgh base, cents, lb.	7.00
Steel bars, cents per lb.	1.60
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	1.35

Hardware—Pittsburgh

Wire nails, cents per lb.	2.40
Sheet iron, (24 gage), cents per lb.	3.00
Sheet iron, galvanized, (24 gage), cents per lb	2.70
Galvanized barbed wire, cents per lb.	3.05
Galvanized wire, ordinary, cents per lb.	2.25

Waste—New York

Waste, wool, cents per lb.	13.00
Waste, cotton, (100 lb. bale), cents per lb.:	
White	10.00
Colored	9.00

Paints, Putty and Glass—New York

Linseed oil, (5 bbl. lots), cents per gal.	93.00
White lead, (100 lb. keg), cents per lb.	12.25
Turpentine, (bbl. lots), cents per gal.	92.00
Car window glass, (single strength), first three brackets, A quality, discount*	85.5%
Car window glass, (single strength), first three brackets, B quality, discount*	86.5%
Car window glass, (double strength, all sizes, A quality), discount*	85.0%
Putty, 5 lb. tins, cents per lb.	4.75

*These prices are f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	14.25
Rubber-covered wire, cents per lb.	5.90
Weatherproof wire base, cents per lb.	15.50

Paving Materials

Paving stone, granite, 4 x 8 x 4, f.o.b. Chicago, dressed, per sq.yd.	$3.20
Common, per sq.yd.	3.00
Wood block paving 3½, 16 treatment, N. Y., per sq.yd.	2.17
Paving brick, 3½ x 8½ x 4, N. Y. per 1,000 in carload lots	49.50
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.75
Cement, Chicago consumers net prices, without bags	1.97
Gravel, ¾-in., cu.yd., N. Y.	1.75
Sand, cu.yd., N. Y.	1.00

Old Metals—New York

Heavy copper, cents per lb.	10.00
Light copper, cents per lb.	8.625
Heavy brass, cents per lb.	5.375
Zinc, old scrap, cents per lb.	2.75
Yellow brass, cents per lb (heavy)	4.875
Lead, heavy, cents per lb.	4.56
Steel car axles, Chicago, net ton	$15.75
Old car wheels, Chicago, gross ton	19.75
Rails (short), Chicago, gross ton	16.00
Rails (relaying), Chicago, gross ton	15.75
Machine turnings, Chicago, gross ton	6.50

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Order for German Material Not Confirmed

The question of ordering tramway material from the Continent of Europe instead of from British manufacturers has again been acutely raised by the action of the Edinburgh Corporation Tramways Committee. As stated in these columns in the issue for April 22 the committee recommended acceptance of a tender from a German firm. Much local indignation was aroused by this action as it is recognized that in the present state of exchange with Germany it is absolutely hopeless for British manufacturers to quote as low as the Germans. When the recommendations came before the Town Council on April 6, the Council declined to confirm them. Instead, it awarded the contract for rails and fishplates to Dorman, Long & Company, Middlesbrough, and for steel poles to Stewarts & Lloyds, Glasgow.

Increased Demand for Electricity

The average daily production of electricity in kilowatt-hours by electric public utility plants in March was less than that for February by a little more than 1 per cent. The average monthly output for each of the past five months is as follows: November, 121,300,000; December, 123,200,000; January, 123,200,000; February, 123,800,000; and March, 122,500,000. These figures show that there has been but little change in the average daily production of electricity by public utility plants since November, 1921, and indicate, as was pointed out in last month's report, that the normal seasonal decrease in output during the late winter and early spring months is apparently being replaced by an increase in the demand for electricity.

Rolling Stock

San Francisco, Napa & Calistoga Railway, Napa, Cal., is in the market for one steel express car body.

Wisconsin Valley Electric Company, Wausau, Wis., expects to purchase one set of double trucks and four motors for work car and snow plow.

Los Angeles (Cal.) Railway has received fifty Westinghouse D.H 16 air compressors to replace older compressors now used on its rolling stock.

New Orleans Railway & Light Company, J. D. O'Keefe, receiver, New Orleans, La., will purchase 100 new street cars at an approximate cost of $1,000,000.

Ashtabula, Ohio.—The City of Ashtabula will take over the operation of the Ashtabula Rapid Transit Company, and plans among other betterments to purchase six safety cars.

City Railway, Dayton, Ohio, is burning piecemeal fifty single-truck cars. The company plans to refinish and remodel fifty-six double-truck street cars now in operation. The passenger capacity will be increased to at least fifty-two persons. The cars now seat not more than forty-eight.

Buffalo & Lake Erie Traction Company, Erie, Pa., has received twelve Birney safety cars which are the first of an order of twenty-five purchased from the J. G. Brill Company. They are to be placed in operation on the Twelfth Street Crosstown line.

Public Service Railway Company, Camden, N. J., has launched its power-saving campaign with the use of Arthur power-saving recorders. The equipment of the Riverside line practically completes the installation of recorders on all cars except those operated by one man.

Los Angeles (Cal.) Railway has ordered fifty more cars of its 1200 type, designed for operation in two-car trains. The cars will cost approximately $14,500 each. The bodies and trucks will be built by the St. Louis Car Company. Delivery of the first twenty-five is promised for the first of September.

Frankford Elevated Railway, Philadelphia, Pa., will receive sealed proposals for 50 steel passenger cars, complete with all equipment (Contract 660) at the director's office, Department of City Transit, 1211 Chestnut Street, Philadelphia, until 12 o'clock noon, Thursday, May 25, 1922, and opened immediately thereafter.

Interborough Rapid Transit Company of New York has been directed by the New York Transit Commission to purchase 350 cars. The first order of 100 is to be placed immediately with delivery as soon as possible. On Aug. 1 the company is directed to place a further order for fifty cars, and the final order for 200 cars must be placed within six months after the contract is let for the construction of work remaining to be done on various shops and yards.

United Electric Railways, Providence, R. I., has received and begun operation with twenty-five safety cars purchased from the Osgood-Bradley Car Company. The company is also considering the purchase of a number of double-truck one-man cars and expects to be in the market for four double-truck snow plows and a snow sweeper.

Market Street Railway, San Francisco, Cal., during the nine months from April 1, 1921 to Dec. 31 in addition to the general maintenance work on its cars, built the remainder of the twenty new cars of the 266 type and equipped them with new General Electric 247 motors. These cars are in operation on the main lines of the system.

Western Ohio Railway Company, Lima, Ohio, has purchased ten cars from the J. G. Brill Company at a cost of $11,500 each. These cars are 45 ft. long, and 8 ft. 6 in. wide. They will have three compartments—arranged for baggage, smoker and ladies' compartment. The seating capacity will be forty-eight. General Electric 35-hp. motors and air-brake equipment will be used.

Track and Roadway

United Electric Railways, Providence, R. I., will undertake extensive track renewals over the entire system during the coming summer.

Kingston, Portsmouth & Cataraqui Electric Railway, Kingston, Ont., expects to rebuild ½ mile of track in paved street with 90-lb. A. S. C. E.

Salina (Kan.) Street Railway expects to rebuild about ½ mile of track. This will be laid in concrete. New rails will be used for approximately 800 ft.

Market Street Railway, San Francisco, Cal., from April 1, 1921, to Dec. 31 inclusive reconstructed 25,000 ft. of single track with standard 9 in. rails.

Ashland Light, Power & Street Railway, Ashland, Wis., expects to relay tracks between Ninth Avenue West and Seventh Avenue East, a distance of sixteen blocks.

New York State Railways, Rochester, N. Y., has just ordered ten hand-throw lever switches for installation on its tracks, over which heavy interurban cars operate.

Knoxville Railway & Light Company, Knoxville, Tenn., expects to place during the next thirty days orders for material to rebuild about 3½ miles of single track and to pave the same.

Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., is rehabilitating its track between Dixon and Sterling, a distance of 14 miles. It is also reconstructing its tracks on city lines in Sterling.

Wisconsin Valley Electric Company, Wausau, Wis., expects to rebuild on account of paving about 1,000 ft. of track with material on hand. An order has been placed for one turnout with the Buda Company.

Knoxville Railway & Light Company, Knoxville, Tenn., expects to rebuild its lines on Sixth Avenue from Albert Place to Washington Avenue and beyond. The entire roadbed will be torn out and a new one installed.

Illinois Central Electric Railway, Canton, Ill., expects to build 1,400 ft. of track to be changed from the main streets in the City of St. David and to run parallel with the tracks and on the right of way of the Chicago, Burlington and Quincy railroad.

Los Angeles (Cal.) Railway has started the work of centering the tracks at the east end of the Stephenson Avenue line. The track will be reconstructed and pavement installed. Between Rampart and La Fayette Park on West Second Street, 116-lb. girder rail is being installed.

New York, N. Y.—The Board of Estimate has approved three contracts for subway construction involving an appropriation of $212,444. Two of these contracts are for work on the Fourteenth Street-Eastern District subway and the other for track installation in the Interborough yards at Livonia Avenue, Brooklyn.

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Interborough Rapid Transit Company, New York, N. Y., will require additional car yards and inspection facilities to comply with the recent order of the Transit Commission for increased service. It is planned to provide temporary yards and sheds to take care of the first order of cars.

St. Louis, Mo.—Several industrial organizations have presented a petition to the United Railways, St. Louis, Mo., asking the company to extend the Natural Bridge trolley line from its present terminal at King's Highway and Natural Bridge Avenue to Pine Lawn. The Chamber of Commerce and twenty-nine industrial companies are asking for the extension.

Southern Indiana Gas & Electric Company, Evansville, Ind., will start work on street improvements just as soon as weather conditions permit. Workmen have begun to repair tracks and brick paving in Main Street. Among the improvements to be started soon will be the laying of double tracks along Walnut Street from Lafayette to Canal Street.

Montreal, Que., Aldermen recently indorsed the executive committee's report recommending the building of a mountain tram line into Mount Royal Park by the Shakespeare Road. This line would connect with the eastern and western sections of Montreal. The committee also recommended that a demand be made on the Tramways Commission for the establishment of the line.

International Railway, Buffalo, N. Y., has been opposed in its plan to double track its line in Goundry Street, North Tonawanda by Mayor Carl F. Drews. President H. G. Tulley of the railway announced that the company wished to make this change, before the old Niagara Falls cars were routed through that street, following discontinuance of trackage in Sweeney Street and Payne Avenue.

San Francisco (Cal.) Municipal Railway construction on the Taraval Street and Masonic Avenue extensions is not to be interrupted, according to a recommendation of joint public utilities and finance committees of the Board of Supervisors. The Ocean View and Sunset extensions will be held up for the time being. Engineer O'Shaughnessy is preparing a new report on the cost of the Ocean View extension. Work on the Duboce Avenue route is being held up until the engineer can make a financial report.

Princeton, Ind.—Lawrence Lyons, director of Indiana state highways, and George J. Nattkamper of Terre Haute propose to construct a traction line from Princeton to the coal fields east and southeast of that city. The line would operate coal and miners' trains. One plan suggested is that the proposed electric line might connect with the Chicago & Eastern Illinois Railroad setting cars for haulage over the main line to Chicago. This would give the Chicago & Eastern Illinois connection with the Oakland City and Francisco fields. No definite action was taken by the Chamber of Commerce.

Orleans-Kenner Traction Company, New Orleans, La., may be extended from its present terminus near the St. Charles Parish line to Sarpy, 16 miles distant. This would give a mileage of 32 miles. The country traversed by this suburban route is largely devoted to truck farming, most of which produce is shipped to New Orleans for sale and consumption. A number of manufacturing plants have found desirable sites along the road, whose volume of business has grown to very respectable proportions, and is constantly on the increase, hence the movement to extend the road along the river front.

Power Houses, Shops and Buildings

Detroit United Railway, Detroit, Mich., is building an extension to its Highland Park repair shop.

Southern Indiana Gas & Electric Company, Evansville, Ind., expects to purchase one 7,500 kw. turbo-generator with boilers of 1,000 hp. capacity together with the necessary coal handling machinery.

New York, N. Y.—The Board of Estimate has voted $4,000,000 for immediate commencement of work on the Staten Island freight and passenger tunnel between South Brooklyn and St. George.

United Electric Railways, Providence, R. I., are remodeling their power house and installing new equipment. An order has been placed with the General Electric Company for one 15,000-kw. turbo-generator and a 2,000-kw. rotary converter, transformer and switchboard. A Westinghouse condenser has also been ordered, and equipment for burning pulverized coal, together with additional boilers, will be ordered later.

The Ohio Public Service Company, Mansfield, Ohio, is contemplating building a new power plant on the Ohio River to supply power to the whole system. The system will include the cities of Warren, Alliance, Massillon, Mansfield, Ashland, Elyria and Lorain, which are expected to be connected by a high-tension line to be built within a few years.

Indiana Service Corporation, Ft. Wayne, Ind., has begun condemnation proceedings for the purpose of securing the real estate necessary for the construction of a station for the accommodation of the employees of the General Electric Company who use city street cars. Notice of the company was called to the fact that several thousand employees of the General Electric Company use these cars daily, with no protection from bad weather. The location is such that cars can be loaded and unloaded on a switch without interfering with traffic on the Broadway line.

Trade Notes

J. E. Coonan, agent for railway supplies, has announced the removal of his office effective May 1 from 135 Broadway to 149 Broadway (Singer Building), New York City.

T. McGahan and **H. W. Renick** have taken over the Magnetic Signal Company of Los Angeles and will continue the manufacture of the Magnetic flagman and their new Simplex relay. Mr. McGahan is vice-president of the Joy Tarbell Lumber Company, Chicago, and Mr. Renick former manager of sales of the Elliott Frog & Switch Company of St. Louis.

Westinghouse Electric & Manufacturing Company, announces a reorganization of the Supply Sales Department and the establishment of a Merchandising Sales Department. J. J. Gibson is made assistant to the vice-president; A. A. Brown is appointed manager of syndicate operations; J. S. Tritle is appointed manager of the Merchandising Sales Department; T. J. Pace is manager of the Supply Sales Department; C. E. Allen is made manager of the St. Louis office, succeeding Mr. Tritle; George Bailey is supervisor of distributing agents; M. C. Morrow is made assistant to the manager of the Merchandising Sales Department, and J. J. Dorney will become assistant to the manager of the Merchandising Department.

New Advertising Literature

Irving Iron Works Company, New York, N. Y., in its No. 8 sheet Vol. 55 describes the Irving Subway, its fireproof ventilating flooring.

The Cutter Company, Philadelphia, Pa., has recently issued a booklet descriptive of its circuit breakers as applied to the protection of electrical machinery and assorted machinery in central stations.

The Griscom-Russell Company, New York, N. Y., has just published bulletin No. 904 describing their multiwhirl coolers, which are used for the cooling of oil and water in connection with Diesel engines.

Magnetic Signal Company, Los Angeles, Cal., has just published a catalog of Magnetic wig-wag crossing flagman and signal accessories. Complete information is given regarding the construction and operation of equipment of this kind.

Sprague Electric Works, New York, N. Y., has recently issued Bulletin No. 48,717 descriptive of its motor drive and central system for newspaper presses. The fifteen-page booklet contains some interesting illustrations of Sprague specialties for newspaper offices in the composing room, jobbing department and stereotyping department.

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The Uniqueness of Automatic Switching in Substations

WHEN asked recently why his company had adopted automatic control for its substations, an engineer said that starting and stopping a rotary converter by hand was becoming too expensive. The local records showed that in six years the cost of performing this simple function had increased more than 300 per cent. This was not deduced by means of a theoretical calculation; the figures were taken from the ledger. There was no possible gainsaying them. The answer was, of course, automatic control.

The increase in cost in this case was not due entirely to a higher wage rate. There were accompanying changes in working conditions which were also expensive. The net result, however, was as given. And there was no increase in output per employee to compensate for the increased cost; it was a sheer addition to operating expense. The fact is that the actual output of a substation operator is small anyway. If everything is going well he has practically nothing to do. Alertness and resourcefulness are really what he is paid for, and these qualities are seldom called into play.

Here the automatic control steps in, with the unique quality of always being on the alert and always, or nearly always, knowing exactly what to do. The attention of the best of human operators will sometimes lapse; that of the control relay (if in good working order), never. And automatic control does its work at a considerable money saving.

The references made above to good order of automatic equipment is not an aspersion on its qualities. They connote simply good maintenance. Automatic equipment cannot be installed and then forgotten; it needs intelligent and consistent care. Given this, it will make good.

The New York Situation Looks Better

ELECTRIC railway conditions in New York City are better, and this fact is being reflected in the higher quotations for all traction securities. The improved condition is also shown by the acceptance by Mr. Hedley for the Interborough Rapid Transit Company of the order to that company by the commission to purchase immediately 100 of the 350 more cars which the commission estimates are necessary to supplement the present service.

The latest figures published on the recent earnings of the Brooklyn Rapid Transit Company are for the nine months ended March 31. The net income for this period, after payment of interest, sinking fund, etc., was $2,012,041 against a deficit of $5,386,349 for the previous similar period. This showing has been reflected in the doubling of the quotation for the stock.

The better condition on the Interborough Rapid Transit system is due principally to the plan of readjustment of the finances of the three interested companies, dated May 1, 1922. These companies are the Interborough Rapid Transit Company, the Manhattan Railway Company and the Interborough-Metropolitan Company and its successor, the Interborough-Consolidated Company. From a financial standpoint, the situation is complicated by guarantees and leases extending for long periods, bonds issued with stock collateral, improvements made by a lessee to the property of the lessor, city contracts, city participation in profits, etc. A receivership for the immense Interborough Rapid Transit Company afforded always a possibility for a solution, but as explained in an editorial in the issue of this paper for April 8, this would have meant a loss for every one concerned, including the public. Fortunately it was possible to secure unity of action without this final recourse.

The agreement reached calls for sacrifices, but these seem to be proportioned in accordance with the equities in the properties at present, and wisely so, rather than on conditions as they were supposed to exist fifteen or twenty years ago. For a guaranteed stock the Manhattan stockholders secure what amounts practically to a cumulative lien on the net earnings of the present Interborough system, beginning at 3 per cent the first year and increasing to 4 per cent and then to 5 per cent, with possibilities of increased dividend rentals of 1 or 2 per cent more later, after the full dividend is reached, if the Interborough earnings permit it to pay more than 4 per cent or 5 per cent itself.

The stockholders of the Interborough Rapid Transit Company in turn agree that no dividend shall be paid them before July 1, 1926, nor until all cumulative dividend rentals at the rate provided be paid with all other charges upon the Manhattan property and to limit their own dividends in any year to 7 per cent up to July 1, 1950, with other adjustments and concessions for the benefit of the Manhattan stockholders. At the same time the holders of the Interborough secured convertible gold notes due on Sept. 1, 1922, agree to extend these notes for ten years, while the holders of the Interborough refunding 5s consent to a postponement of all sinking fund installment for five years beginning Jan. 1, 1921.

A provision for a wider participation in the management of the company is made by the clause which declares that while one-half of the directors of the company shall be elected by the stockholders, the other half may be elected or appointed by either the Transit Commission, or the city of New York, or the Manhattan company or the holders of the first and refunding 5s in proportions to be determined later by the reorganization committee.

Holders of the Interborough-Metropolitan Company collateral trust 4½ per cent bonds (secured by Inter-

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borough Company stock originally pledged at the rate of $500 in stock for each $1,000 bond) may participate in the plan by purchasing a certain proportion of the new ten-year notes or by surrendering another proportion of their bonds, and holders of the Interborough stock (of which about $1,000,000 is still in the hands of the public) are placed on a similar basis.

It is estimated that during the next four years the plan will supply total earnings available for arrears, improvements and betterments and other capital purposes of $19,491,500, besides paying the fixed charges and dividends on the Manhattan Company stock and $11,743,000 to the city, as its share of the surplus.

Street railways have this favorable situation. In growing cities, and practically all American communities are extending, there is constant need for additional transportation facilities. Oppressive measures can be adopted against a railway company for a time, but when the need for extensions becomes acute a more favorable treatment must be accorded if capital to build the new lines is to be secured. New York is in this position, and a program for seven subway projects to cost $218,000,000 was announced last week. This proposal should help to clear up the situation in regard to the existing roads.

Elimination of Tax-Exempt Securities Given Another Impetus

THE effect of the tax exempt security as a block to proper development of constructive industry, and particularly as one of the greatest impediments to the growth of public utilities in expanding to meet increasing demands for service, has been repeatedly commented upon in these columns. The peculiar condition arising from limitation of return on public utility investment, coupled with the freedom from taxation of public securities, has of course destroyed the greater part of the market for utility securities. Those who have suffered most have been the utility customers, the public, either through necessarily increased cost of service forced by increased cost of money or through a lack of expansion of utility service to meet the demands and needs of the public.

It is very gratifying, therefore, to note that the ways and means committee of the House has reported favorably the Green resolution for a constitutional amendment which would prohibit the issue of any more tax exempt government—municipal, state or federal—securities. Representative McFadden has also long pressed this idea in the House; Senator Smoot has done the same in the Senate; it will be recalled that President Harding made a recommendation to this effect in his message; and, as the report of the committee shows, Secretary Mellon and other officers also urge such action.

With this resolution thus favorably before Congress, there is more hope than ever that Congress will take the necessary action to place this question before the several state legislatures. That there will be sentimental arguments of states' rights and of hampering the development of good roads, of public building operations, and so on, may be expected. These, however, are not sound arguments as has been repeatedly shown. Constructive development is what makes for prosperity and makes possible public improvements. Those interested in such enterprises—and public utilities stand in the forefront—should not hesitate to do all possible to aid in the advancement and passage of this resolution.

Service at Cost Being Used at Memphis

SERVICE-AT-COST franchises are still in the making, and variations in them are limited only by the number of such franchises in existence. One of the latest to be put to the test of actual experience is that in Memphis, the results of which are recounted in this week's issue. Like most other franchises of its kind it has a barometer fund and a graduated scale of fares. Like a few others it has an incentive clause for economical operation. Unlike most if not all others it has a specified standard of service, namely, passenger car-miles per revenue passenger, set in the franchise at between 0.155 and 0.185. It is upon these variations probably that attention will principally be directed.

Taking the last-named point first there are undoubtedly certain advantages in having a definite standard where such a standard is reasonable. That this is so in Memphis seems to be indicated by the fact that the present standard, 0.1714 in January, 1922, is less than that in any year from 1906 to 1917, though it is higher than the average for 1918 or 1919. As expressed it has the objection that is independent of the size of the cars, but if there should be a material change in car size the standard would probably be modified. For this reason and because the average length of passenger ride is not the same in different cities, the Memphis figure is not necessarily desirable for any other city. In usual electric railway parlance this figure is expressed as its reciprocal, namely, in revenue passengers per car-mile. As thus expressed the standard for January would be 5.83.

The second most novel feature in the franchise is the incentive clause by which the return may vary between 6½ and 7½ per cent, depending upon the amount in the index fund. The basis for the extra return is of course the critical part of any incentive clause, and the difficulty in drafting any clause of this kind arises because there is no exact scale by which good management can be measured. Of course, the rate of fare, a basis often proposed, is not a proper measure of good management. While to the public it may seem at first sight reasonable that a company which charges a low fare should have a high rate of return and one which charges a high fare should have a low return rate, the rate of fare is determined by a great many factors besides the quality of management. In fact, a high fare is frequently caused by the high cost of materials and money, and to vary the rate of return inversely with the fare would often be to make the rate of return low when the company has to pay high for its money and materials and to make the rate of return high when money, transportation and materials are cheap.

If service-at-cost franchises are to increase, it is to be hoped that attention will continue to be given to the study of incentive clauses in spite of the fact that they are difficult to draw and from a financial viewpoint even the best is bound to have some element of weakness. That is to say, it is easily conceivable that in estimating the return on a property, a conservative lender of money might be more impressed with the way in which a hostile city administration could keep the return at the minimum figure in spite of good management rather than the possibilities which good management offers for securing the maximum return.

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Measuring the Service in Memphis

Under a Service-at-Cost Plan the Memphis Railway Provides Measured Transportation According to a Standard Agreed Upon with City—Expenditures of All Departments Are Continually Controlled by Budget

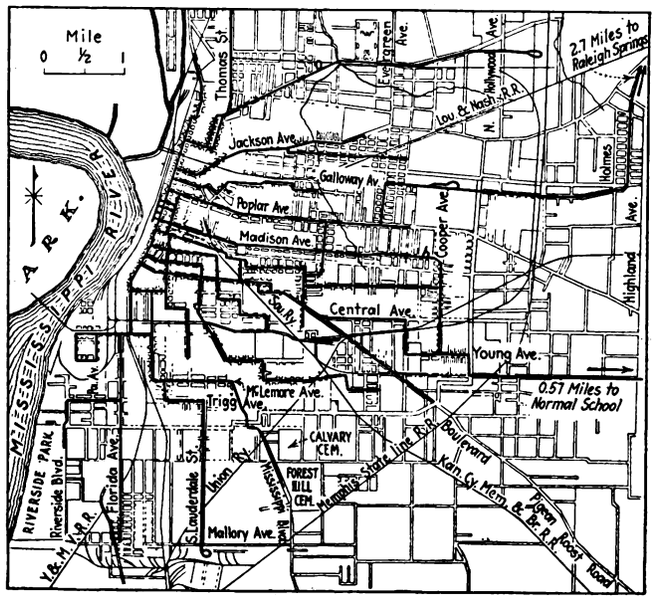
THE city of Memphis has had somewhat more than two years experience now with its street railway service-at-cost plan, in which transportation is furnished on a definite measure determined by a method developed by Ross W. Harris, consulting engineer, of Madison, Wis. In this measure, theoretically at least, each car rider, no matter where he may live, is getting his full money's worth. Daily checks are made to indicate that for the city as a whole and for each line the number of passenger car-miles furnished per revenue passenger is up to standard. Monthly checks are made to assure the railway management that all of its departmental expenditures are according to the budget planned far in advance.

The system is one which has so many novel and advantageous features from the standpoints of both city and company that it is worth while to analyze in detail the method employed.

STATE COMMISSION AUTHORIZED NEW FRANCHISE

It will be recalled that early in 1919, after extended hearings, the Tennessee Commission authorized the Memphis Street Railway to establish an emergency fare of 6 cents pending an appraisal of the value of its property. This appraisal was conducted by three experts, A. S. Richey of Worcester, representing the commission; J. H. Perkins of Birmingham, representing the company, and Ross W. Harris of Madison, Wis., representing the city. As a result of this appraisal the commission set the sum of $11,846,034 as that on which the company was entitled to fair return, and of this sum the cost of renewable property was $7,600,000. It was also found that from 1906 to 1917 inclusive the car-miles per revenue passenger had averaged 0.202, but later this ratio had fallen to 0.16, owing to the need on the part of the company to economize on service, difficulty in securing reliable employees and other conditions brought about by the war.

As a result of this investigation the commission on March 15, 1920, issued an order establishing as the sum on which a return should be allowed $11,846,034, plus such amounts as had been added and minus such amounts as had been deducted after July 1, 1919, in accordance with the accounting methods prescribed by the commission. It ordered the company to provide in the future a standard of service, which was that each month there should be "not less than 0.155 nor more than 0.185 passenger car-mile for each revenue passenger carried." It ordered the company to provide a renewal and replacement reserve which was to be 3 per cent annually of the investment in depreciable property until the reserve should reach the sum of $500,000, and thereafter whenever the reserve was more than $300,000 and less than $500,000, but it was to be increased to 4 per cent when the reserve was less than $300,000 and diminished to 2 per cent when the reserve was more than $500,000. The order also required the establishment of an injury and damage reserve and defined taxes as a part of the cost of service. It then established a fare-index fund and placed the permissible



MAP OF MEMPHIS SHOWING THE LINES OF THE MEMPHIS STREET RAILWAY

rate of return at not more than 7½ per cent nor less than 6½ per cent, the wording of the order in these respects and on the rate of fare being as follows:

RATE OF RETURN

Return on the investment shall be considered as a part of the cost of service and shall be allowed monthly at a rate per annum not more than 7½ per cent nor less than 6½ per cent. Such rate of return shall not be more than 6½ per cent during any month when the fare-index fund balance is less than $60,000. During each month when the fare-index fund balance is above $60,000, the return may be at any rate between 6½ per cent and 7½ per cent (inclusive) which the company may be able to pay out of the current revenues for such month, after paying operating expenses, charges to reserves and tax accruals, but without decreasing the fare-index fund balance below $60,000. Should earnings of the company during any month, plus the balance then in the fare-index fund, be insufficient to pay such minimum return as above described, then such deficit in return payments shall be paid from the earnings of succeeding months, plus accrued interest at the rate of 6½ per cent per annum, before any amounts are added to the fare-index fund.

FARE-INDEX FUND

The company shall establish a fare-index fund by crediting to such fund monthly all revenues after cost of service, as described herein, shall have been paid. Such fare-index fund shall be used to pay such deficits as may occur between revenues and the cost of service, and it shall also serve to determine the rate of return on the investments, as hereinbefore described, as well as to determine the rate of fare as follows:

Whenever on Jan. 1 or July 1, of any year, the balance in the fare-index fund shall be greater than $200,000 and shall have been increasing during the preceding two months, the rate of fare shall then be reduced to the next lower in the following list; whenever on Jan. 1 or July 1, of any year, the balance in such fund shall be less than $60,000 and shall have been decreasing during the preceding two months, the rate of fare shall be increased to the next higher in the following list. In the emergency that the fare-index fund continues to increase for two successive months after a decrease in the rate of fare, or continues to decrease for two successive months after an increase in the rate of fare,

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then the commission may announce an emergency change in the rate of fare, and put into effect the next indicated rate of fare forthwith, without waiting for the succeeding regular date of Jan. 1 or July 1.

RATES OF FARE

The rates of fare which automatically may be in effect in accordance with the operation of the fare-index fund, as above described, shall be as follows:

No. 1—8 cents cash
No. 2—8 cents cash with ten tickets for 75 cents
No. 3—7 cents cash
No. 4—7 cents cash with ten tickets for 65 cents
No. 5—6 cents cash
No. 6—6 cents cash with ten tickets for 55 cents
No. 7—5 cents cash

Whenever fare No. 2 or fare No. 6, as listed above, shall go into effect in the operation of this order, the commission will extend this list either upward or downward, as may be necessary, and will make further additions from time to time, so that the list may always contain at least two rates of fare above and two rates of fare below the rate in effect at any time.

Under any rate which includes tickets, such tickets may be sold in even multiples of ten. Under any rate, children of five years of age and under may ride free if accompanied by a passenger paying the regular rate. Transfers shall be given under any of the rates of fare in continuance of the present practice.

The commission then established as an initial rate No. 4 of the rates given herewith or 7 cents with ten tickets for 65 cents, and engaged Mr. Harris to make a traffic survey to determine the standards on which the future transportation service of the company would rest. In this engagement the city of Memphis and the receivers of the Memphis Street Railway joined.

A full list of the fares charged in Memphis is as follows:

	Adopted
Fare No. 7—5 cents cash	original fare
Fare No. 6—6 cents cash with ten tickets for 55 cents	June 16, 1919
Fare No. 4—7 cents cash with ten tickets for 65 cents	Aug. 18, 1920
Fare No. 3—7 cents cash (no tickets)	Aug. 19, 1921

The report by Mr. Harris, which was presented to the utility commission, city and company on Oct. 30, 1920, and later approved by all parties, was an exhaustive study of the situation, made recommendations as regards routing and reduction of traffic congestion and outlined a system of service standards upon which present operation is based. After the completion of the report Mr. Harris, who acted as consulting engineer for the city, was retained jointly by the city and company with the approval of the utility commission in connection with the execution and operation of the plan.

TABLE I—MEMPHIS STREET RAILWAY—NORMAL DISTRIBUTION FOR FIRST FIVE MONTHS, 1922, AND FOR YEAR

Estimated expenses for first five months of 1922 and for the year, based on a surplus of $50,000 (see line No. 13). This is the bogey toward which the company works.

Based on (1) 7 Cent Fare; (2) 25.5 Cents per Car-Mile for Operating Expenses (Item 6)

	Per Car-Mile Cents	January	February	March	April	May	Year
1. Maintenance of way and structures	2.34	$14,562	$13,465	$14,848	$14,466	$14,978	$178,351
2. Maintenance of equipment	2.87	17,798	16,457	18,148	17,681	18,307	217,985
3. Traffic	.07	412	381	420	410	424	5,051
4. Conducting transportation	15.90	99,047	91,581	100,993	98,397	101,878	1,213,099
5. General	4.32	26,808	24,787	27,335	26,632	27,575	328,337
6. Total	25.50	158,627	146,671	161,744	157,586	163,162	1,942,823
7. Renewals and replacement reserve	3.16	19,623	19,622	19,623	19,622	19,623	235,470
8. Taxes	4.02	25,000	25,000	25,000	25,000	25,000	300,000
9. Total	32.68	203,250	191,293	206,367	202,208	207,785	2,478,293
10. Return (6½ per cent)	10.53	65,559	65,558	65,559	65,559	65,559	786,707
11. Cost of service	43.21	268,809	256,851	271,926	267,767	273,344	3,265,000
12. Revenue from all sources	41.15	255,982	227,547	273,848	275,067	286,813	3,315,000
13. Surplus	*2.06	*12,827	*29,304	1,922	7,300	13,469	50,000
14. Amortization of deficit	.67	4,167	4,167	4,166	4,167	4,167	50,000
15. Profit and loss	2.73*	16,994*	33,471*	2,244*	3,133	9,302	.....
16. Car-miles	.....	622,069	575,182	634,290	617,985	639,852	7,618,914
17. Revenue passengers	.....	3,627,129	3,220,914	3,882,343	3,899,771	4,067,571	47,000,000
18. Item 6—per car-mile	.....	25.5 cents	25.5 cents	25.5 cents	25.5 cents	25.5 cents	25.5 cents
19. Car-miles per revenue passenger	.....	.1715	.1786	.1634	.1585	.1573	.1621

*Deficit.

TABLE II—EXPENDITURES FOR JANUARY, 1922, COMPARED WITH "NORMAL"

This comparison shows the actual expenses for January compared with the normal. A comparison of this kind is made up at the end of each month.

	Normal	Actual Amt. Expended	Below Amount	Below Normal Per Cent	Above Amount	Above Normal Per Cent
1. Maintenance of way and structures	$14,562.00	$12,365.71	$2,196.29	15.08	.....	.....
2. Maintenance of equipment	17,798.00	16,007.74	1,790.26	10.06	.....	.....
3. Traffic	412.00	563.07	.....	.....	$151.07	36.67
4. Conducting transportation	99,047.00	93,139.26	5,907.74	5.96	.....	.....
5. General	26,808.00	26,181.86	626.14	2.34	.....	.....
6. Total	158,627.00	148,257.64	10,369.36	6.54	.....	.....
7. Renewal and replacement reserve	19,623.00	19,516.28	106.72	.54	.....	.....
8. Taxes	25,000.00	23,000.00	2,000.00	8.00	.....	.....
9. Total	203,250.00	190,773.92	12,476.08	6.14	.....	.....
10. Return (6½ per cent)	65,559.00	65,325.38	233.62	.36	.....	.....
11. Interest on deficit	.....	1,087.51	.....	.....	1,087.51	100.00
12. Cost of service	268,809.00	257,186.81	11,622.19	4.32	.....	.....
13. Revenue from all sources	255,982.00	256,104.25	.....	.....	122.25	.05
14. Car-miles	622,069	621,267	802	13	.....	.....
15. Revenue passengers	3,627,129	3,620,425	6,704	.18	.....	.....

TABLE III—COMPARISON OF UNITS—ACTUAL WITH NORMAL

This is a comparison of units, actual with normal, for January, 1922. Figures are made up in this way for the month and for the year to date.

	—January— Normal Cents	Actual Cents	Year to Feb. 1 Normal	Actual
1. Item 6 per car-mile	25.5000	23.8638	Same as month	
Item 6 per revenue passenger	4.3733	4.0950		
2. Cost of service per car-mile	43.2121	41.3971		
Cost of service per revenue passenger	7.4111	7.1038		
3. Revenue from all sources per car-mile	41.1501	41.2229		
Revenue from all sources per revenue passenger	7.0574	7.0739		
4. Car-miles per revenue passenger	.1715	.1716		
Revenue passengers per car-mile	5.8308	5.8275		

TABLE IV—DAILY NORMAL LINE STANDARDS FOR JANUARY, 1922

This standard of service in car-miles per revenue passenger is made up as a guide for the company to follow during each month.

	Saturday	Sunday	Weekday	Month
1. Normal	0.1918	0.2117	0.2157	0.2110
2. Madison	0.1495	0.1667	0.1576	0.1574
3. Raleigh	0.2597	0.2466	0.2558	0.2552
4. Binghamton	0.1745	0.2393	0.1998	0.2011
5. Central-Poplar	0.1525	0.1876	0.1603	0.1637
6. Lamar	0.1562	0.1974	0.1734	0.1739
7. Crosstown	0.3858	0.3315	0.3480	0.3496
8. Beale-Lane	0.1539	0.1751	0.1479	0.1531
9. Linden	0.1342	0.1455	0.1375	0.1382
10. Peabody	0.1411	0.2044	0.1632	0.1646
11. Wellington	0.1477	0.2263	0.1846	0.1844
12. Second-DeSoto Park	0.1411	0.1946	0.1601	0.1619
13. Thomas-Florida	0.1340	0.1480	0.1447	0.1435
14. Chelsea-Lauderdale	0.1962	0.1830	0.1876	0.1883
15. Jackson Railroad Stations	0.1495	0.1616	0.1657	0.1627
16. Forest Hill	0.1447	0.1561	0.1431	0.1452
17. Hollywood	0.2115	0.2203	0.2382	0.2313
18. Riverside	0.5137	0.7997	0.6286	0.6309
Total	0.1626	0.1832	0.1710	0.1714

TABLE V—DAILY NORMAL LINE STANDARDS FOR JANUARY, 1922

This table is similar to that shown in Table IV except that it gives the standard earnings per car-mile for each route.

	Saturday Cents	Sunday Cents	Weekday Cents	Month Cents
1. Normal	36.78	33.31	32.70	33.42
2. Madison	47.17	42.31	44.75	44.80
3. Raleigh	27.16	28.60	27.57	27.64
4. Binghamton	40.43	29.48	35.31	35.08
5. Central-Poplar	46.25	37.59	43.99	43.09
6. Lamar	45.15	35.73	40.67	40.56
7. Crosstown	18.28	21.28	20.27	20.17
8. Beale-Lane	45.83	40.28	47.68	46.06
9. Linden	52.54	48.48	51.30	51.05
10. Peabody	49.98	34.51	43.22	42.85
11. Wellington	47.74	31.17	38.21	38.24
12. Second-DeSoto Park	49.98	36.24	44.05	43.56
13. Thomas-Florida	52.62	47.66	48.73	49.15
14. Chelsea-Lauderdale	35.94	38.54	37.59	37.45
15. Jackson Railroad Stations	47.18	43.65	42.57	43.36
16. Forest Hill	48.75	45.18	49.28	48.56
17. Hollywood	33.35	32.01	29.61	30.50
18. Riverside	13.73	8.82	11.22	11.18
Total	43.37	38.50	41.24	41.15

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Horace Johnson, City Commissioner of Public Utilities, is in active and constant touch with the city's side of the plan.

An important part of the franchise adopted was that relating to traffic standards. On this point, Mr. Harris' original report read in part as follows:

Traffic Check

As a guide to distributing service, regular periodic checks should be made during the rush hours of traffic on each route once each week, not including Saturday, and at least once a month on Saturdays and Sundays by a permanent force of trained inspectors. The information thus obtained should be compiled in permanent record for comparison, showing the traffic by twenty-minute periods, number of cars observed, maximum and minimum loads. These checks should be made at points listed as follows:

Main and Market, Third and Poplar, Madison and Marshall, Third and Beale, Main and Vance.

Line Standards

There should be determined for each route, just prior to the beginning of each month, a daily line standard that is seasoned with good judgment and policy and predicated on an equitable relation between fare, rate of cost, volume of business, physical conditions along each route, and the immediate future business outlook. These standards should be a guide for determining the total car mileage to be operated. This amount should not be exceeded in the schedule.

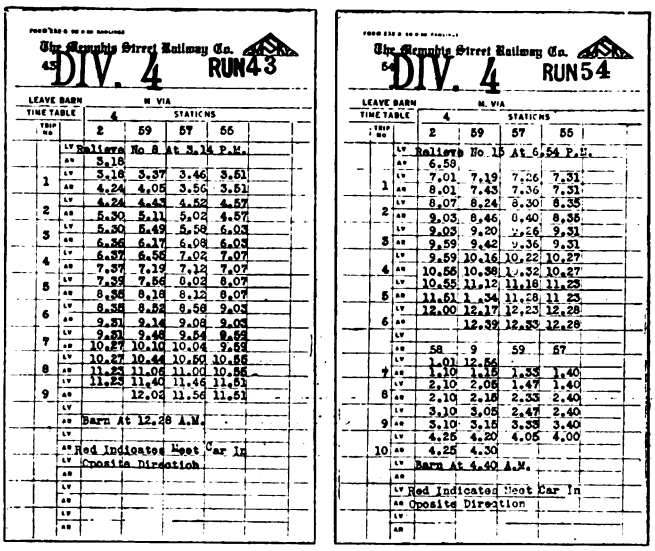
Such a system for determining line standards and distributing service, the details of which will be found in this report, should be put into effect at the earliest possible date. Fairness to the public and company and good business procedure demand it. There is no necessity to delay putting such a plan into effect on account of changes in car routing.

Design of Schedules

Every effort possible should be made to establish a system of flexible schedules that may be readily changed on short notice properly to compensate for current fluctuations of rate of cost and volume of business. Such schedules should be limited on one side by the readiness-to-serve element of service and on the other side by an equitable relation of the elements of cost of service. The daily car mileage over that required for readiness-to-serve service should be distributed proportional to traffic as to volume, length of ride and time of riding. The traffic thus referred to is that observed at points of maximum loading in excess of that accommodated by cars in readiness-to-serve service.

Later in his report, Mr. Harris expands this idea of fixing a standard of service at length, but fundamentally this is the hypothesis upon which the whole plan is based: "There are, thus, two ways to view the question of a standard of service, as follows: (1) Shall service be determined by the existing fare, or (2) Shall the fare be made adequate to meet the cost of service demanded by the public?"

The conclusion is that the standard of service must be predicated upon a consideration of both factors, namely,



The Memphis Street Railway Co.

DIV. 4 RUN 43

LEAVE BARN			VIA		
TIME TABLE			4	STATIONS	
TRIP No.		2	59	57	55
	LV	Relieve No 8 At 3.14 P.M.			
	AR	3.18			
1	LV	3.18	3.37	3.46	3.51
	AR	4.24	4.05	3.56	3.51
	LV	4.24	4.43	4.52	4.57
2	AR	5.30	5.11	5.02	4.57
	LV	5.30	5.49	5.58	6.03
3	AR	6.36	6.17	6.08	6.03
	LV	6.37	6.56	7.02	7.07
4	AR	7.37	7.19	7.12	7.07
	LV	7.38	7.56	8.02	8.07
5	AR	8.38	8.18	8.12	8.07
	LV	8.38	8.58	8.58	9.03
6	AR	9.31	9.14	9.08	9.03
	LV	9.31	9.48	9.54	9.58
7	AR	10.27	10.10	10.04	9.58
	LV	10.27	10.44	10.50	10.55
8	AR	11.23	11.06	11.00	10.55
	LV	11.23	11.40	11.46	11.51
9	AR		12.02	11.56	11.51
	LV				
	AR	Barn At 12.26 A.M.			
	LV				
	AR	Red Indicates Meet Car In Opposite Direction			
	LV				
	AR				
	LV				
	AR				

The Memphis Street Railway Co.

DIV. 4 RUN 54

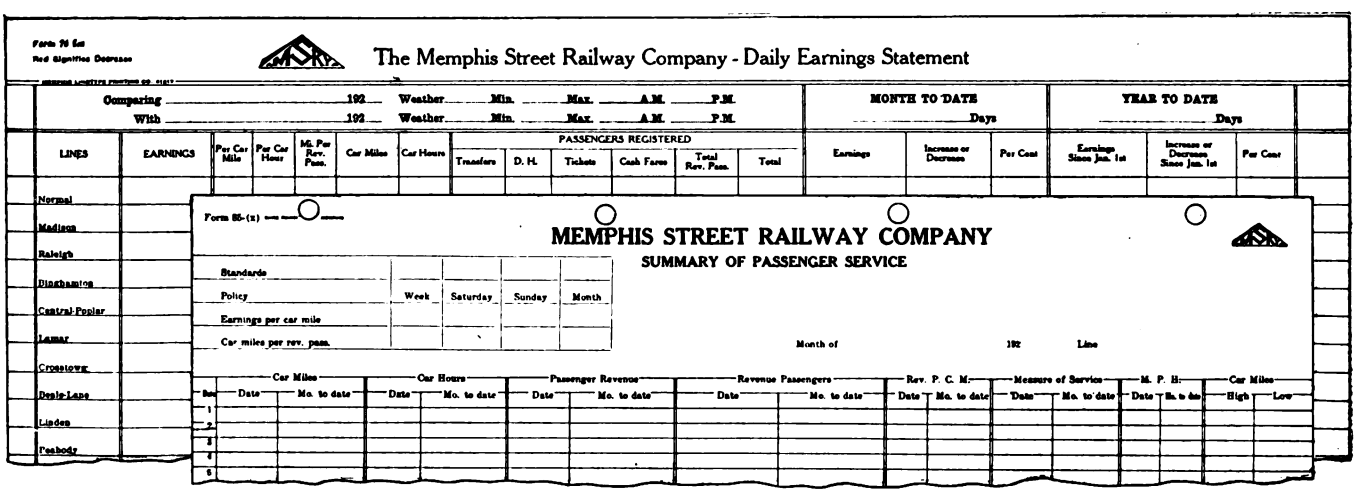
LEAVE BARN			VIA		
TIME TABLE			4	STATIONS	
TRIP No.		2	59	57	55
	LV	Relieve No 15 At 6.54 P.M.			
	AR	6.58			
1	LV	7.01	7.19	7.26	7.31
	AR	8.01	7.43	7.36	7.31
	LV	8.07	8.24	8.30	8.35
2	AR	9.03	8.46	8.40	8.35
	LV	9.05	9.20	9.26	9.31
3	AR	9.59	9.42	9.36	9.31
	LV	9.59	10.16	10.22	10.27
4	AR	10.56	10.38	10.32	10.27
	LV	10.55	11.12	11.18	11.23
5	AR	11.51	1.34	11.28	11.23
	LV	12.00	12.17	12.23	12.28
6	AR		12.39	12.33	12.28
	LV				
	AR	58	9	59	57
	LV	1.01	12.52		
7	AR	1.10	1.15	1.33	1.40
	LV	2.10	2.05	1.47	1.40
8	AR	2.10	2.18	2.33	2.40
	LV	3.10	3.05	2.47	2.40
9	AR	3.10	3.15	3.33	3.40
	LV	4.25	4.20	4.05	4.00
10	AR	4.25	4.30		
	LV	Barn At 4.40 A.M.			
	AR				
	LV	Red Indicated Meet Car In			
	AR	Oposite Direction			
	LV				
	AR				

FIG. 1—TIME TABLE FOR RUNS 43 AND 54 ON DIVISION 4. TIME TABLES LIKE THESE ARE CARRIED BY EACH TRAIN CREW

service as limited by the cost and the fare, and service as fixed by public requirements. A description of the manner in which the operation is carried on will serve to indicate both the method which was finally agreed upon and the manner in which it is now working.

To start with, operating with past experience as a basis, an estimated budget for the year is produced by Mr. Harris after full conference with and approval by the operating officials of the company and the Commissioner of Utilities for the city, as a basis for the entire operations of the year. This budget is made up by months, and is known as "Monthly Normals." A copy of this estimated budget for the first five months of 1921 and for the year is shown in Table I. In this table as reproduced, only the car-mile figures for January are given, but in the actual form each item for each month is shown on a car-mile basis. As will be seen the figures for 1922 are based on the estimated cost of 25½ cents per car-mile. In 1921 the figure was 28 cents per car-mile.

At the end of each month, after the month's expenditure has been calculated, the management fills in the actual expenditure for comparison and check. The amounts actually expended are compared with the estimated, or normal expenses and the per cent, above and below are calculated, as shown in Table II, which is the record for January, 1922. The figures for later months are kept on a cumulative basis for the year, but this obviously is not shown in a January statement.



The Memphis Street Railway Company - Daily Earnings Statement

Comparing ____ 192__ Weather ____ Min. ____ Max. ____ A.M. ____ P.M.
With ____ 192__ Weather ____ Min. ____ Max. ____ A.M. ____ P.M.

MONTH TO DATE ____ Days | YEAR TO DATE ____ Days

LINES	EARNINGS	Per Car Mile	Per Car Hour	Mi. Per Rev. Pass.	Car Miles	Car Hours	PASSENGERS REGISTERED: Transfers	D. H.	Tickets	Cash Fares	Total Rev. Pass.	Total	Earnings	Increase or Decrease	Per Cent	Earnings Since Jan. 1st	Increase or Decrease Since Jan. 1st	Per Cent
Normal																		
Madison																		
Raleigh																		
Binghampton																		
Central-Poplar																		
Lamar																		
Crosstown																		
Poplar-Lane																		
Linden																		
Peabody																		

Form 85-(x)

MEMPHIS STREET RAILWAY COMPANY

SUMMARY OF PASSENGER SERVICE

	Week	Saturday	Sunday	Month
Standards				
Policy				
Earnings per car mile				
Car miles per rev. pass.				

Month of ____ 192__ Line ____

No.	Car Miles: Date	Mo. to date	Car Hours: Date	Mo. to date	Passenger Revenue: Date	Mo. to date	Revenue Passengers: Date	Mo. to date	Rev. P. C. M.: Date	Mo. to date	Measure of Service: Date	Mo. to date	M. P. H.: Date	Mo. to date	Car Miles: High	Low
1																
2																
3																
4																
5																

FIGS. 2 AND 3—UPPER PART OF DAILY EARNINGS STATEMENT KEPT BY LINES. SUMMARY OF PASSENGER SERVICE, IN WHICH COMPARISON IS MADE WITH "NORMAL" SERVICE

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As soon as this estimate has been compiled for each month, a copy is submitted to the city, together with the comparison given in Table III, which shows the principal items on a car-mile and revenue-passenger basis, normal and actual, as well as the car-miles per revenue passenger and revenue passengers per car-mile, normal and actual.

On the basis of this monthly report and comparison, the standards of car-miles per revenue passenger and earnings per car-mile by lines for the next succeeding month are compiled. These are in the forms shown in Tables IV and V, which were drafted for January, 1922, in December, 1921. The great apparent differences in scheduled service between certain of these lines, when measured on a car-mile per revenue-passenger basis, are due to local conditions. For instance, the Riverside line, which shows by far the highest proportion between car-miles and passengers, operates only one car.

RELATION OF ACTUAL AND EQUITABLE SERVICE
Memphis Street Railway Co.

Daily Report For Tuesday 1-31-22

	EARNINGS		CAR MILES		CAR MILES FOR DAY		MONTH TO DATE CAR MILES	
	Standard per Car Mile	Actual Amount	Equitable	Actual	High	Low	High	Low
1. Normal	32.70¢	$283.43	867	800		7		440
2. Madison	44.75	989.52	2211	2175		36		762
3. Raleigh	27.57	320.46	1162	1117		45		37
4. Binghamton	35.31	310.24	879	843		36	429	

FIG. 4—DAILY REPORT TO CITY CONSULTING ENGINEER, BY LINES SHOWING VARIATIONS FROM THE NORMAL

THE SCHEDULE PREPARED FROM A BUDGET ALSO

With these standards before it the company has to build up its schedules. They are prepared on the basis suggested in Mr. Harris' original report, which is to take traffic counts at points of maximum load and allow an average in the morning and afternoon peaks of 60 per cent overload for large cars and 40 per cent for small cars, and of one-third of a load in non-rush hours.

From the number of seats thus determined it is possible to calculate the number of cars to pass that point, and from the length of run and schedule speed, the number of cars, number of trips and the number of car-miles can be obtained. With the number of car-miles and the number of passengers it is possible to calculate the measure of service—the car-miles per revenue passenger. If this comes out either low or high, the schedule is changed.

All stopping points for cars are marked by a "car-stop" sign on the span wire, and these signs are spaced eight to the mile in the business districts, six to the mile in the residential districts and four to the mile in the suburban districts. Since the adoption of this plan it has been possible to increase the schedule speed of the cars, which in the month of April, 1922, was 10.1 m.p.h.

From the route schedules determined in the way already described the run schedules are prepared. They are typewritten on the form shown in Fig. 1 and a copy is given to each crew. As will be noted, all divisions, runs, time-tables and stations are numbered.

TABULATION OF RESULTS

In operation, daily reports by routes and monthly reports by days are compiled. The upper parts of these blanks are reproduced in Figs 2 and 3. A daily comparison of the actual and equitable figures are also filed with the city on the form shown in Fig. 4, which gives the record for Jan. 31, 1922. This goes as a report to the City Commissioner, so that he can keep in daily touch with the service given. This record can be used to check complaints of the service on any particular line. It has been found that this one feature alone has aided materially in having the public gain a conception of the fact that it was getting its money's worth all of the time and that the city was keeping close watch upon the railway to see that the standard of service was continually maintained.

Of course, from this performance record it is possible to redistribute service when the record indicates that the service provided on various lines is either high or low. A franchise of this kind has been found in Memphis to be a great incentive to the operating force. The objective is clear, and each division and department feels it must do its part or fall behind. Weekly meetings of the traffic men and of all the operating officials permit opportunity for weekly checks.

Though a number of blanks used are not reproduced in this article, the accounting work required is not complicated. Only one man has been added to the accounting force to supply these data as compared with those formerly prepared. In recompense, the general superintendent is kept in daily touch with his system, whereas before it was very difficult to obtain actual figures until after eight or ten days. The system seems to be giving equal satisfaction to the public.

The theory of the system is such as naturally to bring about these feelings. Briefly it is that the city dictates the number of cars desired, though held down to certain limits so as to prevent extravagant service. The company carries out these orders in the most economical manner and its reward is proportioned to the economy which it exercises. The fare is only that required to pay operating expenses and a reasonable return on an investment already recognized by the city.

Boston Railway Reference List

A LIST of the literature on electric railway transportation in different cities in the library of the Boston Elevated Railway has been compiled by L. A. Armistead, librarian of that company. The references are complete as regards original reports, addresses and books contained in the library, but periodical literature is listed only when other references are lacking. The reason for this is that most technical periodicals issue indexes in which these references can be readily found. As a typical list, the following is given on Milwaukee:

Arnold, B. J., Dec. 1, 1910. Pittsburgh Transportation Problem. Reserves for depreciation, page 118. Low earnings per mile of track, page 130, etc.

Doolittle, F. W., 1916. Definition satisfactory service, page 207. Opinions as to comfortable load, page 201. Basis of valuation, depreciation, allowances and rate of return, page 451, etc.

Hagenah and Erickson, Oct. 26, 1918. Examination of accounts of M.E.R.& L. Co., for Employees M.B. Assn.

Mass. St. Ry. Commission, 1918. Senate 300, page 274.

Neal and Richey, 1917. Report on Western Trip with Mass. Spec. St. Ry. Comm.

Public Service Ry. Co. of N. J., March 1919. Zone system in Milwaukee, page 31.

Wisconsin Ry. Comm., Aug. 23, 1912. Fare case, annual depreciation, efficiency statistics, etc.

Wisconsin Ry. Comm., June 1, 1918. Rates of fare, zone limits, orders affecting service.

Wisconsin Ry. Comm., April 4, 1919. Decision in rate case, zone limits, service standards.

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The Baltimore Plan of Parking Regulation

How the Law Was Enacted—Co-operative Work of Railway Company and Automobile Club Educated the Citizens of Baltimore to See the Necessity of Automobile Parking Regulations in Order to Expedite Travel

BY JOHN E. CULLEN
Assistant to the President
United Railways & Electric Company of Baltimore, Baltimore, Md.

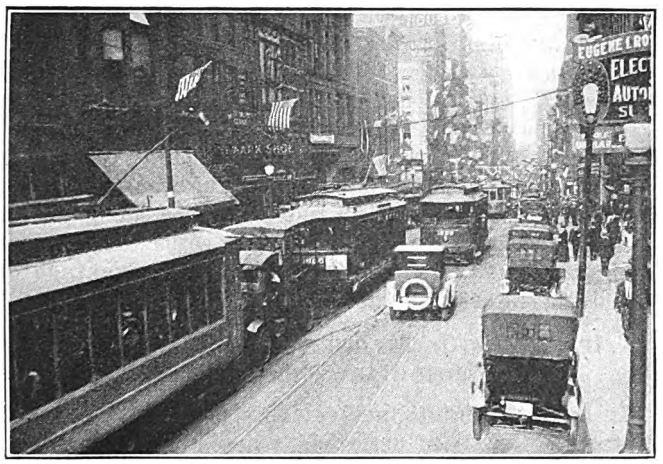
A GREAT DEAL has been said about "the Baltimore plan" for the regulation of automobile parking, but I have always doubted if we were the pioneers. I have understood that several cities tried out one or two parts of our plan before our law was passed, and so, at the outset, it must be understood that the object of this article is not to boast about "the Baltimore plan," but is more for the purpose of explaining its fundamentals, and, what is more important, how it became a law.

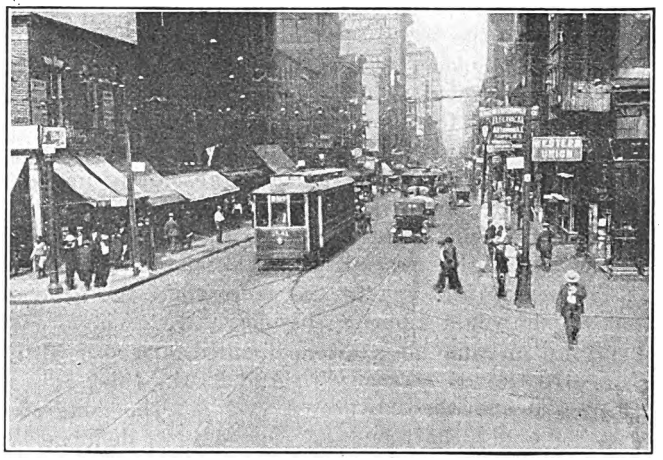
First of all, it was based on the assumption by the United Railways of Baltimore that the automobile was a great thing; that the citizens of Baltimore were entitled to own automobiles and that the automobile had a right to be on the street, even when it was standing still. And, then, it was based on the assumption by the Automobile Club of Baltimore that, as the street cars daily carried 900,000 persons, those people were entitled to a ride unimpeded except by necessary delays, and one of the unnecessary delays had as its sole cause the unrestricted and selfish parking of automobiles on certain streets at certain hours. It sounds rather sophomoric, perhaps, to state those two points and then, with the gesture of a man taking a rabbit out of a high hat, say, "and there you are."

But there we were—and it was the end of a long, long trail which stretched back to the days when the Baltimore street railways thought that the best solution of the automobile problem was to burn all automobiles, shoot all chauffeurs and make everybody ride on street cars, and the automobilists were for clawing up all the street car tracks and getting a smooth paved street, minus street cars, children, other people, other people's automobiles and speed cops.

This article is for a street railway man's magazine; therefore, I feel fairly safe in assuming that, except for some blessed saint among the general managers and the superintendents of transportation, all will not mind acknowledging this was their frame of mind. As for the automobilist, he will readily admit all I have said.

The Baltimore law was born in a period of repentance by both sides, and now that we are leading a life which is surrounded by the odor of unselfishness and sanctity —we would not change. It came about in this way: Late in 1918 we went through a hearing before the Public Service Commission on our petition for a 6-cent fare. The people's counsel for the commission, Osborne I. Yellott, was also counsel to the Automobile Club, and a pioneer automobilist. Mr. Yellott was recently killed in his machine and his death was a great shock to Baltimore. I am sure that Mr. Yellott, were he living, would not mind my saying that during the trial of the 6-cent case he gave our company one of the worst drubbings it had ever received, and, incidentally, complained of the slowness of our cars.





AT LEFT, LOOKING EAST ON BALTIMORE STREET AT EUTAW, SHOWING PARKED CARS. EVERY MOVING VEHICLE IS IN THE CAR TRACKS. THIS IS A "TWO-LANE" OF TRAVEL STREET AND EVERYTHING MUST MOVE AT 4:30. NO PARKING OF ANY KIND AFTER THAT HOUR. AT RIGHT, SAME VIEW AS AT LEFT, EXCEPT THAT IT IS 4:45 P.M. AND EVERYTHING IS MOVING

I am quite willing to agree that the company deserved all it got (including the raise in fare) and so it was with the confidence of a long friendship with Mr. Yellott and a knowledge of his fairness that I went to his office one day, soon after the close of the fare case, and said: "Let's try to get together on a parking law that will change this situation downtown and help speed up our service. You have attacked us on our slowness —let's see if we can start the reform by working out some answer to the parking problem."

At that time our cars crawled through the downtown streets, hemmed in on both sides by machines, many of them parked so carelessly that the motormen frequently had to get out and kick a wheel over the rail far enough for clearance. It was requiring twenty minutes to go eight blocks, and cars were hopelessly off schedule because of delays in the business district. Mr. Yellott's reply was entirely correct.

He said, "What's the use of trying to do business

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with you fellows when you want to hog the streets and not let anybody else on them?" We were old friends, however, and we both had our own ideas about the selfishness of both sides. We agreed to meet a few days later. Meanwhile, I was to get *carte blanche* from my company to agree to anything and he promised to persuade the Automobile Club to accept whatever he agreed on. And this is what we finally worked out; and this is the spirit of the Baltimore traffic law.

THE INTERESTS OF THE MAJORITY SHOULD CONTROL

Ordinary delays caused the street car by the automobile, or the automobile by the street car, are all "in a day's work," and are to be accepted by each as a necessary part of the modern traffic situation. However, there are certain times when the *number of persons concerned* must be the determining factor and, using this basis, there could then be no doubt that in the home-going time in the evening a street car with eighty persons should not be impeded by an automobile with a few persons in it—and certainly not by an empty machine which awaited the pleasure and convenience of its owner or driver.

But, we decided, any law which gave this deserved preference to the street car riders should not be applied except at the places where it was needed and at the time it was needed. This was an obvious point. The parking law in force at that time prohibited parking lasting more than two hours. It was a poor law; was only enforced occasionally and was absolutely unnecessary on a large majority of the streets.

What Mr. Yellott and I were trying for was the kind of law which the man with the automobile could *see* was necessary and yet, at the same time, the kind of law which would remedy the downtown delays. We finally hit on what he afterward called, and very aptly, "the yardstick of necessity." And it was this:

First, define the downtown section; the congested area. We did that, and it was easy to define. We took the limits of the downtown section which was guarded by traffic police. There always is the surest method and we used it.

Second, we adopted what I have always thought was the soundest part of our plan. We said that on those streets which were wide enough to accommodate on each side a moving street car, a moving automobile and a parked automobile, exactly parallel with each other, there was no necessity for the prohibition of parking at any time. This meant that the street car tracks were for the free movement of street cars, and at the evening rush hour when cars were practically bumper to bumper the tracks were for the exclusive use of the street cars. It meant, also, that there was a moving lane of traffic to the right of the street car which was for the use of automobile and other traffic and that it was assumed that, except for unnatural delays, this lane would provide freedom and rapid transit for the automobile. In many cases the rate of speed achieved by the automobile in its lane of traffic is greater than that of the street car, as will be explained in a later article, when we get to the safety island part of the plan.

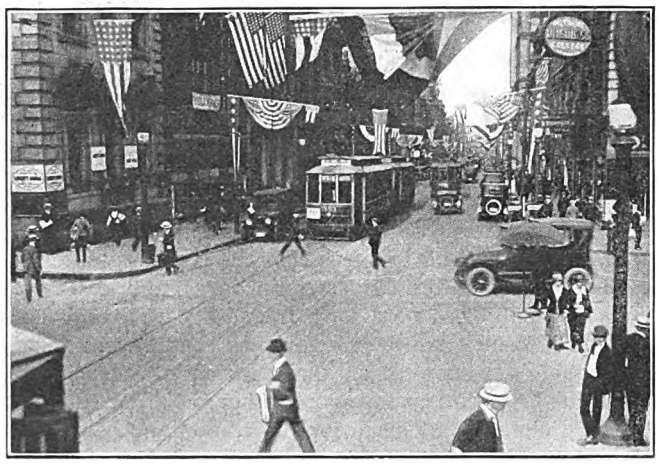
What Mr. Yellott and I had in our minds was that something had to be done to get the automobile out of the car tracks in the rush hour in the evening. Every street downtown was so littered with parked automobiles that on most of them there was only one open liquid lane of travel in either direction, and that was the space occupied by the car tracks. It was not an uncommon thing for street cars which should have been 5 ft. or 10 ft. apart to be separated by the space of sixteen automobiles, simply because nothing moved on those streets except in the car tracks.

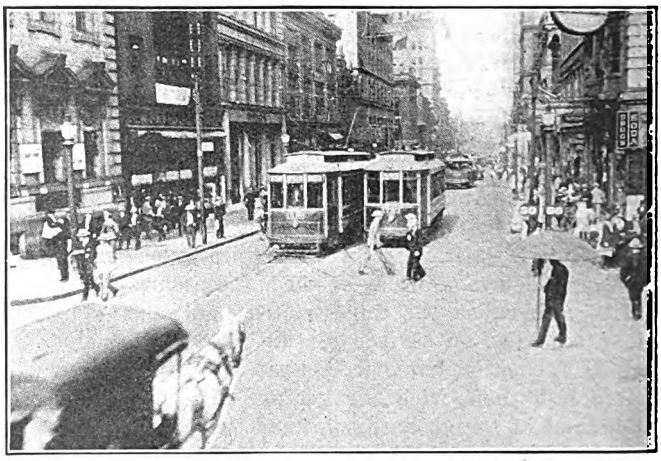
The disarrangement of schedules can be imagined. Cars on heavy lines which should have been forty-five seconds apart were limping along at the time interval of three or four minutes between them. What was visualized and what actually came true was that if we gave moving automobilists a clear space alongside of the car tracks they would not only cease to interfere with the street cars but would have the advantage of not being interfered with.

IF PARKING IS ALLOWED, A TIME LIMIT DOES MORE HARM THAN GOOD

It is important to note at this point that on such a street as has been described, where there is room on each side for a moving street car, moving automobile and parked machine, we not only did not prohibit parking, but we put no restriction on it whatever. This should be borne in mind in the making of any parking law; that if there is no obvious necessity for prohibiting parking, then such a prohibition is not only foolish but hurts the entire cause of traffic regulation.

I have often doubted the wisdom of laws which fix one and two hours as the limit for parking. They are





AT LEFT, LOOKING EAST ON BALTIMORE STREET AT LIGHT STREET. CARS PARKED ON SIDE LEAVE ONLY LANE OF TRAVEL FOR ALL TRAFFIC. AT RIGHT, SAME AS AT LEFT, ALL PARKING OVER, AND STREET IS CLEAR ON RIGHT FOR AUTOMOBILE TRAFFIC. TIME 4:40 P.M.

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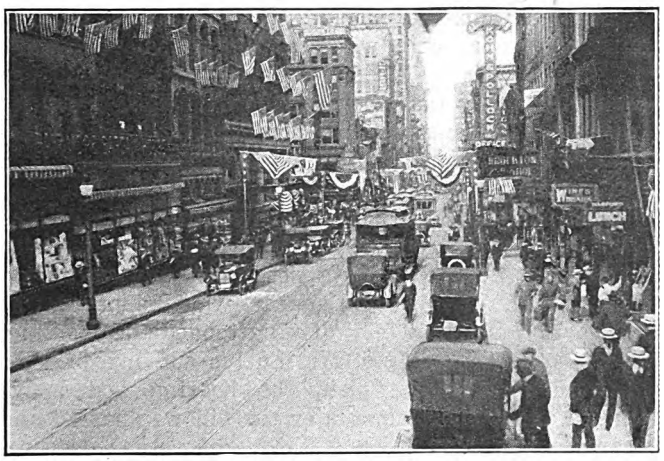
very difficult in enforcement and, so far as the street railway man is concerned, I personally think that the parked automobile is better for us when it "stays put," rather than having it jump in and out of traffic every half hour. Certainly it is more important that during the evening rush hour everything move than it is to have constant moving during the day.

Still applying the "yardstick" of necessity and what seemed to us a very sound reason, we determined that, on all streets in the congested district where there were only two lanes of travel on either side of the



LOOKING EAST ON BALTIMORE STREET FROM HOWARD STREET. EVERYTHING IN THE CAR TRACKS

THERE IS A CLEAR PATH TO THE RIGHT FOR THE USE OF THE AUTOMOBILE

street, beginning at 4:30 p.m. everything on that street must move. That meant that automobiles could park there all day long if they desired, but at 4:30 the car tracks were for moving street cars, and the travel lane to the right of the car tracks was for moving automobiles and other vehicles. On such a street as this, even one parked machine in any block would immediately force all moving traffic into the street car tracks. Having arrived at this general agreement, we started to apply the principle to the map of the congested area.

First of all we exempted all streets on which there were no car tracks. There are streets, of course, where there are no tracks, which are so narrow that parking is dangerous, but we left those to the general authority of the police department, which under the public safety laws has plenty of authority to regulate the parking on such streets. This law was to be one of absolute necessity, and we left to the police department the job of judging the necessity on trackless streets. Then block by block where there were tracks we applied the yardstick, first for width and then for that other and tremendously important factor—"the time parking should not be allowed."

And the reason why that is important is because on some of the streets which were narrow there was absolutely no sense in prohibiting parking up until the evening rush hour, when the number of street cars passing through that street is suddenly tripled and the number of automobiles augmented in probably the same ratio. In other words, there were many blocks where parking during the day did not interfere with our cars in the slightest way—so we asked for the prohibition only when it was needed.

Then we had to determine the hours of necessity. This was very important and as we found afterward was to give us the greatest amount of trouble. We fixed on them from 4 p.m. to 7 p.m., with the idea that 4 p.m. was probably a little too early, but by that time both Mr. Yellott and myself were so enthusiastic that we were making concessions to each other and trying to build what we thought was an ideal law.

And so he wrote the law. Since his death I have had brought back to my mind how splendid he was and how interested he was that afternoon when we went over the map, block by block, and determined how we would stand.

We each had a fairly easy time with our own people. The Automobile Club, which invariably accepted his judgment, had the added advantage of a president and secretary who were broad-gaged leaders; who saw that some change must be made in the parking situation and who were far-sighted enough to see that if the selfish motorist was allowed to clog up the main highways of travel for 900,000 persons, they would ultimately bring down upon all of the decent motorists laws which were too harsh and certainly undeserved. John S. Bridges, the club's president, and H. M. Lucius, the secretary, immediately threw themselves into the fight for the passage of the Yellott law and never wavered in their determination to co-operate with us to solve a difficult problem.

EVERYBODY AGREED TO THE LAW BEFORE IT WAS PRESENTED

Thomas A. Cross, who was then president of the United Railways, and Herbert B. Flowers, our general manager, both agreed to the Yellott bill and it was with the encouragement of this reception that Mr. Yellott and I determined to attempt what had never been attempted before on such a law; that was to get every one concerned to agree on its provisions before it was presented to the City Council and thus insure its speedy passage and preserve its original form.

We were in for "breakers ahead" before long, but the result justifies the declaration that this is the only practical method of passing such a law, and, what is more important, having it enforced.

We submitted the proposed law to the Merchants and Manufacturers' Association, the Retail Merchants' Bureau, the Charles Street Merchants and the Automobile Club executive committee. From the start the real fight developed on the hour at which the parking prohibition would become effective, and 4 p.m. was unanimously attacked by the merchants affected. They said that if persons owning automobiles could not park

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on certain downtown streets after 4 o'clock, the business of the stores would practically be over at that hour, while the closing hour at that time was 5:30.

This was complicated by the fact that in one portion of the shopping district the streets were wide enough to escape, by our yardstick method, any prohibition of parking; while on others, where were located some important stores, the streets were narrow and the no-parking rule was badly needed. Such a condition made the merchants in the proposed "unlimited parking" area very self-conscious, particularly after some of the not-so-level-headed merchants started rumors that we were trying to favor the other side. These rumors made the unaffected merchants get into the fight so as to prove their allegiance to the Retail Bureau, and for several weeks things looked very dark indeed.

It is a pleasure to record how splendidly the Automobile Club acted in those bad days. Mr. Yellott by this time was busy on other things, but Mr. Bridges and Mr. Lucius, aided by several members of their board, continued the fight and every effort which was made to get the Automobile Club to desert us only made these gentlemen stronger in their faith in the proposed law.

Finally Mr. Yellott and I agreed that it would be proper for us to compromise with the merchants by changing the hour of parking prohibition from 4 p.m. to 4:30 p.m. When this was announced to the merchants, many of them realized that it was all that could be expected from us and, except for several "bitter-enders," we from that time on had them with us. We were careful to explain that, beginning at 4:30 p.m., our tracks downtown were saturated with street cars which were moving according to schedule and getting into position where they would play their part in the evening rush hour.

It was difficult for the merchants at first to see that car-peak came before passenger-peak—that is, that we had our cars on the tracks before the opening of the actual passenger-peak. This meant that the time between 4:30 and 4:45 would witness a considerable traffic peak because of automobiles which would pull out of berths on restricted streets. This would give us only a few minutes before 5 o'clock in which to get the downtown traffic moving freely on all possible lanes of travel. Obviously, if the law did not become effective until 5 p.m., the vehicular-peak coupled with the passenger-peak would make an impossible situation. We informed the merchants if the time was fixed at 5 p.m., we would have to fight against its adoption, knowing as we did that it would hurt instead of help.

All of these statements were accepted as true, and while some of the more obdurate merchants were for killing the whole plan, the Retail Merchants' Bureau, which also had splendid leadership, voted by a considerable majority to approve the plan. The other associations did likewise.

Only one other point had come up which might be of interest to readers of this magazine. I have spoken of the difficulty of enforcing the one and two-hour limit of parking. Both Mr. Yellott and I were puzzled to devise some scheme that would make a law self-enforcing, and we finally hit on a plan of placing on our trolley poles signs which told the automobilist exactly when he could and could not park. This idea was written into the law and it meant that a person about to park an automobile had only to look at the nearest trolley pole and if there was no sign on it he knew he could park there as long as he liked. If, on the contrary, there was a sign, it told him exactly what the regulations were.

We used the same idea also in enforcing another portion of the law which prohibited the parking of an automobile within 50 ft. of any crossing where a street car stopped to take on or discharge passengers. This was done so as to eliminate the evil of persons having to climb through automobiles to get to a street car. It always caused trouble because women were getting their clothes dirty and making claims.

With the heartiest kind of co-operation from the Automobile Club, we provided that a mark should be placed at the corners where cars stopped, this mark to be 50 ft. from the intersection, and automobiles would thus know that they would have to park back of the mark. This has worked splendidly, and will be discussed with other phases of parking regulations in a later article.

When the ordinance, as we had agreed upon it, was advertised by the committee of the council which was considering it, and a date set when advocates and opponents of the bill could appear, what happened was that there were only four of us attended the meeting, Mr. Yellott, Mr. Bridges, Mr. Lucius and myself. As we were all for the plan, the hearing lasted five minutes and a short time later the bill was passed and became a law, May 8, 1919. None of us has ever regretted its passage.

How the law worked and what difficulties had to be encountered in stimulating its enforcement will be told in a subsequent article.

Tramway Cars and Trolley Buses in Great Britain

AN AUTHOR writing in the April 22 issue of the *Génie Civil* reviews in extended fashion and with many illustrations the present tramway and trolley bus situation in Great Britain, in so far as the rolling stock is concerned.

The general conclusion, based on an extended study, is that while transportation vehicles in Great Britain cover a wide variety of types, one of their common characteristics is the tendency to use two decks, whether the car is for use on rails or on the roads. This preference is due to appreciation of the ability of the double-deck vehicle to transport large numbers of passengers during the peak with minimum interference with other traffic. On the other hand, one manufacturer who has furnished a number of lines with trolley buses prefers the single-deck bus, but one having a body of large capacity, such as that used by the Tees-side Rail-less Traction Board.

The author of the article quoted sees considerable virtue in the argument for two decks for Paris. He compares a double-deck bus with the last model of bus and trailer put in service before the war by the Compagnie générale des Omnibus, the whole covering a length of 82 ft. One double-deck bus, he states, can easily transport ninety persons.

He also said a good word for the electric trolley bus, for which he sees a future in France in various regions where economical and rapid means of communication are needed, but where the expense of rail lines precludes their use. Sections in the east and north of France, where water power is abundant, will profit particularly by the development of this system.

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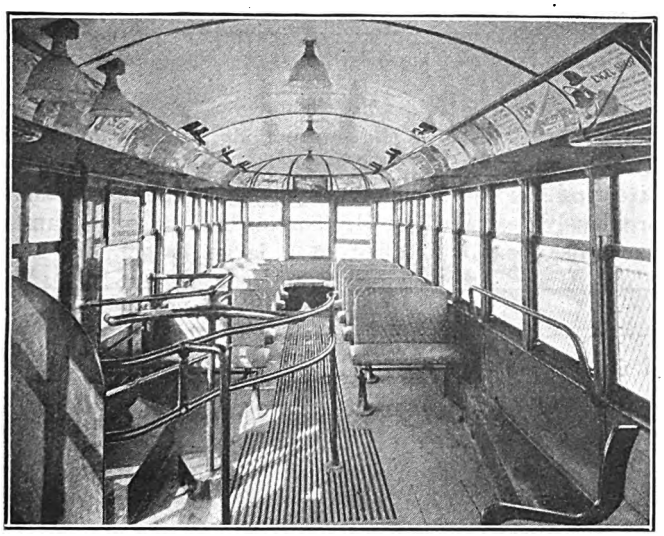
Improvement in Turnstile Cars

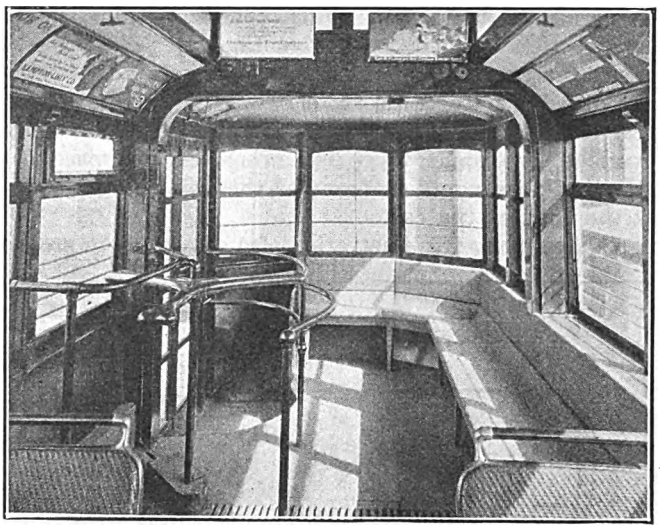
One-Man Operation with Double-Truck Cars in Utica and Syracuse Has Increased Steadily Until Now Utica Has 100 per Cent Operation—Improvements in Turnstile Arrangement Are Described

IN A paper read before the midwinter meeting of the New York Electric Railway Association in New York City on Jan. 24, 1922, H. S. Sweet, engineer of equipment for the New York State Railways, described the novel features of the cars operated by one man in Syracuse and Utica. An abstract of the paper was published in the ELECTRIC RAILWAY JOURNAL for Jan. 28, 1922. For this service double-truck cars are operated on the pay-as-you-leave principle with the rear or center doors used for entrance. Turnstiles are used to prevent exit other than at the front doors.

Since the presentation of this paper a number of improvements have been made in the construction of the turnstiles in the pipe framework for guiding passengers on entering and in the seating arrangement at the entrance. Double-end cars also have been equipped with turnstiles, which is an additional application to that previously described. This latter arrangement permits operation by either one or two men, as desired.



TURNSTILE APPLICATION TO PETER WITT CAR WITH CENTER ENTRANCE



TURNSTILE APPLIED TO REAR ENTRANCE DOOR. NOTE EXTRA SEATS AT SIDE AND REAR

The first design of turnstiles used had four arms and they were constructed of wrought-iron pipe. This pipe-constructed turnstile extended to within approximately 12 in. of the floor and reached to a height of the waist of an average person. In the illustrations used with Mr. Sweet's article there were three projections in a vertical plane for each arm and these were connected together at the ends by a pipe with a tee in the middle and elbows at the ends. The pipe barriers were also constructed with a spacing of approximately 12 in. While this construction provided an effective barrier against passengers trying to force their way underneath, in actual service such a formidable barrier was found unnecessary. In the late design the pipe framing has been simplified to a large extent and consists more of a railing for properly guiding the passengers than a formidable barrier.

The type of turnstile has also been changed from the pipe construction to a three-arm wooden type. Experiments showed that the three-arm type of construction has several important advantages. The natural tendency of passengers when using the turnstile is to turn it for more than a quarter of a turn—in fact, in most cases this is necessary in order to provide for free movement. This, then, leaves the turnstile arm, where a four-arm turnstile is used, in a position which requires further movement before the next passenger can enter, while with the three-arm type of turnstile the passenger on leaving pushes the turnstile to such a position that it can be readily entered by the next passenger. The wooden-top type of turnstile is also of very light construction, which makes it easy to move. It provides a very attractive appearance and with all corners and ends properly rounded there is no obstruction which would in any way have a tendency to cause accidents or tear clothing.

The ratcheting arrangement for the turnstile is located at the bottom of the center support and is inclosed with a sheet-iron case. As described in Mr. Sweet's paper, this has a mechanism for releasing the turnstile so that passengers can use the rear door for exit in case of emergency or at points where fare collectors are stationed to collect the fares at the rear doors to relieve congestion. This releasing of the turnstile for backward movement is entirely controlled by the operator from the front end, and an emergency application of the brake also causes the turnstile to be released as well as to permit the operation of the doors by hand. In the latest arrangement the pipe framework connected to the center support of the turnstile passes above the turnstile arm. This construction was found to be of advantage as the pipe thus forms an effective barrier and prevents the tendency of passengers to push the turnstile to a position further than is absolutely necessary for exit.

In the cars described in Mr. Sweet's paper the turnstiles were located directly opposite the entrance door.

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three-arm turnstile substituted. The latest type of construction provides a space of approximately 28 in. underneath the lowest pipe barrier. This is found of great convenience to passengers who have baggage or bundles as they can pass their baggage underneath the lowest barrier without the necessity of carrying it through the turnstile. The pipe framework is constructed of 1-in. pipe.

An accompanying illustration shows the plan of a double-end car fitted with turnstiles. The general construction and location of the turnstile and barriers are the same as for single-end cars, but of course the seat opposite the entrance and around the rear end of the car is omitted and this space is used for standing passengers or for exit when at the front end. As will be readily seen from a study of the illustration, this type of car can be used for operation by either one or two men.

In the illustration showing the front end of the car an idea can be gained of the free passage used for exit and of the arrangement of the control equipment on the platform.

The Syracuse cars are now being equipped with special safety features which provide all of those found on the standard Birney safety car and several others in addition. The fare box is located just to the right of the hand brake wheel and to the left of the passenger as he leaves the car. A lamp has been installed back of the fare box which illuminates the change tray during darkness, and a shield effectively prevents the rays of this from interfering with the vision of the operator. As a guide to passengers using this type of car a sign is hung on the front reading, "Rear Entrance," and the bulkhead has a large sign inside the car which reads, "Front Way Out. Pay as You Leave." A special form of transfer and change rack has been designed which fits on the window sill back and to the left of the fare box.

Terre Haute Starts Weekly Pass

Elephant "Sandwich-Man" Is Pressed Into Service to Supplement the Company's Newspaper and Car-Window Publicity—Large Sales Are Recorded Despite the Strike of Coal Miners

TERRE HAUTE is so well known for the way it has stimulated traffic through maintenance of the 5-cent fare and the 100 per cent use of short-headway safety cars that one might have expected the management to rest on its laurels by assuming that saturation had been attained in the street car riding habit. One need only mention that in 1913, with but 600 private automobiles, the riding index was 158 rides per inhabitant per annum, yet in 1920, with 5,500 private automobiles in the city, the riding index after falling in the pre-safety years, had risen to 176. The latter condition also obtained during 1921. According to the latest information there are now 11,000 automobiles in Vigo County, of which probably 8,000 are in Terre Haute itself.

THE PAT ARRIVAL OF A CIRCUS WAS TURNED TO GOOD USE BY A QUICK-WITTED MANAGEMENT

For all that, Edwin M. Walker, general manager, was entirely open to consider any plan that would develop revenue and riding still further. He had followed carefully the installation of the weekly unlimited-ride pass at Racine, Kenosha, Youngstown and other places, and concluded that it had merit for Terre Haute conditions. One argument for its use at Terre Haute is that the hard times had brought out some forty to fifty jitneys, part of which fulfill a legitimate job in serving areas not reached directly by the cars, but all of which are free to run as they list. They charge 5 cents, for example, during the daylight hours and 10 cents, nominally, after 7 p.m. However, by a twist of the wrist the 10-cent sign is converted to "Taxi!"

Judging by experience elsewhere, Mr. Walker believed that the jitneys would be brought to a minimum without any regulation whatsoever if the pass were used, since a passholder's privilege of unlimited street railway service cannot be duplicated by individual or even associated jitneymen.

As briefly noted in the ELECTRIC RAILWAY JOURNAL for April 15, 1922, the general publicity was laid out by Walter Jackson working in co-operation with Arthur R. Kling, the company's special publicity man. Extremely favorable news articles appeared in the two local papers, one of which, the *Tribune*, assigned its star reporter to cover the assignment and also ran a complimentary editorial on the management's forehandedness in trying a plan for lower fares and greater public usefulness. The following week the company ran advertising copy daily down to Monday, May 1, the day the passes went into use.

The effectiveness of the "buy in advance" argument may be gaged from the fact that about one-half of the total sales were made on Friday, Saturday and Sunday in advance of use. This is a record achievement, proving incidentally a world of confidence in the promises of the local railway, since the pass was a wholly novel idea to the public. Specimens of the advertising are reproduced. One important feature was the use of a picture showing how the pass should be presented on entering the car. This was held to be wiser than ordering the public to do so and so, aside from which a picture is also more effective.

In addition to the news and advertising matter mentioned, a good news story was made out of the fact

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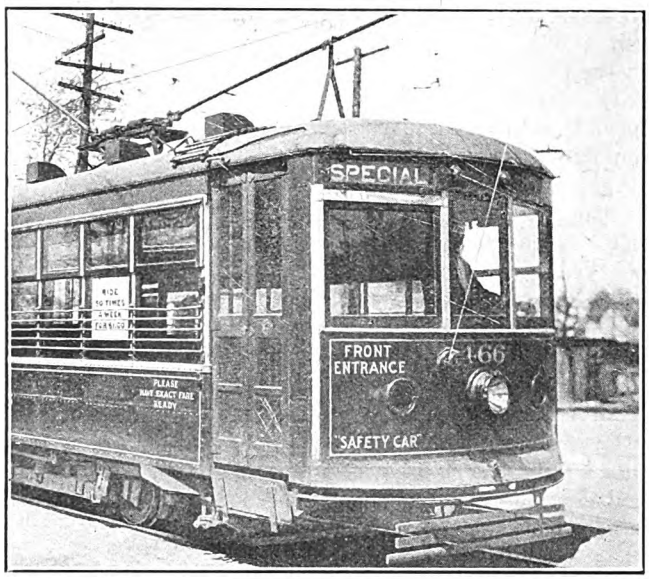


EVERY SAFETY CAR EARNED A WINDOW PLACARD, TOO

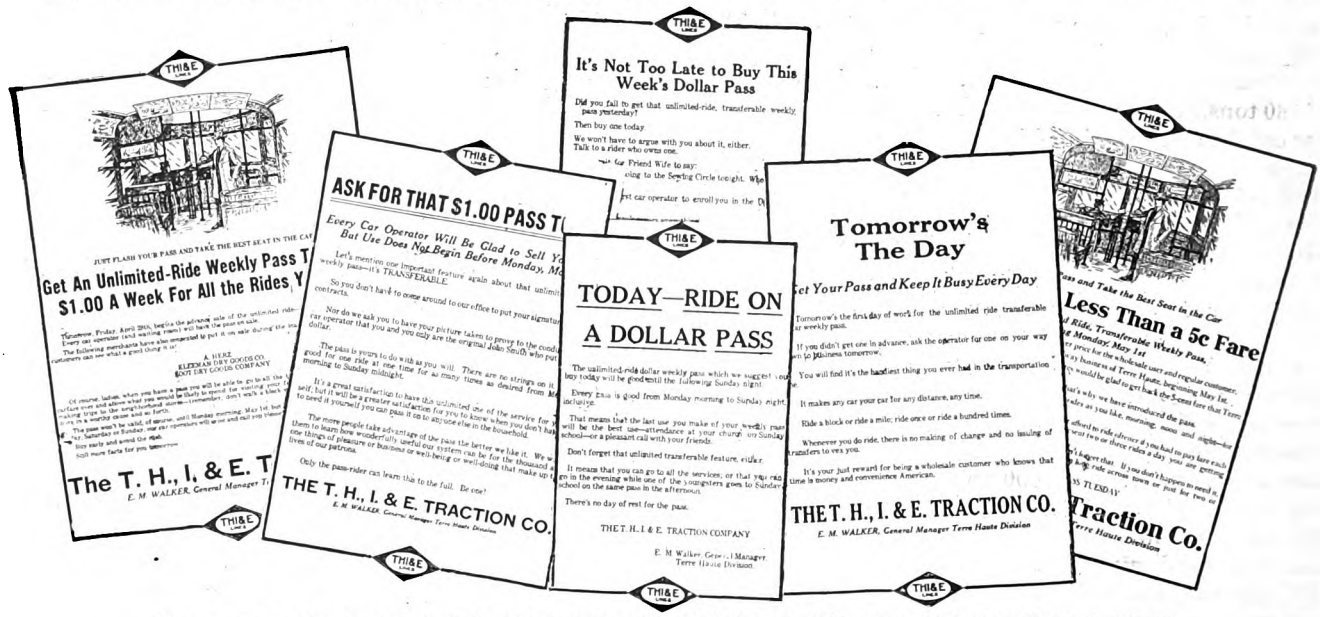
that an admirer had purchased for Mayor Davis Serial No. 1 of Pass No. 1; and there were also the preliminary car window placards setting forth the good news that one could "Ride 50 Times a Week for $1.00." First prize in publicity ideas, nevertheless, must go to Mr. Walker himself, whose quick wit resulted in impressing an elephant of the Gollmar Brothers' circus in town on May 1 to act as a "sandwich-man." As all Terre Haute was lined up to see the circus parade with its Ponderous, Pachydermatous Performers, the good inhabitants were advised to "Be Thrifty—Own a Dollar Weekly Pass—It's Transferable." According to the register records of May 1, the advice was taken to heart, for the pass-holders kept their passes busy enough to average about five "origin-to-destination" rides on Circus Day!

Terre Haute is the center of a coal mining district, harboring some 6,000 miners who have been idle since April 1 and are therefore not prospects for riding on a pass. Their idleness in turn depresses other activities in Terre Haute, which go up or down as the coal business moves. This condition in itself, it is estimated, prevents the sale of at least 1,500 passes a week, assuming that only 25 per cent of the miners took advantage of the pass.

Aside from this temporary obstacle to maximum pass sales is the permanent one that a single trip costs only the low and convenient fare of 5 cents, thus minimizing the argument of convenience and change abolition. The pass also costs $1, which, in this case, means twenty cash fares (there are no ticket rates) compared with the situation in Fort Wayne and Kenosha, where the pass equals sixteen ticket fares; in Racine and New Brighton (Beaver Valley), where it equals seventeen usual fares, and in Youngstown, where it equals but fifteen ticket fares. While this relatively higher price tends to cut down sales, it also comes closer to assuring a profit on the majority of purchasers.

In spite of these handicaps, the sales for the first week were 1,493 out of a total city revenue of $12,651, or 11.8 per cent. This compares with 818 $1 passes in Racine's first week against a then fare of 6 cents and 5½ cents workman's limited-hour fare at a time when Racine was prosperous and had about 60,000 people—or but 6,000 less than Terre Haute. Racine is too close to Chicago and Milwaukee to be as good a shopping town as Terre Haute, but on the other hand it has a greater diversity of high-grade industries. Present Racine sales are on the order of 2,200 a week, showing that the public takes to this style of transportation more and more as times goes on.

The Terre Haute, Indianapolis & Eastern Traction Company is registering the presentation of passes on an overhead register, while cash fares are dropped in a counting-type farebox. The figures for the first week show a total of 59,279 registrations, the equivalent of forty rides per pass a week. After making 25 per cent allowance for what would otherwise be transfers, the net "origin-to-destination" rides per week proved to be 30. This figure was doubtless swollen by the advent of the circus, May 1. From general experience with passes in cities of similar size and area, it may be estimated that with a greater number of sales the average daily rides should be four, except for Sundays and holidays, when the average falls to two and one-half.



SPECIMENS OF NEWSPAPER ADVERTISING WHICH SUPPLEMENTED AND FOLLOWED LIBERAL NEWS ARTICLES

While it is too soon to expect any heavy decline in the forty to fifty competitive jitneys, a number of partial

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THE BACK OF THIS PASS FEATURES THE COMPANY'S GOODS—THE SAFETY CAR

or complete jitney customers have stated that the weekly pass means an end of jitney riding for them. Perhaps the most interesting incident in this connection was the boldness of one of the platform men who deliberately planted himself at Seventh Street and Wabash Avenue, and sold twenty-six passes right under the noses of the discomforted jitney operators!

Mr. Walker's enthusiasm for the safety car is reflected in the style of pass adopted. The back carries a half-tone engraving of a flock of the famous "green bugs" of Terre Haute. To encourage the sense of salesmanship in his men, he has arranged to put them on a commission basis at the rate of 2 cents per pass sold. The range of sales ability among platform men is revealed by the difference in sales, the top man selling 60 and the bottom man 5 passes. During the first week there were also three prizes of $3, $2 and $1.

New Locomotives for Metropolitan (London) Railway

TWENTY electric locomotives of new design are being supplied to the Metropolitan Railway for service between Aldgate and Baker streets, London, on the Metropolitan Railway. These are replacing steam locomotives. They haul a trailing load of 180 tons, six of the standard passenger coaches, and are designed for high-speed service. The energy consumption guaranteed by the contractors, the Metropolitan-Vickers Company, Ltd., was 60 watt-hours per ton-mile.

The locomotives are of the 0-4-4-0 type, comprising two trucks, each carrying two 300-hp. self-ventilated motors driving the axles through single reduction gearing. The total weight is approximately 57½ tons.

The electric power supply for these locomotives is at 500 to 600 volts on a third rail, with an insulated negative return rail laid in the center of the track. The running rails are not used for the return circuit as they are employed in connection with a signaling system. There are four positive and two negative collecting shoes on the locomotive, the positive shoes being in duplicate, one set of shoes being fixed on each side. The negative shoes are on the center line. Collecting shoes are also carried by some of the coaches and are connected to a power bus line running through the train. This is to permit the train to pass readily over gaps in the collecting rail.

DATA FOR NEW METROPOLITAN RAILWAY 1,200-HP. ELECTRIC LOCOMOTIVE

Length over buffers	39 ft. 6 in.
Length over body	35 ft.
Width over body	8 ft.
Height from rails	12 ft. 4½ in.
Center to center of trucks	20 ft. 3 in.
Wheelbase of motor truck	9 ft. 3 in.
Total wheelbase	29 ft. 6 in.
Diameter of running wheels	43½ in.
Gear ratio	23 to 57

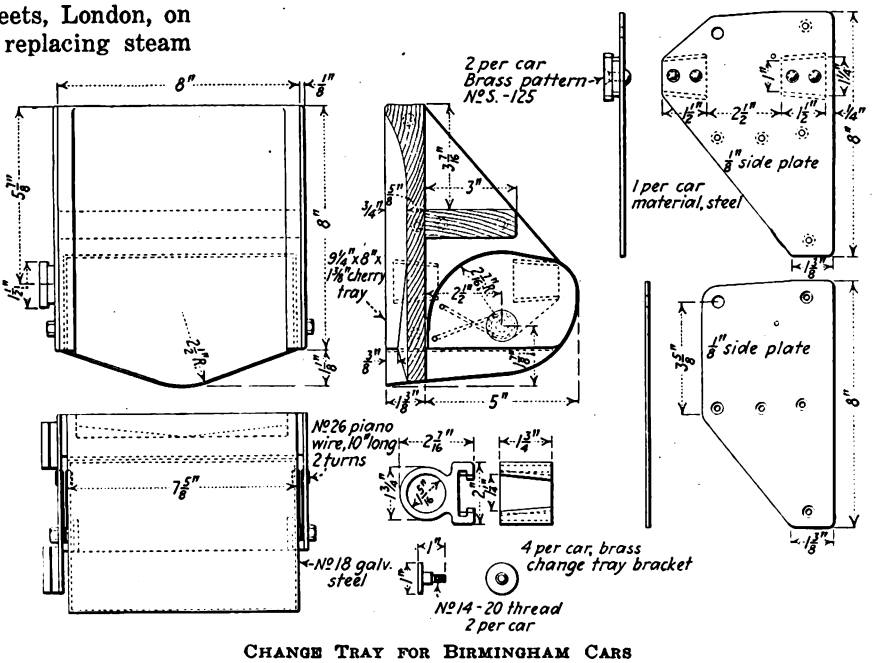
Some of the dimensions of the locomotive are given in the accompanying table.

These locomotives are being supplied to the specifications of Charles Jones, mechanical and electrical engineer of the railway. The details of the locomotive are covered in recent articles in *Engineering*, London.

Change Tray in Birmingham

A SIMPLE change tray has been installed on a number of the one-man cars of the Birmingham Railway Light & Power Company of Birmingham, Ala. This company charges an 8-cent cash fare, sells tickets at a reduced rate, and issues transfers, and the tray has been found a great convenience to both operator and passengers. As shown in accompanying illustration the tray is mounted on the usual bracket that supports the fare box and consists of a dished-tray made out of 1¼-in. cherry board and about 7 in. x 8 in. in size. This tray is supported on either side by thin steel plates, which project about ½ in. above the cherry board. The tray is swiveled on the post so that it can be revolved as desired by the operator. It is also arranged so that the operator can tip it toward himself, when the tickets and cash which may be on the tray will run into his hand.

The tray allows passengers when boarding the car to deposit their fares and transfers on the tray and take their seats. It also provides a very satisfactory means for the operator to make change. By it also the fare is deposited in plain view of the operator, who thus has an opportunity to know that the correct fare has been paid. An overhead double fare register is used.



CHANGE TRAY FOR BIRMINGHAM CARS

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Electric Railway Publicity

Devoted to How to Tell the Story

Hospitality Month at Elmira

THE success of the Courtesy Campaign conducted by the Fifth Avenue Coach Company, New York City, and of the Civility Campaign of the Northern Ohio Traction & Light Company, Akron, Ohio, led F. H. Hill, vice-president and general manager of the Elmira Water, Light & Railroad Company, Elmira, N. Y., to consider holding a similar campaign on his property.

Mr. Hill's company subscribes to Babson's reports, and while the proposed Courtesy Campaign was being considered Roger W. Babson's letter on hospitality was received. This letter gave Mr. Hill the inspiration to go further than a Courtesy or Civility Campaign and to have a Hospitality Month.

Accordingly the period from Feb. 15 to March 15 was designated as Hospitality Month and plans were made for an intensive campaign among the employees of the company.

The first step was a letter from Mr. Hill announcing the campaign and the reasons for it. This letter, mailed to each employee's home, read as follows:

Feb. 3, 1922.

Dear Fellow Worker:

All of us depend upon the public, whom we supply with electric, gas or street car service, for our living.

Most of us come in contact with the public to some extent either face to face or over the telephone. The public judges any concern largely by the action of its employees, and the public must think well of it before any concern can be prosperous.

On our cars, for instance, if we are cheerful and courteous and help render good, safe service, the public will feel at home and will be pleased. A pleased public means that more street car rides, or electricity or gas, will be sold; this makes for the prosperity of the company, in which we all share.

This spirit of hospitality is indispensable to the prosperity not merely of our company or our city but of the entire nation.

We wish to do our part in promoting hospitality by holding a "Hospitality Month" beginning Feb. 15, believing that all of us will become so accustomed to cheerful and courteous thoughts and words and acts during this month that hospitality will become a habit.

During the month we will have a number of employees' meetings at Roricks Glen, at which there will be talks by interesting speakers, followed by entertainment. Watch the bulletin boards for further announcements.

Let us all co-operate so that we may have a real "Hospitality Month."

Sincerely yours,
F. H. HILL, Vice-president.

Then a series of four meetings for employees and their families was planned, to be held in the company's dancing pavilion in the park operated in connection with the street railway system.

Just before the first of these meetings a special announcement of the meeting was mailed to each employee, together with a booklet containing extracts from Mr. Babson's letter on hospitality.

The first meeting was held on Feb. 15, with Mr. Hill presiding. The speaker of the evening was John MacIntyre of the Society for Electrical Development. Another meeting was held Feb. 28, with H. B. Harmer,

One Thought a Day About Our Business

Number 8 *Feb. 22, 1922*

Passing the Buck

A favorite sport these days is that known as "Passing the Buck." With some of us the game becomes a habit and we attempt to dodge duties and responsibilities by passing them on to someone else.

In a large organization like ours each one of us, of necessity, has certain defined duties and responsibilities, which if properly attended to are enough to keep us busy. However, if we do not take an active interest in the company and its customers, we are simply job holders and neither the company nor ourselves will make the best progress.

Every day our customers or others outside the company ask for information concerning the company and its service which you are not always in position to give. Do not give an evasive or inaccurate reply or say something to the effect "you will have to ask the office." Instead tell the questioner that you will see to it that he secures the information he desires. If it is necessary for the inquirer to discuss the matter with some one at the office give specific information as to whom he should see and where.

Nothing is more exasperating than to be passed from one person or department to another in an effort to secure information. Remember that few people have any conception of the size and scope of our organization and true hospitality demands that we show an active personal interest in seeing that no one has just cause to complain of our methods and service.

H. E. GOUGH,
Assistant to General Manager.

NOTE—A new thought prepared by an employee is distributed each day during Hospitality Month to all employees
Please save this and put it in the folder provided.
ELMIRA WATER, LIGHT & R. R. CO., Elmira, N. Y.

Service

Service is a rather broad term. To comprehend its fullest significance when applied to the Public Utilities Organization would afford some student of thought a study worth while. We, as members of such a body, may consider "service" from a twofold point of view. First: Our Service to the Company; Second: Our Service to the Public.

Considering the first: Regardless of our relative position in the cog-wheel of business, we all play an important part in the performance of our respective duties. To attain a maximum degree of efficiency means that every one must conscientiously render service which is as near 100 per cent perfect as human beings can make it. While the business may be divided into functional units such as power house, traction, gas, electric light and office departments, these various components are so dependent upon one another that co-operation to the fullest extent makes for the high grade of service, which it is our duty to render.

Considering the second: Who may judge the character and quality of our service better than our customers? Truly, they make it possible for us to do business. We owe our very existence to them. All of us know just what constitutes service from the viewpoint of our customers.

It seems that such vital characteristics as loyalty, co-operation, hospitality, sincerity and courtesy should be manifested in every word and deed not only in our organization but also in our relationship to our customers. Service which is cheerful and ever increasing in its quality insures mutual satisfaction of a lasting nature to each and every one concerned.

LESLIE E. MILLS,
Service Department.

Hospitality

The dictionary gives the meaning of hospitality as "an act of receiving or entertaining guests." If we take this meaning as it stands and practice it, we will only be showing hospitality to those who come IN to see us, and not to those we go OUT to see. We must remember that kindness can be shown to everyone, no matter who. It doesn't have to be shown by an entertainment, just one pleasant word will do the work.

There are a number of persons, it is true, who will not accept a little word of hospitality, and who will give no word of kindness in return. It is up to us to show these people how to take it, and how to pass it on.

We cannot expect hospitality if we ourselves fail to show it to others.

MAE MOLTER,
Stenographer, Car Barns.

EXAMPLES OF "DAILY THOUGHTS" SUBMITTED BY THE ELMIRA COMPANY'S EMPLOYEES

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safety engineer of the Philadelphia Electric Company, as the speaker. On March 9 the third meeting was held, W. H. Boyce, general manager of the Beaver Valley Traction Company, New Brighton, Pa., being the speaker. At each of these meetings Mr. Hill also gave a short talk on the reasons for the hospitality movement, and in addition to the talks there were entertainment of various kinds and refreshments.

For the fourth meeting no speaker was "imported," but A. C. Jordan, general electrical superintendent of the company, and Mr. Hill gave short talks on the experiences and results of Hospitality Month. A safety moving picture was shown in connection with a trial of two moving picture machines.

No special efforts were made to reach the public direct during the campaign, except that announcement of Hospitality Month and the employees' meetings was made in the newspapers and car cards were inserted in the street cars.

For each day during Hospitality Month there was printed and distributed a series of short articles called "One Thought a Day About Our Business." The first of these "thoughts" was written by Mr. Hill and each succeeding one was written by a different employee on a subject of interest to all employees. These "thoughts" created much interest among the employees and they looked forward each day to receiving the "Daily Thought."

During Hospitality Month a card was given to each of the company's customers by the meter readers, asking for suggestions or criticisms regarding the service. Many of these cards came back with suggestions or complaints and quite a few stated that the service was very satisfactory.

The main result of Hospitality Month among the employees was a greatly increased effort on the part of all departments to give good service to the customers of the company. The company meetings also resulted in getting the employees of the various departments better acquainted with each other. The Elmira Water, Light & Railroad Company is a combination utility, supplying electric, gas and street railway service. Before Hospitality Month the employees of one department had very little in common with those of another, but a splendid spirit of co-operation has been developed.

While one month was set aside as Hospitality Month and an intensive effort made to interest employees in hospitality, the idea will be kept constantly before the employees.

Likes Complaints—At Headquarters

THE only advantage in a complaining public, so feels the Portland Railway, Light & Power Company, Portland, Ore., lies in the public complaining directly to headquarters. The company is therefore appealing not only to those who have complaints but also to those who have suggestions to offer or constructive criticism to give by inclosing stuffers in all letters.

The inclosure creates good will by showing the public that the company sincerely wishes persons to call the office at any time. The company "is always striving to give adequate and dependable service," the slip states. The telephone number of the superintendent of city line transportation is included on the advertisement, so that all complaints may be made directly to the office.

Artistic Posters and a Fairy Tale Advertise London Underground

A LONDON public, jaded by much advertising, is being directed in an artistic manner to ride on the lines of the Underground Electric Railways and the London General Omnibus Company. The traffic advertising agent of these two companies, in addition to unusually well-designed posters, has issued a book daintily illustrated with pen and ink drawings. The story is of the fairies of the world underneath London, who have had to move on and on in front of the oncoming underground railways. Of course, the verses state that buses of the London General Omnibus Company are routed to the edge of the wood into which the fairies have retired at the present time. The posters used during the past few months are a departure from the customary type used for advertising services of railway and bus companies. The accompanying illustrations show how these London companies convince a prospective passenger to take a ride.

THE ART DISPLAYED IN THESE LONDON UNDERGROUND POSTERS IS ONE OF THE CHIEF SALES APPEALS

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C. E. R. A. Engineers Meet in Louisville and Cleveland

Determination Expressed at Eastern Section Conference to Standardize Wheel Specifications—Safety Car Maintenance Figures and Report on Wheel Welding and Power Saving Devices Presented—Other Common Problems Discussed

DURING the last week of April two of the sectional divisions of the Engineering Council, Central Electric Railway Association, had their meetings, the southern section convening in Louisville, Ky., on April 26 and the eastern section on the following day in Cleveland. Each meeting was well attended by the track and equipment men of that section and several of the same questions were actively discussed by both divisions. Following the session in Louisville, those present were conducted by F. H. Miller, vice-president Louisville Railway, on an inspection tour of the company's shops and power plant. Likewise the Cleveland group spent part of their afternoon in the Harvard shops of the Cleveland Railway.

One of the most pertinent topics that received full discussion at the Louisville meeting was the advisability of using flexible in preference to rigid conduit for car wiring. It was the consensus of opinion that circular loom when joined with non-metallic junction boxes is safer than metal conduit. Metal conduit does not confine the fire when a short-circuit occurs because it is completely burned through. Several delegates told of having one-man cars on which circular loom had been used entirely, and one member reported that he was using flexible conduit on all light-weight cars. Because of the insurance requirements, which place a higher rate on cars equipped with flexible conduit, it was thought that the problem was worthy of further study in order to convince the insurance people that no extra hazards were incurred. All agreed that it was a question of economy, for if conduit of the flexible type serves the purpose as well as that of the rigid type, there is no reason why the cheaper material should not be used. In order to collect actual operating data on the safety, cost and life of flexible conduit, the question was referred to a special committee.

Experience Exchanged on Lightning Protection

Experiences were exchanged on the question of the efficiency of various types of lightning arresters. All agreed that the effectiveness of the electrolytic type of arrester is very high, although some believed that the protection given by this type does not justify its cost of inspection and maintenance. To see whether or not the electrolytic arrester is operative, it must be inspected after every storm, a task that entails considerable expense and inconvenience when the arresters are not located in an accessible location. There is also the disadvantage that protection is not complete during a storm, for the fuse may have been blown during the early part of the storm. This leaves the equipment unprotected without knowledge of that fact, as the blown fuse is not detected until inspection after the storm. It was related that on one property where the cars were protected by electrolytic arresters an armature had never been lost from lightning. For this reason it was believed that the maintenance and inspection costs were warranted by the results. As to the location of arresters, several companies are now moving them from the roof to the underside of the car to make inspection easier and to eliminate damage from limbs of trees.

As to protection of the system in general from lightning, Adolph Schlesinger said that the Indianapolis, Terre Haute & Eastern Traction Company has had excellent results from the practice of placing protective devices in the power houses, substations and on cars, only. The company has so many miles of interurban road that it was found impossible after each storm adequately to maintain the arresters located on the poles. Consequently they have been removed. He did not, however, recommend this practice for city service, where the inspection problem is much simpler.

Relation of Ballast to Signals

Because of the trouble experienced with automatic block signals when cinder ballast has been used, L. A. Mitchell, Union Traction Company of Indiana, told the practice of this company in this respect. He said that all cinders from the company's power plant are used for track ballast and he believes it is an excellent material for tracks having wheel loads within the range of those for which electric railway equipment is designed. However, it has been found that when the cinders come in contact with the base of the rail, the working of the signals is seriously affected. The theory, of course, is that no ballast of any kind should be in contact with the rail. Current leakage through cinder ballast in dry weather is not much different from that through gravel or stone ballast. The effect of such leakage is most noticeable during rainy weather when the conductivity of the cinders is increased due to the porous structure. This means that close care must be exercised in trimming ballast to avoid contact with the rail.

It was brought out also that there are other reasons why the ballast should be kept away from the rail. Cinder ballast has a tendency to corrode the rail, and the creeping in of the powdered cinders between the rail and the tie causes the tie fiber to be mechanically destroyed due to the abrasive action.

Although on one road it was stated that no less trouble with block signals was experienced when special care had been taken to trim the ballast, all agreed that the question called for co-operation between the track and signal maintainers because there is a limit to which the voltage can be raised. Mr. Mitchell added that keeping up insulated joints had aided materially in eliminating signal troubles on the property with which he was connected.

Nearly all the equipment men present were using or had given a trial to the Frary bearing metal. Nearly all had found that journal bearings of this metal gave an unusually large mileage, but their experience with it for axles and motor bearings had not been as successful. In several cases it was reported that the metal had broken and crumbled when used in that service. Consequently it was agreed that a tin base metal gave better service for motor and axle bearings while the Frary metal was good for journal bearings.

In connection with the trouble from excessive side wear of brushes and brush-holders, it was pointed out that the manufacturers are bringing out brush-holders with renewable carbon ways to make necessary the replacement of only the wearing surfaces. The equipment men claimed that the brush-holders were the least of their worries in this problem.

Report of Eastern Section Meeting

The principal constructive work of the eastern section consisted of the committee reports on welding flanges, power-saving devices, wheel standardization and standardization of trolley pole lengths. The report of the committee on welding flanges on rolled steel wheels, of which R. Moses is chairman, based its report on information secured from fifteen railways, one wheel manufacturer and one manufacturer of welding apparatus. Of the fifteen railways, eight had been doing flange welding for a period of from one to three years and seven had never attempted welding of wheel flanges. These seven properties stated that they do not consider it a safe and economical practice. They make this assertion, however, it was said, without having made any investigations or tests. The eight properties which have engaged in flange welding stated that they have not had a case of a welded flange breaking.

The wheel manufacturer furnished the following information to the committee:

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In order to weld the metal to the flange of the wheel both the added metal and the portion of the flange with which it comes in contact must be heated to a temperature of fusion. As soon as the source of heat is removed, this highly heated metal is rapidly cooled by the conduction of the heat to the cooler portions of the wheel. This heat abstraction is so rapid that it practically amounts to a quench. We would therefore expect the metal in this wheel, particularly in the neighborhood of the flange, to be in a highly strained condition as a result of this treatment. Moreover, the fused metal will have a poor structure due to the fact that no work has been done on it since it was in the molten condition.

In addition to this, the making of a weld mechanically perfect by the arc process is a difficult job and requires expert labor. Inexperienced operators would probably leave portions where the weld is not even mechanically perfect.

We believe that for city cars where the service is not excessive and where the girder type of rail is used that the damage from broken flanges may not cause serious trouble. However, for interurban service where the cars run at high speed and where the T-rail is used, the danger from derailment with a broken flange is greatly increased. There is no doubt in our minds that the welded flange would not be suitable for interurban service.

The manufacturer of welding apparatus made this statement to the committee:

After making exhaustive tests we find the thermal disturbance immediately below the line of welding extends to approximately ⅛ in. This zone has all the attributes of a heat-treated steel resulting in a much tougher metal than is found in the usual rolled steel wheel. Under these conditions we cannot help but feel that it is perfectly safe to build up flanges on steel wheels and the fact that several railways have been doing this with entire success from a period of one to three years would tend to bear us out in this assertion.

The committee found that the welding process employing a dynamo or motor-generator outfit with an automatic feed is by far superior to other types for flange welding. Its speed, uniformity of arc and economy account for its superiority.

The average cost of welding a flange on a 26-in. wheel with a dynamo or motor-generator outfit equipped with an automatic feed, as found by the committee, is $2.95. The average cost by hand welding with the same type of outfit, as reported from six properties, is $4.27.

The committee recommended to the section the practice of welding flanges on rolled steel wheels as a safe and economical one for city cars when the work is performed in the proper manner. As to the safety of this practice, the committee failed to find any instance where a flange had broken after it had been electrically welded. The committee contended that welding wheels is an economical practice when a flange can be welded to the proper contour at a cost not exceeding $4. Approximately 40,000 miles additional wear is obtained by saving a wheel from being turned.

The committee also emphasized the fact that wonderful strides in wheel welding practice have been made and that the council members assist in perfecting the practice. It was its belief also that when the art of flange welding is perfected, the electric railway industry will have secured something that will mean a big saving in operating expenses.

Active Work on Wheel Standardization

A. B. Creelman, master mechanic Youngstown (Ohio) Municipal Railway, presented a progress report for the committee on wheel standardization. He had received nineteen answers to thirty-three questionnaires sent out to the member companies of the section. The answers showed that there were seven different specifications for 37-in. wheels, nine for 36-in., fourteen for 34-in., fourteen for 33-in., one for 30-in., and one for 28-in. Mr. Creelman stated that altogether the electric railways of the country are using 1,100 types of wheels having different contours and hub projections. After sufficient data are accumlated and a thorough study has been made, the section expressed its eagerness to bring about an early reduction in the number of sizes and types. For this purpose the manufacturers also are ready to co-operate by giving the benefit of their research and experience. Should this standardization be brought about, Mr. Creelman stated, it would mean an approximate reduction in the cost of wheels of $5 apiece. He added that the steam roads had gone through this same situation and successfully solved the problem by reducing 2,600 different types of wheels to the ten standards now in use. The subject is to be continued and reported on at the November meeting of the section.

G. H. Kelsay, superintendent of power and equipment, Cleveland, Southwestern & Columbus Railway, presented the report of the committee on power-saving devices, which consisted of a symposium of the results obtained on a large number of electric railways in the United States. The records of some of these installations show interesting economies.

Supplementing this report, P. J. Wood, Buffalo & Lake Erie Traction Company, said that his company had effected a 10 per cent average saving in power, measured at the switchboard, by the use of kilowatt-hour meters and that the brake-shoe cost per 1,000 car-miles had been reduced from $1.63 to $1.17. Based on seven months of operation, the cost of the meters and their installation, together with all other expense connected with their use, will be paid for in a year by the decreased energy consumption. The installation of car inspection dial meters has also made possible an improvement in inspection and maintenance work through placing these on a kilowatt-hour instead of a mileage basis.

H. W. Witherspoon said that on the Stark Electric Railway car maintenance had been reduced 18 to 20 per cent since the property began checking operation by the use of energy meters on the cars, and that in more than two years of their use, the energy consumption had been reduced from 6.6 to 4.69 kw.-hr. per car-mile. He also stated that the introduction of car meters had been an important factor leading to radical changes in the company's generating, transmission and distribution system, the revamping of which had netted substantial savings. Mr. Witherspoon also gave figures showing the reduction in car failure, brakeshoe wear, controller maintenance, etc.

Company	Saving
Philadelphia Rapid Transit	20 cents net per car-day after deducting operating and overhead charges in energy and using fuel cost only. 5 cents per car-day in carhouse labor using fuel cost only.
Cincinnati Traction Company	$7.90 per car per month in energy.
Illinois Traction System	Approximately 0.25 kw.-hr. per car-mile on safety cars over a year's period.
Seattle Municipal Railway	0.5 kw.-hr. per car-mile at d.c. board.
Union Traction Company of Indiana	0.5 kw.-hr. per car-mile at d.c. board.
San Diego (Cal.) Electric Railway	$110 per car per year resulting from a 15.41 per cent reduction in energy.
Washington-Virginia Railway	13.2 per cent in energy. 14.7 per cent maximum demand. 104 per cent on investment in three months.
South Covington & Cincinnati Street Ry.	Total energy consumption held practically at a level for five years even though twenty-five double-truck replaced twenty-five single-truck cars and passengers per car-mile had increased 30 per cent.

Trolley Pole Lengths

Terence Scullin, master mechanic Cleveland Railway, presented the committee report on the standardization of trolley pole length. The committee recommended a 13.5-ft. trolley pole as standard, claiming that according to its investigations this length ought to meet any requirement. A pole of this length mounted on a car about 12 ft. high rises to an angle of about 45 deg. when making contact with a trolley wire at a railroad crossing, the minimum height for which is 22 ft. For the standard height of trolley wire of 18 ft. the normal pole angle is 25 deg. The report was accepted by the section.

As was agreed at the November meeting of the eastern section, cost figures on the maintenance of safety cars were kept by several of the railways. The two sets of data presented were as follows:

MAINTENANCE COST PER CAR-MILE—SAFETY CARS

Account and Item	Youngstown Municipal Ry. Cents	N. O. T. & L. Cents
30 and 33 Body and truck repairs	0.3	0.509
70 Inspection and cleaning	0.1	0.466
80 Damages	0.0006	0.001
	0.4006	0.976

The figures obtained on the Youngstown Municipal Railway are based on

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the operation of twenty-four cars, twelve of which are eighteen months old and twelve four months old. The cars are inspected every five days and cleaned every two days. The results for the Northern Ohio Traction & Light Company were obtained from 55,800 car-miles operated by the safety cars in Massillon. Both sets of figures are for one month of operation. Mr. Creelman explained that the accidents with safety cars has decreased appreciably during the second year of their operation largely because all the men had then become accustomed to their use. In answer to the contention that safety-car collision accidents are still very high, he said that the cost and time required for repairing safety cars are much less than those for the heavier type of equipment. As to the cost of painting safety cars, Mr. See said that a car could be varnished outside and cleaned inside for $25. Several others gave approximately the same cost.

As in the southern section, the advisability of using flexible conduit was discussed in the eastern group. The majority had obtained favorable service from flexible conduit, while one member reported that he had noted excessive deterioration in material of this kind installed on cars in service since December, 1918. Its inadequate protection to the wires had also caused several fires. On the other hand it was reported that installations of "duraduct" and "flexiduct" had been in service successfully from four to nine years.

W. R. Goodnight, master mechanic Cleveland, Southwestern & Columbus Railway, was the only member who had made any concrete observations as to the proper length of trolley ear for any size of wire. After experimenting for two years with trolley ears varying in length from 8 to 15 in. he had decided on the 15-in. ear for No. 000 grooved wire.

A question that has become pertinent in some cities is that of supporting trolley span wires from buildings along the thoroughfare, thus eliminating the necessity for poles. In Columbus, Ohio, it was stated, the building owners insist that the span wires be attached to their structures rather than to poles. In some cities, Terre Haute in particular, city ordinances have ordered the removal of poles for esthetic and lighting considerations. As far as was known, no electrolytic action on steel building structures had been experienced due to faulty insulation. It is more difficult, in spanning between buildings, to construct an overhead of neat appearance because of the varying span length and height of attachments.

C. E. R. A. Cruise Selling Fast

THE committee on arrangements for the summer meeting and cruise of the Central Electric Railway Association reports that the sales of tickets thus far this year are 50 per cent ahead of the sales at the same time last year. John Benham, secretary of the committee, suggests that this should be borne in mind by those who desire choice accommodations, for assignments of space are made in the order in which applications are received.

The cruise is to start from Chicago on Sunday, June 25, and end at that city on Friday, June 30. Stops en route will be made at Detroit, Toledo and Cleveland for the purpose of picking up additional passengers, though the great majority of delegates will make the entire round trip. The business meetings of the association will be held on Tuesday afternoon, June 27, while the boat plies between Toledo and Cleveland; on Wednesday afternoon after the boat passes Port Huron and is out in Lake Huron; and on Thursday afternoon, after the boat leaves Traverse City and heads out into Lake Michigan from Grand Traverse Bay. The program of the business sessions has not yet been announced.

Traffic Congestion*

The Causes for Traffic Congestion Are Analyzed and Suggestions of Means for Its Reduction Are Made

BY WILLIAM W. HOLDEN
Superintendent of Transportation,
San Antonio Public Service Company

ALL street railway men know that irregularity in schedule causes more dissatisfaction with service than any other factor in the business. Schedules are planned to take care of transportation requirements, but when the plans miscarry, the service is inadequate. Between 50 and 95 per cent and probably nearer 95 per cent of the irregularities in schedule are caused by traffic congestion in the downtown districts. Accidents, of course, are invariably a result of traffic congestion. For the first three months of this year slightly more than 30 per cent of all accidents of the San Antonio Public Service Company were within a circle of ¼ mile radius comprising the downtown loop. While it is hard to express the cost of traffic congestion in dollars and cents, it is apparently also hard to exaggerate the value of measures to reduce traffic congestion.

No general remedy can be recommended or applied as a cure-all for traffic troubles. The stop watch and counter must be called into play and each separate item of time expenditure measured. The time of stopping, the time of unloading, the time of loading, the time for throwing switches, the time for waiting on other traffic and the time of accelerating must all be measured. The point or points of greatest congestion are the places to analyze. A chain is only as strong as its weakest link and traffic movement is only as fast as the slowest point.

The time of acceleration and the time of braking are both fixed at a minimum by the friction between rail and wheels. On dry rail the rate averages about 2 m.p.h.p.s. This may be exceeded, of course, and cannot always be obtained in traffic but it may be accepted as an average. If cars are equipped to get the maximum braking possible and motored to get the maximum acceleration possible, we can say that each stop will average to take approximately sixteen seconds for braking and acceleration.

Where passengers leave the car by a separate door from the entrance, unloading seldom has any effect on the limitations of traffic congestion, as it is usually in the afternoon peak that the greatest difficulty is encountered in getting cars through congestion, and at that time the traffic is loading in the congested district. However, where one entrance is used for both entrance and exit, unloading adds to the delay. Stop-switch checks have shown that the time per passenger for unloading will average about 1.85 seconds in a single stream. With larger numbers of passengers unloading than experienced in the check made, this might be reduced to 1.75 seconds per passenger. If only a few passengers unload, this item will not be of sufficient importance to pay for a change of design of cars already in service, but the use of double doors should be considered when new equipment is ordered.

We can assume that the minimum length of time to load where no fares are collected at entrance would be the same as that for unloading. With this assumption, any additional time for loading would be chargeable to fare collection and would represent what could be saved in part or whole by a method of fare collection where passengers pay as they enter inbound and pay as they leave outbound, or by the use of men making change on the ground. Fare collectors using an additional entrance could save a maximum of one-half the time required for loading after allowing for unloading at the extra entrance. To illustrate these points, our stop-watch observations show a case of fifteen passengers boarding a double-opening car and five passengers leaving. The passengers boarding consume an average of 2.25 seconds. Of this, 1.75 seconds, or 0.5 second per passenger, or 7.5 seconds per stop, is the maximum that could be saved by change makers or the pay-enter inbound and pay-leave outbound method of collection. If front-entrance collectors were used, the maximum saving per stop would be ½ [(2.25 x 15)-(1.75 x 5)]=12.5 seconds.

Where a single-opening car is used, only the saving that could be made by the change makers or the pay-enter

*Abstract of paper presented before the Street & Interurban Railway Section of the Southwestern Electrical & Gas Association, San Antonio, Tex., May 3-5, 1922.

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inbound and pay-leave outbound system would be available.

Odd-cent fares tend to increase the amount of time consumed in loading passengers on the pay-enter plan. This can be offset to some extent by the use of metal fares. In the observations reported, the fare collected is 8 cents, of which approximately 45 per cent of the paid fares were metal tokens.

The time for throwing switches will vary somewhat, due to the amount of traffic at an intersection. Stop-watch checks have shown that it will average about twenty-five seconds. Not only must each car that takes a branch-off throw the switch, but each car following on the through route must also throw it. This time can be reduced by switching through a hole in the platform floor and can be almost entirely eliminated by the use of electrically operated switches except for some slowing down of the car, mistakes in throwing and occasional failure to throw. Electrical switches have been installed in San Antonio in twenty out of twenty-three possible locations in the downtown section. They are especially effective in helping the one-man cars, as the operator does not have to leave his position and possibly neglect his fare collections. With two-man cars the motorman can frequently throw the switch while the conductor is engaged with the loading of passengers, so that no additional time or only part is consumed on these occasions.

Delays From Other Vehicles

The time of waiting on other traffic includes the time of waiting on other street cars and other vehicles. There will always be some mutual interference, and the amount of this will be determined by the width of the street combined with the number of vehicles passing and modified by the amount and quality of traffic regulations.

An average double-track line will require 18 ft. of roadway for street cars, and the average passenger automobile is 6 ft. wide. Hence, with a parking allowance of 1 ft. from the curb, a street should be 32 ft. wide to permit parking or to allow a double line of traffic without parking. It should be 46 ft. wide to allow parking and a double line of traffic, or no parking and a triple line of traffic, etc.

There are three items of traffic regulation that affect the movement of traffic in the congested centers, namely, parking regulations, movement of vehicles past standing street cars, and regulation of left-hand turns. Parking by the side of loading places cuts down the use of the street for traffic so that for streets of less than 50-ft. width between curbs, the street is no better than an 18-ft. street. Parking between stops cuts down the available free running space for vehicles, but even where parking is permitted between stops the delays occur chiefly at intersections. The delay between stops is occasioned by vehicles pulling into or pulling out of their parking berths. This frequently blocks traffic as far back as the intersection and for periods as long as a minute or even more. Parking time is usually limited to ten, twenty, or thirty minutes on such streets. Instead of helping traffic, this really retards traffic because it is due to the pulling in or out of the parking berths that the greatest delay occurs. From a traffic standpoint, if parking is to be permitted at all, it would be better not to fix a time limit. Parking between stops is also very expensive in accidents. By far the most frequent of all accidents with vehicles are caused by parked vehicles being pulled by their drivers out from the curb without looking behind them or without signaling to traffic to their rear at all, or at least in time to be of any value.

A great many cities have regulations that vehicles must not pass street cars while stopped for passenger interchange. This is required for safety and is an essential precaution. However, it increases the delays in traffic movement, and these delays can be greatly cut down by the use of safety zones or loading platforms and permitting vehicles to pass where such precautions are taken. Safety zones should be at least 3 ft. wide and loading platforms should be a little wider. Safety zones are more satisfactory in comparatively narrow streets, say from 38 ft. to 50 ft., because they are easily movable to accommodate special traffic conditions and add less to the congestion and liability to accidents with vehicles. Where streets are wider than, say, 50 ft., the platform furnishes a safer place for passengers, and the platform does not offer so great an obstacle to traffic.

Left-hand turns in congested centers are always a cause of additional delay. Stop-watch checks will show that one vehicle turning to the left required as much time as from four to five vehicles going straight through an intersection or turning to the right. Checks also show that where turning to the left is permitted, one out of six vehicles will make such a turn. These figures will show that eliminating left hand turns will add approximately 50 per cent to the traffic capacity of the street.

The value of any traffic regulations is completely dependent on the efficiency with which they are enforced. There are many devices for assisting the traffic police, and any of them that tend to make the traffic officers' signals better understood, will be of value. The street railway will find that they will profit by the generous use of signs to inform the public where cars stop and what cars stop at each corner. Traffic inspectors to assist the police and the crews are almost indispensable at the most congested corners.

Location of Loading Points

The location of loading points gives one of the greatest possible chances for increasing the traffic capacity of streets. Where there is a branch-off line from the principal street, cars may be loaded on the branch-off street. This will eliminate part of the time used for braking and all of the time used for loading, unloading and accelerating of those cars from the time consumed on the principal street.

Where an excessive number of passengers board the car at a ruling point of greatest congestion, an additional stopping place properly located to divide this number of passengers may increase the traffic capacity of the ruling point.

Double berthing will theoretically double the capacity of a stopping place. There is, however, some mutual interference so that it can never be actually doubled. Safety zones or platforms are almost essential to double berthing in order to keep car space cleared for the second car to reach its position, without having interference from other vehicles.

As said in the beginning, each case of traffic congestion must be analyzed for its possibilities for improvement. As long as tracks in operation can be made to carry more cars safely, more satisfaction in routing will result. The more concentrated the central district, the more people can go directly to their destination. When all the methods enumerated have been used or rejected after an examination of their possibilities, it is time to consider rerouting of lines and additional track capacity.

Vocational Training for Railway Employees*

On This Texas Property a Special Effort Is Made to Treat Each Applicant as an Individual

By C. J. Crampton

Superintendent of Safety and Efficiency, Dallas (Tex.) Railway

AN ADEQUATE system whereby railway trainmen may be taught their duties prior to actual employment involves knowledge of the work they will be called upon to do; knowledge of the proper instructional order in which these duties may be arranged progressively; ability to present these duties in lesson form in an interesting, forceful manner, and familiarity with the prospective trainman that insures him to be the right person for the job.

After qualification requirements have been satisfied, the job must be sold to the worker. Much labor turnover is due to misunderstanding or ignorance of the job before its duties are undertaken.

The systematic method of training workers involves a complete analysis of the job to be taught. The several duties must be broken up and rearranged in such order that their progression represents a connected series of steps in which elemental and fundamental information is first presented

*Abstract of paper presented before the Street & Interurban Railway Section of the Southwestern Electrical & Gas Association, San Antonio, Tex., May 3-6, 1922.

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as a basis for later practice. On the Dallas Railway property we first analyzed the duties that trainmen will be required to meet, and then arranged these in a graduated series. Then we selected a number of our most capable trainmen to teach the job. These men, called instructors, were then put through a training course in which the teaching order of the various parts of the work was developed, along with the psychological and educational factors that could be used most effectively in presenting the lessons. They were then given an instruction pamphlet, in which the operation of a street car is analyzed.

Instructors first become thoroughly acquainted with their students; learn enough about their past experience, family history, vocational and recreational interests, etc., to form a basis for building their lessons. In many cases an instructor finds after a brief contact with the student that he should seek other employment.

The student is first impressed with the necessity of a knowledge of the city. He then learns all streets over which the lines pass and, along with this, enough about the operation of a car to develop an interest in its mechanical construction and use.

The rules and practices peculiar to the company are mentioned whenever the occasion permits and these are always explained so that the student will know the reason for the practice. He is introduced to the supervisors, inspectors and company officials with whom he will work and no effort is spared to impress him with the friendly, helpful and co-operative spirit of the organization. Inspectors and supervisors become practically instructors so far as new men are concerned.

Usually from fifteen to twenty days are required to master the training program. After successfully completing the training period the student is employed on probation for three months and reports every two weeks to the superintendent of employment and training for a discussion of his work.

The ability of the instructor is graded by the success of his students, and a card catalog is kept in which the records of new men are checked under the instructor's name.

Every trainman is graded monthly and receives a report card indicating the basis of the merits, or demerits, he has received. There is keen rivalry among the men over their grades, and these grades are published every month in *Partners*, our house organ. At the end of the year a summary of grades is made and a special edition of *Partners* carries the pictures of those doing work of the highest grade, etc. The grading system gives a very good basis for promotion.

The trainmen having been selected, the next step is physical examination. This should include a careful examination of sight, hearing, nervous condition and all apparent existing ailments which might affect or render him unfit for work, or at some future time might develop detrimental defects.

The details of platform instruction will, of necessity, vary according to conditions and size of property. The applicant, having passed preliminary and physical examinations, is ready for detailed instruction. It is hardly wise to attempt to crowd too much on a student during his period of training, and it should not be attempted to force on him too much of the mechanical make-up of the street car.

While the student is under the platform instructor, the chief instructor should make frequent trips with him to offer encouragement and suggestions, making the student feel at ease and that a personal interest is taken in his welfare. He should also at this time as far as possible explain to the student the rules and why the rules are in effect. The principal thought should be to have the student learn the proper handling of the car and passengers from an accident standpoint, with courtesy and service being taught by the example of the platform instructor. When the roadwork has been mastered, the student should be given a final examination on rules and operation by the chief instructor. Before the student goes to work the superintendent should give him a final talk on courtesy, service and public relations.

When the student has become a probationary trainman he should be introduced to the car starters and other supervisors under whom he is to work, if he has not already met them. The most favorable impression can be made on the new man if the chief instructor will take pains to spend some time with him on his first few trips alone. Then a six months probation period should be provided, during which time the work of the new employee should be carefully followed. It would be well for all reports of violation of rules during this period to be handled by the chief instructor, particularly the minor ones, which show the unfinished trainman.

Training Platform Men*

The Author Outlines the Procedure in Preparing a New Man for the Responsible Duties Connected With the Operation of an Electric Car—He Cautions Against Confusing the Student With Too Much of Detail

By W. A. Robertson

Superintendent of Railways, Eastern Texas Electric Company, Beaumont, Tex.

THE selection and training of platform men is a science, the fundamentals of which are possessed in some degree by all, and should be studied and developed by those to whose care is trusted the training of platform men for street railway work if competent platform men are to be made. It is only in the past few years that serious consideration has been given to the selection and instruction of platform men; but since it has been realized that this feature is of vital importance to the success of public service work much thought has been given to it and much has been written concerning it. In this problem we have been brought face to face with the realization that the greatest factor in better public relations is vested in our platform men.

In employment department work the size of the organization controls to a great extent the methods to be followed. In all cases the person to whom employment is intrusted must be a good judge of men, and have a forceful personality along with a pleasing and kind manner. Those characteristics should also apply to the men who have charge of the instruction of the students.

The law of first impressions applies very forcibly to the man entering into a new job, hence particular care should be taken to see that his reception is such that the psychological effect will be desirable. The details may vary, but the important thing in starting a new man is to make him feel that he is going to become a member of a happy and contented family and not a mere cog in a machine.

The form of application blank to be used was thoroughly discussed in the report of the American Electric Railway Association committee at the last convention, hence need not be discussed here. If, after a preliminary verbal examination, the applicant appears desirable, he should be allowed to fill out a suitable application form with the necessary references, releases, etc., and his references and past record should be investigated and all data then placed on file. When men are needed they should be selected from the applications on file, for in this manner a greater number can be had to select from, a more intelligent selection can be made, and this should result in a better class of platform employees.

*Abstract of paper presented before the Street & Interurban Railway Section of the Southwestern Electrical & Gas Association, San Antonio, Tex., May 3-6, 1922.

Engineering and Business Education

A SECOND conference* on commercial engineering, to discuss business training of engineers and engineering training for students of business, was held at the Carnegie Institute of Technology, Pittsburgh, Pa., on May 1 and 2, under the auspices of the United States Department of Education. (See ELECTRIC RAILWAY JOURNAL, April 22 issue, page 686.)

Following a discussion in which the subject was viewed from all angles, the following statement was prepared by a committee in order to set forth certain principles which the conference be-

*The first conference was held in 1919.

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lieved to be expressive of the proper aims and purposes of educational institutions and industrial organizations represented at the conference:

1. It is believed that the engineering profession will be advanced in honor and dignity, and in its capacity to render a maximum of service to humanity, if in the schools a substantial effort be made to impart to students an adequate conception of the broad field of action which is theirs in the realms of production, distribution, and finance.
2. It is submitted that the principal means for accomplishing this aim lies in a continuance of the sound and substantial work of the established schools, supplemented and broadened where practicable by instruction in economics and business subjects and in the basic principles of production or industrial engineering; in which, however, no specific curriculum additions are suggested beyond those recommended by the first conference in 1919.
3. It is recommended that established schools of commerce and business take under serious advisement the policy of supplementing standard curricula by the introduction of work in the elements of engineering, in order that more of the business men of the future may have a sympathetic understanding of construction problems that are fundamental to economic progress.
4. It is believed that much may be accomplished through more active researches in industrial and commercial lines, to the end that systematic scientific methods may be applied in meeting the problems and needs of industry; this with special reference to the elimination of unnecessary wastes, the conservation of material and human resources, and the lessening of production costs of standard commodities of commerce.
5. The conference recommends that colleges of engineering and of business adopt the following procedure in developing business training of engineers and engineering training of business men: (a) Secure the co-operation of industry in defining standard terminology and specifications of the requirements of industry. (b) Analyze the specifications of the requirements of industry to determine what are the fundamentals that must be taught, and organize the instruction accordingly. (c) Study and experiment with ways and means of discovering native bent and of measuring proficiency, that every student may be guided into a career of maximum achievement.
6. We reaffirm the purpose of the committee on commercial engineering of the United States Bureau of Education, and recommend that conferences under the direction of the committee be held at regular intervals.

Southwestern Association Elects Officers

THE Southwestern Electrical & Gas Association and the Southwestern Geographic Division of the National Electric Light Association held joint conventions in San Antonio, Tex., on May 3, 4, 5, and 6. Both conventions were attended by several hundred representatives of utilities represented in their membership.

At the concluding business session of the Southwestern Electrical & Gas Association on Saturday, R. J. Irvine of the Jacksonville (Tex.) Ice & Light Company, was elected president, succeeding C. E. Calder of the Dallas Power & Light Company. Other officers elected are: Joe H. Gill, Dallas Power & Light Company, first vice-president and chairman of the power and light section; Alves Dixon, El Paso (Tex.) Railway, second vice-president and chairman of the railway section; P. E. Nichols, Galveston (Tex.) Gas & Electric Company, third vice-president and chairman of the gas section. E. N. Willis, Dallas, was re-elected secretary and F. G. Ganno, Fort Worth, treasurer.

One of the most important steps taken during the convention of the Southwestern Division, N. E. L. A. was the creation of the Public Utility Information Bureau for Texas, which will be established in Dallas. George McQuaid, veteran newspaper man of Texas and Oklahoma, will be in charge. Members of the committee which had charge of the details of the bureau are: C. W. Davis, Dallas, chairman; George Clifford, Fort Worth; Fred M. Hoag, Dallas; Henry Morris, Dallas, and C. E. Calder, Dallas.

At the first general session on the opening day, Mayor O. B. Black of San Antonio, welcomed the delegates to the city. Bishop J. S. Johnston delivered the invocation and former mayor Clinton Brown delivered an address. Joint sessions of the two associations were held during the mornings, while the various sections met in sectional meetings during the afternoons. Each day's program included addresses, papers and discussions on the live topics and problems of interest at this time to the men engaged on the various utilities in this territory. Two of the papers read at the railway meetings were published in abstract in last week's issue of the JOURNAL. Others are printed in this week's issue; still others will be printed later. Chairmen of the various sectional meetings were: Technical section, J. B. Thomas; accounting section, J. E. Van Horn; commercial section, J. R. McCoy; street and interurban railway section, Alves Dixon.

Provisional Program for A.S.T.M. Convention

THE twenty-fifth annual meeting of the American Society for Testing Materials will be held from June 26 to June 30 at Atlantic City, with headquarters at the Chalfonte-Haddon Hall. The provisional program is as follows:

JUNE 26

Morning—Registration.
Afternoon and evening — Committee meetings.

JUNE 27

9:30 a.m.—Non-ferrous metals, metallography and corrosion.
3:00 p.m.—Wrought, cast and malleable iron.
8:30 p.m. — Presidential address and reports of administrative committees.
9:30 p.m.—Informal dance and smoker.

JUNE 28

9:30 a.m.—Steel.
Afternoon—Committee meetings.
8:00 p.m.—Symposium on impact testing of materials.

JUNE 29

9:30 a.m.—Fatigue of metals, methods of testing and nomenclature.
3:00 p.m.—Coal, coke, timber and shipping containers.
8:00 p.m.—Concrete aggregates, road materials and waterproofing; followed by preservative coatings.

JUNE 30

9:30 a.m.—Lime, gypsum and ceramics; followed by petroleum products, insulating materials, textiles and rubber.
Afternoon—Recreation, including golf and tennis tournaments.
8:30 p.m.—Cement and concrete.

Among the many topics of interest to electric railway men, the following are typical: June 27—Reports of committees on copper wire and wrought iron. June 28—report of committee on steel. June 29—some measurements of the shape of Brinell ball indentation; report of committee on coal; forms of specifications for purchasing coal; a rational basis for coal-purchase specifications; use of excess sand in concrete mixtures; report of committee on concrete and concrete aggregates; physical properties of subgrade materials; some physical properties of paints. June 30—reports of committees on electrical insulating materials, cement and reinforced concrete.

American Association News

Reports and Compilations Issued by Bureau of Information and Service

THE special reports and compilations prepared by the Bureau of Information and Service during April are listed below:

Motor Bus Operating Costs: Compiled from reports to the California Railroad Commission and from the technical press.

Motor Bus License Fees: A tabulation of the registration, license and other fees levied by state and local governments on motor vehicles operating as common carriers. May 1, 1922.

Trend of Material Prices: Information furnished by manufacturers showing relative price trend since 1914 of material used by electric railways.

Weekly Pass Results: A summary of the experience of electric railways with the weekly pass as shown by statistical records.

Trend of Trainmen's Wages, 1914-1921: Shows for a large group of city and interurban companies the number of trainmen employed, the average maximum hourly rate paid trainmen, and the number of years service required to reach the maximum.

Anti-Jitney Legislation: A second supplement, dated May 1, 1922, to a compilation of the same name originally issued May 1, 1921, giving a summary of the developments in the jitney situation throughout the country.

In addition to the above, supplements to the wage and other bulletins have been prepared, bringing them down to date.

Personnel Committee to Draw Up Tentative Set of Elimination Questions

THE problem faced by the T. & T. Association committee on personnel and training, which met in Chicago May 4, was to decide upon some basis which might form a starting point for developing a series of mental tests to be applied to applicants for the position of motormen. There was much disagreement as to what the initial elimination tests for motormen should

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Favorable Attitude Develops in Akron

Public Approves of Franchise Providing Five-Cent Fare Until 1924—New Viaduct Line to Be Built

Public attitude in Akron, Ohio, toward the Northern Ohio Traction & Light Company has taken an unusually favorable turn in connection with a proposed referendum on a new franchise recently granted by the City Council. Citizen mass meetings are being held protesting against the Council calling a referendum election, as provided for by the charter, to vote on the franchise.

The new franchise, as noted previously in the ELECTRIC RAILWAY JOURNAL, grants the company the right to charge a 5-cent fare until February, 1924, the time when the present 4-cent contract expires, and to construct a new line across the new North Hill viaduct and over Rider Avenue, to intersect its Cleveland line at Cuyahoga Falls Avenue. This provision removes the Cleveland, Kent-Ravenna, Cuyahoga Falls and some North Hill cars from the steep Howard Street hill. It also cuts the running time over these lines from five to seven minutes.

REFERENDUM MOVEMENT STARTED

Immediately following the final passage of the franchise-ordinance by the Council, politicians opposing the company started a referendum movement. A few of their followers, officers in four civic improvement organizations, met and adopted resolutions demanding that the Council order a referendum on the franchise. The Council had announced that a referendum would be called should the people desire. The action of the four officials of the four civic clubs had no sooner been announced than the cry went up from various sections of the city that the 5-cent fare was satisfactory and that the line across the viaduct was wanted.

North Hill citizens took the lead at a great mass meeting at which resolutions denouncing the proposed referendum and supporting the company were adopted. The action was practically unanimous, only two votes out of 750 being against it. Forest Hill and other sections followed suit, the feeling developed in each case being in support of the company. Citizens having no connection with the company went from one section to another demanding that attempts to strangle railway development be stopped. The people arose in unit, denouncing politicians back of the movement and declaring their faith in the company. Volunteer speakers pointed out that the fare was satisfactory and that the cars and service were equalled in few cities of like size.

The only part the company played was to announce it was ready to begin construction work as soon as it could, legally; that is, as soon as the time limit for calling a referendum had expired. It pointed out that a referendum would cause delay.

The feeling evidenced shows rather conclusively that the citizens of Akron —car riders and property owners— want the transportation problem settled and determined to settle it even though it takes mass meetings to do it.

BUS LINES AS FEEDERS TO BE STARTED

One of the first steps in the development will be the new line over the viaduct to the North Hill-Cuyahoga Falls district, over which the Cleveland interurban cars will also be routed at great saving in power and time. The next step will be the establishment of five new bus lines as feeders to the present system. This will be done within the next sixty days.

Cars are now operated to the north over Howard Street, a narrow roadway, having a hill with a grade of 13.5 per cent. The viaduct has only a 1.5 per cent grade. Extreme care has been necessary in the operation of cars over the Howard Street hill in order to prevent accident. The precautions adopted to insure safety there have included the use of block signals and adherence to the rule permitting only one car at a time on the hill. In consequence much time has been lost in operating cars on the line and the cost of operation has been increased inordinately.

Key Route Bay Terminal Approved

The plan for improving ferry service across San Francisco Bay by establishing a terminal on Goat Island, which was recently proposed by the San Francisco-Oakland Terminal Railway, and which was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 1, has been approved by Oakland merchants and by the Oakland Chamber of Commerce. A resolution passed by the Chamber of Commerce and which is addressed to Federal authorities points out that "such a terminal will be of great commercial value to the communities on the east shore of San Francisco Bay and San Francisco proper and will bring these communities into closer relationship, resulting in mutual benefit." The resolution urges that the application for permission to construct such a terminal be given early hearings and prompt decision.

"Fourteen" Taxpayers Win

Supreme Court Renders Decision Against City Levying Taxes to Pay Operation of Railway System

The "fourteen taxpayers" won their suit, to defend the general fund of the city of Seattle from invasion by the Seattle Municipal Railway, when the State Supreme Court on April 29, handed down a decision which determines that the city cannot levy any taxes to pay for maintenance and operation of the street railway system, nor can it divert any money from the general tax fund to aid the railway by loans without a vote of the people. The decision reverses that of Judge J. T. Ronald in the Superior Court of King County, who held that the city not only has the power to levy taxes for the maintenance and operation of the railway, but that it is the duty of the city to do so should occasion arise.

DIVERSION OF FUNDS ATTACKED

Because the street railway system has been a losing venture and one which would make the return of borrowed funds uncertain, the State Supreme Court held that the city should be enjoined from borrowing from the general fund to bolster temporarily the operation and maintenance funds of the street railway. In other cases involving borrowing from one fund to another, the court has held that such a course could be followed where the income of the fund aided was assured, making return of borrowed money certain. In this case, however, the court ruled, the record of losses of the system under city operation is such as to lead the court to conclude that "the results ultimately will be that the moneys borrowed will be permanently diverted."

The fourteen taxpayers brought their suit in defense of the general tax fund early in 1921, when a loan was made to the railway from general fund moneys to aid in the payment of interest to the holders of the $15,000,000 of bonds given to Stone & Webster for the street car system. The suit was brought to enjoin the city from any further invasion of the general fund in behalf of the railway. In its defense, the city has contended that it has the power to levy taxes for the railway, but is not obligated to do so. Another suit was then brought by the Puget Sound Power & Light Company to prevent the Superior Court from adjudicating the question and in that case, Judge Neterer held that the Superior Court had jurisdiction. He was upheld by the Circuit Court of Appeals and later by the United States Supreme Court.

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Louisville Is Proud of These Men

Many electric railways have organized basketball teams among their employees. All of the companies are proud of the men who compose their "fives." There is no electric railway organization, however, that is prouder of its team than is the Louisville Railway. There is every reason why it should be. The men composing the Louisville "five" played some remarkable ball during the past seasons. They won second place in the Commercial League of Louisville, with ten games won and four games lost. The men showed real action all through the season, and every time they played a goodly number of their fellow employees cheered them on. Of course a league of basketball teams among electric railways is out of the question, but if such were possible the Louisville team would undoubtedly be found well up toward the top at the end of the season if not actually at the top. That the men composing the Louisville team are a formidable looking lot is attested by the accompanying engraving. If other teams organized among employees of electric railways that are within easy riding distance of Louisville think they would like to try conclusions with the men from that city, then the Louisville men would probably be more than willing to book games for next season. The names of the men composing the team as shown in the accompanying photo are: Seated in front, C. L. Carlton; first row (seated left to right), Arthur Meyer, William Bunnell, Forest Raley and Maurice Cook; second row (standing left to right), Artis Yager, L. H. Broadus, George Ecken, Joseph Cain and William Schanzenbacker.

LOUISVILLE RAILWAY'S FAMOUS "FIVE"

Commission Recommends Relief for Railway

The Michigan Public Utility Commission has recommended that Sault Ste. Marie, Mich., furnish some relief to the Sault Ste. Marie Railway, which recently asked permission to discontinue service, setting forth that it was losing money monthly. The commission will probably grant the request unless some relief is obtained. The city has already discussed the question but has been unable to agree upon a plan for relief. It is believed, however, that the city will come to some agreement with the company rather than lose its railway line.

Cleveland Wages Go to Arbitration

Whether Cleveland street car operatives are to have their pay reduced 5 cents an hour, as proposed by the Cleveland Railway, is to be decided by a board of arbitration. The men's union, Local No. 268, by a vote of two to one, rejected the proposition of John J. Stanley, president of the company, that the agreement that was in force between the company and the union up to May 1 be continued unchanged except for the 5-cent reduction in pay. The men rejected this proposition even though they understood the refusal meant that a board of arbitration would be formed to settle the question and draft a new agreement.

The old agreement between the company and men was a closed shop contract. Company officials will insist upon the board of arbitration deciding whether any new agreement with the union is to be of a closed shop nature. Union officials now are objecting to the arbitration board considering the closed shop question, but company officials are insistent that inasmuch as the old agreement terminated on May 1 the arbitrators shall also decide whether the new agreement is to include a provision calling for the employment of only union men by the company, as has been the case heretofore.

The union is to name its arbitrator within the next few days and the company is expected to follow suit shortly thereafter. In case these two arbitrators cannot decide upon a third man within ten days, the choice is to be made by Federal Judge D. C. Westenhaver.

Any decision on wages made by the board of arbitration is to be retroactive to May 1.

Wage Conferences End in Agreement

As was reported in the ELECTRIC RAILWAY JOURNAL, issue of May 6, an agreement was reached in Salt Lake City by which the employees of the Utah Light & Traction Company accepted a cut in wages from 50 cents to 47 cents for first-year men and a cut from 57 cents to 54 cents for those longer in service. The scale accepted is about half of the cut at first proposed by the officials of the company, who opened wage conferences about a month ago. The old and the new schedules in cents per hour together with the intended rate after Nov. 1 are:

TRAINMEN

	Old Scale	Present Scale	After Nov. 1
First year's service	50	47	45
Thereafter	50	54	52

CARHOUSE AND SHOPMEN

	Per Hour	
	Old Scale	Present Scale
Painters—		
First grade	59	57
Second grade	46	45
Helpers	41	40
Carpenters—		
First grade	59	57
Second grade	46	45
Helpers	41	40
Welders—		
First grade	59	57
Second grade	46	45
Third grade	41	40
Blacksmiths—		
First grade	59	57
Hammermen	46	45
Helpers	41	40
Machinists—		
First grade	59	57
Second grade	46	45
Helpers	41	40
Armature winders—		
First grade	59	57
Second grade	46	45
Helpers	41	40
Electrical department—		
First grade	59	57
Second grade	46	45
Helpers	41	40
Barnmen and pitmen—		
First grade	52	50
Second grade	46	45
Helpers	41	40
Car cleaners	41	40

TRACK AND ROADWAY DEPARTMENT

	Per Day of 9 Hrs.	
Switch repairers	$4.50	$4.25
Welders	5.50	5.00
Track cleaners	3.65	3.25
Teamsters	3.65	3.25
Bonders and yardmen	3.65	3.25
Trackmen	3.65	3.25

Appreciation was expressed by General Manager Dicke of the manner in which the press of Salt Lake City handled these wage conferences.

Will Settle Wage Differences

Arbitrators have been chosen by the Cincinnati (Ohio) Traction Company and the Union of Stationary Firemen and Oilers to settle a wage dispute. The union's agreement with the company expired on May 1 and negotiations had not resulted in an adjustment. The men now receive 60 cents an hour. The company requested them to accept 50 cents an hour. This is a reduction of 17 per cent from the present wage, but only 4 per cent reduction from the 1919 wage of 52½ cents an hour. The company contends there has been much more than a 4 per cent reduction in the cost of living since 1919.

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$218,000,000 Construction Program

Tentative Plans Announced for New Rapid Transit Construction in New York

Plans for seven subway construction projects, to cost $218,000,000, were announced by the New York Transit Commission on May 11. A total of 32.55 miles of new route, with 84.20 miles of track, is provided by this program, which calls for completion of the entire system within five years from the time construction begins.

The new lines are designed to relieve congestion on existing routes, link up new sections of the city with the main subway system and generally put transit facilities a few years ahead of traffic requirements.

Staten Island will be brought into direct rail communication with the heart of Manhattan by a tube under the Narrows, connecting with the Fourth Avenue subway in Brooklyn.

1. Corona-Flushing extension	$2,800,000	3½ years
2. Forty-second Street moving platform	6,000,000	3 years
3. Staten Island tunnel	17-21,000,000	5 years
4. Seventh Avenue-Central Park West subway extension from Fifty-seventh Street	26,500,000	3½ years
5. Long Island City-Brooklyn crosstown	24,000,000	3 years
6. Fulton Street elevated extension (subway) to lower Manhattan	28,000,000	5 years
7. Eighth Avenue-Amsterdam Avenue west side subway, Chambers to 181st Street	69,500,000	3-4 years

To the actual construction charges the Transit Commission adds the money for engineering expenses, preparation of plans and interest of funds spent until the lines are in operation, totaling $44,000,000.

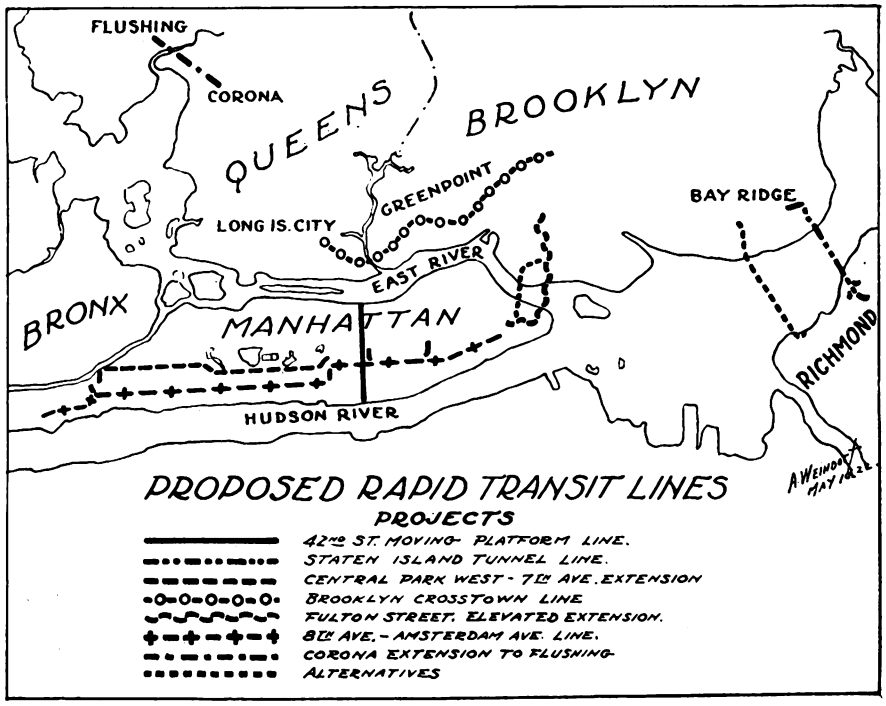
Long Island City will be linked to Brooklyn, and a direct route from Queens to the Coney beaches will be obtained by a new line from the Queensboro Bridge plaza, connecting at Fulton Street in Brooklyn with the Brighton Beach lines.

Relief for Washington Heights and west side Manhattan will be obtained by building the most elaborate subway yet dreamed of along Eighth, Amsterdam and Fort Washington Avenues, from Chambers to 181st Street. It will have eight tracks in the section from Fourteenth to Forty-second Street, affording opportunity for a loop system to take in the new Queens extension along Forty-second Street, the Fourteenth Street-Eastern District line and the Long Island City-Brooklyn subway.

The Lenox Avenue traffic jam will be relieved by extending the present Brooklyn Rapid Transit Broadway-Seventh Avenue line from Fifty-seventh Street north under Central Park West and Seventh and Eighth Avenues as far as 155th Street. This line would get Polo Grounds crowds, and the Transit Commission also explains that its construction would "hasten the time for removal of the Sixth Avenue elevated line."

Shuttle service under Forty-second Street from Grand Central to Times Square will give way to a moving platform equipped with seats, which will be designed to operate from river to river so as to make connection with the seven existing subway and elevated lines and the new Eighth Avenue line. The north and south trunk lines crossing Forty-second Street will have a total of twenty-seven tracks when this new line is built.

Continuation of the present elevated line from Corona into Flushing as a subway is fixed by the Transit Commission as the first project to be started, but it suggests that its entire construction program be started without delay, inasmuch as no new lines have been planned since 1913.



MAP SHOWING DISTRICTS OF THE CITY THAT WOULD BENEFIT BY PROPOSED CONSTRUCTION

A statement of the cost of the new lines and the probable length of time required to complete them is shown in the accompanying table.

The accompanying map shows the territory in which the new lines will be built. All of them, as previously explained, will connect with routes now in operation, but the existing routes are not shown on the map because the map with all the lines, new and old, could not be reduced to printable size.

The several new routes projected will add the following track and route mileage to the present mileage of the dual system:

No.	Classification	Length of Route in Miles	Length of Tracks in Miles
1.	Flushing extension	1.90	5.20
2.	Forty-second Street moving platform line	2.00	4.00
3.	Staten Island tunnel, either alternative	3.20	6.40
4.	Central Park West-Seventh Avenue extension	5.40	12.50
5.	Brooklyn Crosstown line	6.25	12.50
6.	Fulton Street elevated extension	2.80	5.60
7.	Eighth Avenue-Amsterdam Avenue line	11.00	38.00
	Total	32.55	84.20

With the time limitations in view that would be imposed by the time required to build new lines, the commission took up the matter of necessary new construction shortly after its appointment. It has since had under consideration a variety of routes and plans, studied out and prepared, in the first instance, by its consulting engineer, Daniel L. Turner, and from among these, has agreed upon the seven major projects previously outlined as the first to be presented. It will proceed with the formal adoption of the particular routes included, and take whatever other steps are necessary to set the actual work in motion, after opportunity has been given for full public discussion.

Wage Agreement Signed

A wage agreement was recently entered into between the management and employees of the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway Company, New Brighton, Pa., which became effective on May 1, 1922, and which will terminate on April 30, 1923. The rate of wages for trainmen in cents per hour is as follows:

First three months	44
Next nine months	47
After one year	53
One-man car operators	5 cents additional

Under Section 1 of the General Order it is agreed that the hours of service will be made as nearly equal as possible on the basis of a maximum of eleven hours and a minimum of eight hours with a 10 per cent leeway. It is understood that the 10 per cent leeway means the total number of hours under eight hours and over eleven hours. Both the management and employees agree to avoid all controversies during the life of this contract.

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Interesting Electrification Lectures Being Arranged

L. K. Sillcox, general superintendent of motive power of the Chicago, Milwaukee & St. Paul Railway, has arranged with several of the more important educational institutions of the country for a series of lectures on this property's electrification to be given by technically trained members of his staff. While the lectures primarily are given for the information of students of engineering and the faculty of the various colleges it is desired in addition that they be attended as far as possible by other persons who are interested in this subject. These lectures are illustrated by lantern slides and more than 2,000 ft. of moving picture film. No charge is made for the lectures, but it will be necessary for the organization to furnish a moving picture machine with operator, also lantern slide projecting machine with the necessary screen.

A tentative schedule of lectures on the mountain division electrification by members of the mechanical staff of the railway includes one on May 15 at Minneapolis under the auspices of the Minneapolis Traffic Club, May 17 at Columbus, under the auspices of the Ohio State University, and on May 23 at Lafayette, Ind., under the auspices of Purdue University.

The railway company has issued an interesting and instructive sixty-two-page booklet showing some attractive views of the country traversed by the electric cars, some data on transmission lines, substations, etc. A diagram showing the profile of the Great Continental Divide and Cascade Range with its electrified districts is included in this pamphlet.

Plans for Extension Announced

The first definite step has been taken toward the construction of an extension of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad from Anderson Ferry, its Cincinnati terminal, to the Dixie Terminal in the heart of the business district. The West End Terminal & Railway Company, which will build the extension, has been incorporated with a capital of $10,000 under the laws of the State of Ohio. The incorporators are: H. Lee Early, grain merchant; Morgan Wamsley, banker; Louis B. Patterson, manufacturer. Dr. John H. Walton and Milton Sayler, attorney, who are residents of lower Ohio River towns, through which the interurban company operates.

A campaign will be launched to dispose of the preferred stock in the West End Terminal & Railway Company to patrons of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad. Actual work of building the extension, which will be about 6 miles and which will cost approximately $750,000, will be started within thirty days. After the company is organized, the officials will apply for a franchise to operate from the City of Cincinnati. When completed the extension will be operated by the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad. L. G. Van Ness, general manager of the interurban, will supervise the construction of the extension.

Suspension of Service Threatened in Muscatine

Trouble has again broken out between the City Council of Muscatine, Ia., and the Clinton, Davenport & Muscatine Railway, a subsidiary of the United Light & Railways Company. The company on May 9 notified the city authorities that railway service would end and the dismantling of the traction system would begin on May 20 if the city persisted in forcing through a paving program.

This paving program would entail an expense of $50,000 on the company according to a letter of B. J. Denman, president of the railway. This expense, he declared, the company could not afford to bear. He offered to make repairs which he declared would put the lines in good shape for several years to come. But paving between the street car tracks and laying of new trackage the company could not and would not do, Mr. Denman stated.

The city refused to accede to the company's substitute paving and repairs program notwithstanding intimation from President Denman on April 26 that forcing through the paving program would mean withdrawal of service.

The letter from Mr. Denman, dated May 9, goes on to say that the road has for years barely been paying operating expenses and that it has never earned any revenue. The company further offers to remove its equipment prior to May 20 in case the city authorities wish this to be done.

The present controversy grew out of a new city paving program and particularly over the city's insistence that the company pave between its tracks. This situation is reviewed in a letter of last month from President Denman to the Muscatine Council.

Resolution Prohibiting Issuance of Tax-Exempt Securities Reported

The resolution introduced into the House by Representative Green of Iowa proposing a constitutional amendment prohibiting the issuance of tax-exempt securities by federal, state or local governments has been formally reported by the ways and means committee. Estimates obtained by the committee, the report said, showed that tax-free securities now amount to between $10,000,000,000 and $18,000,000,000 and that the right to issue was "a constant temptation to issue in larger amounts than is necessary."

The report said that the present system enables much property to escape taxation, unfairly discriminates between taxpayers, impedes private financing, discourages investment in new enterprises and creates social unrest.

Saginaw Settlement Plan Reported Presented

According to press advices from Saginaw, Mich., George W. Weadock, representing Otto Schupp, trustee for the Saginaw-Bay City Railway, presented to the Saginaw City Council on the evening of May 9 a proposition for settling the franchise questions arising out of the suspension of electric railway service some time ago. The proposal from the trustee came as a result of urging by a committee of citizens and other local bodies. It is understood to have included a plan for the complete elimination of jitneys, restoration of railway service and the operation of buses to the outlying factory districts by the railway. Mr. Weadock said that he would present an authoritative statement covering the proposal to the Council on May 12. On this account consideration of the whole matter was put over by the Council to that date.

News Notes

New Franchise Prepared. — Provisions for regulation of fares at the end of ten years and every five years thereafter are included in the substitute franchise for the Cleveland, Painesville & Eastern Railroad, now being considered by the City Council of Euclid, Ohio. The franchise, if accepted, will run for twenty-five years. The former ordinance, changed at the request of the Council, was for ten years. The new franchise now being considered places the fare at 5 cents in Euclid, and commutation tickets at 2 cents.

Lease Before Commission. — The Frankford Elevated lease now waits on the approval of the Public Service Commission, the document having been indorsed by the City Council and having been signed by T. E. Mitten, president of the Philadelphia Rapid Transit Company and Mayor Moore. If the commission finds no flaw in the provisions the lease will become an actuality by May 13. The lease is for a term of five years with a graduated return to the city of from 1 per cent in the first year of operation to 5 per cent in the fifth.

Dissension Over Two Fares.—A controversy has arisen over the matter of fares on the electric railways in Long Island City that appears likely to reach the courts. Following the separation of the operation of the lines of the Steinway Railway, now in receivers' hands, from those of the New York & Queens County Railway it was announced that a separate fare would be charged by the Steinway Railway with the result that passengers over that line traveling to New York would pay a 10-cent fare. The commission sought to prevent the rearrangement in fares pending an inquiry into the matter.

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Financial and Corporate

Chicago "L's" Would Consolidate

Another Railway Readjustment That Makes for Corporate Simplicity in Financial Structure

The Northwestern Elevated Railroad, the Metropolitan West Side Elevated Railway and the South Side Elevated Railroad, Chicago, have filed a petition with the Illinois Commerce Commission for the right to consolidate the several companies into one corporation. These companies and the Oak Park Elevated Railroad have been operated as a joint property for some years, but have retained their corporate identity. This has involved many complications of accounting and financing.

The valuation of the several companies was fixed at $86,250,000 as of June 30, 1919, by the Illinois Public Utilities Commission, this total being made up as follows:

Northwestern Company	$24,941,887
Metropolitan Company	29,215,704
South Side Company	23,013,294
Oak Park Company	9,079,115

Between June 30, 1919, and Feb. 28, 1922, additions were made to the properties to the extent of $432,900, making the total value as of the latter date $86,682,900. The valuation made by the commission excluded property costing $711,204 owned by the company but not used in railroad business.

The Oak Park Elevated Railroad has been in a receivership since Nov. 13, 1911, and a decree has been entered ordering the sale of the property subject to the lien indebtedness of the company aggregating $5,157,862. Of this indebtedness $5,000,000 is represented by the company's first mortgage 5 per cent bonds due July 1, 1928. The Northwestern Company is liable as guarantor for the payment of the principal and interest on these bonds and the mortgage is a lien upon the north side of the union loop. The receiver of the Oak Park Company is indebted as of Feb. 28, 1922, on outstanding receiver's certificates, for power and for accrued interest in the sum of $2,984,581.

The petition states that the petitioners are assured that the holders of these receiver's certificates and other receiver's indebtedness are willing to surrender and cancel them in exchange for $2,600,000 in par amount of the capital stock of a corporation formed by the consolidation of the several companies. The petitioners believe that such a consolidated corporation should acquire the property of the Oak Park Company at a judicial sale subject to the lien indebtedness above mentioned, by issuing $2,600,000 of its capital stock to retire the indebtedness of the receivers, and by paying or assuming other liabilities of about $400,000 of the receiver.

On April 25 the board of directors of each of the companies adopted a resolution expressing a desire that the companies be consolidated into a single corporation, calling a special meeting of the stockholders for the purpose of submitting to their vote this question of consolidation, expressing a desire that the consolidated corporation acquire the property of the Oak Park Company on the terms set forth above, and directing that application be made to the commission for an order approving such consolidation and authorizing the acquisition of the Oak Park Company.

The first board of directors of the consolidated corporation would consist of five men, named in the petition as follows: Samuel Insull, Britton I. Budd, John H. Gulick, S. A. Russell and R. Floyd Clinch. After the consolidation is effected the corporation is to acknowledge and deliver two trust deeds or mortgages of its properties, one securing first lien and refunding mortgage bonds to be issued thereunder, which shall provide for a series of bonds designated "Series A," and dated Jan. 1, 1922, payable Jan. 1, 1947, and bearing interest at the rate of 7 per cent. The other mortgage would be subject and subordinate to the first lien, securing income bonds to be issued thereunder in the aggregate principal amount of $17,120,000, dated Jan. 1, 1922, payable Jan. 1, 1952, and carrying interest up to but not exceeding 6 per cent, payable only if earned. By means of these new securities, the companies would discharge and cancel the following stocks, notes and indebtedness of the several constituent companies:

(a) The entire outstanding capital stock of the Northwestern Company, consisting of 98,908 shares of the par value of $100 each, making a total par value of	$9,890,800
(b) The entire outstanding capital stock of the Metropolitan Company, consisting of 161,703 shares of the par value of $100 each, making a total par value of	16,170,300
(c) The entire outstanding capital stock of the South Side Company, consisting of 102,314 shares of the par value of $100 each, making a total par value of	10,231,400
(d) The outstanding 5 per cent note of the Northwestern Company, dated Aug. 3, 1916 (payable to the order of the company and by it endorsed in blank) in the principal sum of	290,000
(e) The outstanding 5 per cent note of the Metropolitan Company dated Aug. 3, 1916 (payable to the order of the company and by it endorsed in blank) in the principal sum of	620,000
(f) Indebtedness of the Northwestern company for electrical energy	544,683
(g) Indebtedness of the Metropolitan Company for electrical energy	1,055,959
(h) Indebtedness of the South Side Company for electrical energy	426,173
Total	$39,229,315

In exchange for the surrender and cancellation of these stocks, notes and indebtedness, the consolidated corporation would issue $17,120,000 of its income bonds, $19,172,500 of capital stock and not to exceed $1,600,000 of its first lien and refunding bonds of Series A, but only on deposit with the trustees of the first lien and refunding mortgage of an equal par amount of such obligations, as may by the terms of such mortgage be deposited hereunder as a basis for the issuance of these bonds.

Britton I. Budd, president of the several elevated companies, believes that this consolidation will so shape the finances of the companies that it will be possible to purchase 100 new cars at a cost of approximately $2,000,000. If the consolidation is effected this will be an important step in the improvement of the elevated facilities. Plans for these cars have been under consideration for some time and bids on them have been asked.

Sale of Stock to Public Successful

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., recently completed the sale to home investors of a $3,000,000 issue of 8 per cent cumulative preferred stock. The issue, which was placed on sale in June, 1921, was advertised exclusively in Milwaukee and Wisconsin newspapers and was sold out April 13, 1922. To satisfy a continuing demand from small investors, approximately $300,000 of the stock was obtained by the company from large holders and redistributed in small lots between April 13 and April 29.

According to an analysis prepared by the company's securities department, the issue is held by approximately 3,300 women and 5,000 men, a total of 8,300 individual and joint owners, of whom approximately 6,000 live in Milwaukee, 2,170 in 200 other Wisconsin cities and towns and 130 in other states.

The securities department, which also serves the Wisconsin Gas & Electric Company, an affiliated concern, is now selling the last half of that company's recent issue of $500,000 preferred 7 per cent stock. A large share of this issue was subscribed for by 450 officers and employees of the company. When this issue is sold there will be offered for sale another $3,000,000 issue of cumulative preferred stock of the Milwaukee Electric Railway & Light Company identical in character with the 8 per cent issue, except that the dividend rate will be 7 per cent in line with the declining cost of new capital for the public utility business. The issuance and sale of this stock has been authorized by the Wisconsin Railroad Commission.

The two affiliated companies serve the southeastern part of Wisconsin and now have approximately 16,000 investors in this territory and about 18,000 in the entire State of Wisconsin. Both have been pioneers in the sale of securities direct to the public.

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2,491,909,178 Passengers

437 Rides per Capita in New York City—Other Interesting Facts in Commission Report

The summary of the report of the Transit Commission of New York City for the year ended Dec. 31, 1921, contained many matters of interest that it was impossible at the time to include in the article "128,321,809 More Passengers," published in the ELECTRIC RAILWAY JOURNAL for Jan. 14, page 85. This is true particularly with respect to figures of traffic handled and earnings.

At the end of the fiscal year, namely, June 30, 1921, there were under the jurisdiction of the commission seventy-one common carriers, of which fifty-eight were street and electric railways, eleven steam railroads and two stage-coach corporations.

The combined capitalization of all companies, that is, the capital stock and bonds at par value, plus certain certificates of indebtedness, etc., was $1,333,972,116. Excluding duplications, the net capitalization was $1,280,662,177, which was an increase over the year 1920 of about $59,000,000. This increase was largely due to the opening of new lines constructed by the city of New York under the dual system contracts. As soon as such lines are opened the bonds issued by the city for their construction are included in the outstanding capitalization of all the companies. The city is now represented in this list by $261,597,725, in securities. There has been some reduction in the gross capitalization of the street railroad corporations, totaling about $1,200,000, the most important items being a transfer by the Interborough Rapid Transit Company from capital to sinking fund, the retirement of mortgage bonds by the Prospect Park & Coney Island Railroad, and the payment of the funded debt of the Fifth Avenue Coach Company. It is interesting to note that the total capitalization of the several companies is nearly double the total in 1907, the year in which the Public Service Commissions were created.

The total increase of traffic on the street railroads for the fiscal year ended June 30, 1921, was 126,321,809. The traffic upon the Interborough Rapid Transit Company's subway and elevated lines increased 58,545,721 and that of the New York Consolidated Railroad Company (B. R. T.) 28,188,005, making a total rapid transit increase of 90,090,535 over the previous year, an increase of 6.33 per cent. The largest single increase was that on the subway division of the Interborough company, which was 53,287,147.

Due principally to a large increase in traveling on the lines of the Third Avenue Railway System, the Boroughs of Manhattan and the Bronx made the largest gain in the number of passengers carried upon the street surface lines. In Brooklyn, however, the surface lines as a whole showed a decrease of 14,829,624 passengers, or a falling off of 3.43 per cent. This de-

STREET RAILWAY TRAFFIC IN NEW YORK CITY, 1919-1921

Number of Revenue Passengers (Cash Fares)

	Fiscal Year Ended June 30			Increase* of 1921 over 1920	
	1919	1920	1921	Number	Per Cent
Subway and Elevated Lines:					
Interborough—					
Subway	461,147,058	586,098,633	639,385,780	53,287,147	9.09
Elevated	348,188,600	369,034,477	374,293,051	5,258,574	1.42
B. R. T. elevated and subway	305,021,402	376,782,635	404,970,640	28,188,005	7.48
Hudson and Manhattan tubes	86,050,815	92,250,836	95,607,645	3,356,809	3.64
Total	1,200,407,875	1,424,166,581	1,514,257,116	90,090,535	6.33
Street Surface Lines in					
Borough of Manhattan	370,084,711	349,772,761	384,128,024	34,355,263	9.82
Borough of the Bronx	80,806,261	94,141,991	107,675,507	13,533,516	14.38
Borough of Brooklyn	365,963,677	432,936,227	418,106,603	D 14,829,624	D 3.43
Borough of Queens (a)	46,723,575	49,562,574	51,944,034	2,381,460	4.80
Borough of Richmond	15,958,198	15,007,235	15,797,894	790,659	5.27
Total	879,536,422	941,422,788	977,652,062	36,231,274	3.85
Grand total	2,079,944,297	2,365,587,369	2,491,909,178	126,321,809	5.34
Population (b)	5,534,727	5,620,048	5,705,364	.....	....
Fares per capita	376	421	437	.....	....

*The prefix D indicates decrease.
(a) Exclusive of Brooklyn Rapid Transit.
(b) Estimated for 1919 and 1921 on basis of one-tenth of decennial increase, 853,165.

RESULTS OF OPERATION OF STREET RAILWAY COMPANIES NEW YORK CITY

Years ended June 30, 1908-1921

Fiscal Year	Street Railway Operating Revenue	Expenses of Maintenance and Operation	Taxes, Tolls, etc.	Operating Income (a)		Net Corporate Income (b)
1908	$69,026,612	$40,129,956	$4,330,227	$24,566,429		$2,665,764
1909	72,432,715	41,606,428	4,982,677	25,843,609		6,386,037
1910	79,593,910	43,586,932	5,148,324	30,858,654		9,559,816
1911	83,751,415	45,993,964	5,495,881	32,261,570		10,171,074
1912	88,242,144	47,667,562	5,803,790	34,770,792		12,073,641
1913	92,141,605	48,675,647	6,095,520	37,370,438		12,229,271
1914	94,155,521	50,117,712	5,895,935	38,141,874		11,849,985
1915	93,644,428	50,324,095	5,811,290	37,509,043		11,501,157
1916	98,628,185	52,038,312	6,238,461	40,351,412		12,352,438
1917	100,185,796	55,960,722	7,185,113	37,039,961		9,457,886
1918	103,499,463	60,699,402	8,232,851	34,567,210		5,266,496
1919	110,198,575	75,985,007	7,907,358	26,306,210	Loss	8,556,408
1920	127,880,161	96,059,603	7,353,757	24,466,801	Loss	10,725,522
1921 (c)	136,805,025	107,232,966	7,507,843	22,064,216	Loss	16,835,756

(a) Excess of revenue over expenses and taxes.
(b) Balance after interest, rents and other fixed charges.
(c) Provisional.

NUMBER AND CAPITALIZATION OF CORPORATIONS REPORTING TO TRANSIT COMMISSION

	Number	Capitalization (a)
Rapid transit railway owned by city of New York	...	$261,597,725
Steam and electric railroads	(b)58	922,523,409
Steam railroads	11	149,795,182
Stagecoach corporations	2	55,800
All common carriers	71	$1,333,972,116
Same, excluding duplications	71	$1,280,622,177

(a) Common carriers as of June 30, 1921, with exception of steam railroads, which are as of Dec. 31, 1920.
(b) Includes four companies that discontinued operation during fiscal year 1920, and city of New York, Department of Plant and Structures, as operator of Staten Island Midland Line.

STREET RAILWAY TRAFFIC (INDICATED BY NUMBER OF CASH FARES) IN NEW YORK CITY, 1860-1921, WITH PARTIAL DISTRIBUTION BY BOROUGHS

Year	Street Surface Railways					Total	Rapid Transit	Grand Total	Per Capita
	Manhattan	The Bronx	Brooklyn	Queens (excl. B. R. T.)	Richmond				
1860	38,455,242	.....	12,374,931	.....	.....	50,830,173	.....	50,830,173	43
1870	114,101,539	1,038,014	37,203,281	.....	121,086	152,463,920	.....	152,463,920	103
1880	148,615,107	1,775,485	77,928,395	1,052,380	213,905	229,585,272	60,831,757	290,417,029	152
1890	215,296,648	3,394,726	109,288,647	2,976,185	287,325	331,243,531	237,906,029	569,149,560	218
1900	360,002,672	21,364,690	204,106,397	11,441,751	6,872,856	603,788,366	242,564,692	846,353,058	246
1910	371,165,696	56,524,261	289,308,085	34,430,074	11,712,623	763,140,739	768,122,175	1,531,262,914	321
1911	382,046,845	62,777,966	305,977,350	42,515,629	12,301,757	805,619,547	798,281,850	1,603,901,397	330
1912	395,238,026	67,837,245	322,321,981	45,182,732	12,959,799	843,539,783	837,374,152	1,680,913,935	340
1913	419,722,253	74,702,309	345,987,401	47,463,382	13,568,066	901,443,411	868,433,097	1,769,876,508	352
1914	420,662,533	79,652,133	351,905,284	49,973,696	14,011,414	916,205,060	896,999,296	1,813,204,356	355
1915	415,551,116	81,502,803	354,700,113	52,686,108	14,312,009	918,752,149	888,880,577	1,807,632,726	348
1916	427,373,847	84,535,737	363,630,177	54,167,403	14,884,534	944,591,698	954,143,917	1,898,735,615	360
1917	349,788,114	71,153,030	373,079,651	50,906,681	15,238,157	860,165,633	1,058,646,596	1,918,812,229	358
1918	371,136,389	79,917,071	360,207,555	43,448,206	15,287,922	869,997,143	1,105,514,646	1,975,511,789	362
1919	370,084,711	80,806,261	362,105,288	46,723,575	15,958,198	875,678,033	1,204,266,264	2,079,944,297	376
1920	349,772,761	94,141,991	432,936,227	49,562,574	15,007,235	941,420,788	1,424,166,581	2,365,587,369	421
1921	384,128,024	107,675,507	418,106,603	51,944,034	15,797,894	977,652,062	1,514,257,116	2,491,909,178	437

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crease occurred entirely upon the lines of the Nassau Electric Railroad, which showed a loss of nearly 29,000,000. Other surface lines in Brooklyn gained more than 14,000,000. The heavy loss of the Nassau Electric Company was due mainly to the operation of the new Brooklyn line of the Interborough Rapid Transit Company and to the discontinuance of operation on a number of routes, the elimination of transfer privileges and cessation of operation of certain lines during a prolonged strike period. The Borough of the Bronx (Third Avenue Railway System) showed an increase of 13,533,516 passengers, or 14.38 per cent. This was the largest percentage of increase reported by any single system.

The accompanying tables show the number of revenue passengers reported by the different street railway systems, the population of the city and the average number of rides per capita for the fiscal years ended June 30, 1919, 1920 and 1921. They also show the street railway traffic for 1860, 1870, 1880, 1890, 1900, and for every year from 1910 to 1921 inclusive:

While the traffic showed a slight increase as above noted, the financial condition of the companies did not improve during the year. In fact, there was a large increase in the deficit. This deficit for the year ended June 30, 1920, was $10,725,522, while for the year ended June 30, 1921, it was $16,835,756. One of the three tables on page 806 shows the financial results of street railway operation for each fiscal year from 1908 to 1921 inclusive.

May Take Over Traction Line

The Joliet & Eastern Traction Company, Joliet, Ill., instead of being junked may be put in operation again if the efforts of Frankfort business men are successful. The line ceased operation between Joliet and Chicago Heights on April 15 by permission of the Illinois Commerce Commission when it was shown to that body that the road could no longer financially do business. It is said that Will Folkers of Frankfort announced that efforts would be made to buy 52 per cent of the stock of the traction line which is held by Joliet interests. He said that citizens of Frankfort at present hold about 30 per cent of the stock and that if the Joliet holdings could be purchased, the stock would be pooled and the road again placed in operation. The shortening of the road to Matteson and the use of one-man cars were also under consideration. The discontinuance of this service was referred to previously in the ELECTRIC RAILWAY JOURNAL.

Income Increases

A favorable showing has been made by the Louisville (Ky.) Railway for the first quarter of 1922 in comparison with the same period a year ago. Net income for the first quarter of this year was $167,611 compared with a deficit of $26,886 for the same period in 1921. In comparing these figures it is noted that the 7-cent fare was in effect only one month and eight days during that period in 1921. Operating revenues for the first quarter of 1922 were $1,131,106 and operating expenses and taxes were $828,710.

Securities of the railway have strengthened to a marked extent in recent weeks, reflecting the improvement in earning capacity and optimism on the part of officials of the company with regard to the outcome of the fare case litigation. The bonds have advanced steadily and are in strong demand, while the stocks, which are not listed on any exchange, are reported to be showing good advances.

Improved Conditions of New Haven Electric Properties

In its statement on the fiftieth year of operation the New York, New Haven & Hartford Railroad, New Haven, Conn., reports that its trolley properties showed a marked improvement over last year, both in increased revenue and reductions in expenses. This was made possible by the higher rates of fare with some decrease in rates of pay and cost of materials. The income accounts of the Berkshire Street Railway, the Connecticut Company, the New York & Stamford Railway and the Westchester Street Railroad for the year ending Dec. 31, 1921, are given herewith.

Illinois Central Makes First Issue of Stock

Directors of the Illinois Central Railroad have authorized an issue of $10,929,600 of 6 per cent convertible noncumulative preferred stock, series-A, subject to the approval of the Interstate Commerce Commission. This is the initial step in the financing of the vast project of a new terminal in Chicago and the electrification of the lines in Chicago. Approval of a total issue of $50,000,000 by the stockholders for this work was referred to in a recent issue of the ELECTRIC RAILWAY JOURNAL. Additional blocks of stock will be issued from time to time as the work of electrification progresses. The new stock will be offered at par to stockholders on record May 16 to the amount of 10 per cent of their holdings of common stock. It will be convertible at the holder's option into common stock after Sept. 1, 1922, on a share for share basis. It will also be subject to redemption as a whole on any semi-annual dividend date after Sept. 21, 1927, at a premium of 1.5 per cent and accrued dividends.

Road Ordered Sold by Court

Any hope that the Interurban Railway & Terminal Company, Cincinnati, Ohio, might resume operation has ended. Judge John A. Caldwell of the Hamilton County Common Pleas Court has signed an order authorizing the receiver for the interurban company, Charles M. Leslie, to dismantle the properties and sell them as junk, without further order of the court. Judge Caldwell's order was somewhat formal, as a similar order and authorization had been made by the Ohio State Public Utilities Commission.

The Interurban Railway & Terminal Company discontinued operating on March 25. Mr. Leslie said that the rails would be taken up and together with the poles and wires would be sold. All cars, motors, and machinery in power plants and other stations also will be sold. The proceeds will be used to apply to the claim of the bondholders. The discontinuance of operation was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 1.

	BERKSHIRE STREET RAILWAY		CONNECTICUT COMPANY		NEW YORK & STAMFORD RAILWAY		WESTCHESTER STREET RAILROAD	
	1921	Increase over 1920	1921	Increase over 1920	1921	Increase over 1920	1921	Increase over 1920
Total operating revenues	$1,098,354	$47,809	$14,619,210	$1,529,893	$560,847	$66,405	$231,339	D$7,699
Total operating expenses	853,082	D184,562	11,837,324	D 579,815	418,083	D39,241	241,192	D 34,813
Net operating revenue	245,272	232,373	2,781,885	2,109,708	142,764	105,646	†9,853	27,114
Taxes	57,491	12,285	611,027	D114,739	28,056	3,795	11,655	D 425
Operating income	187,781	220,086	2,170,858	2,224,448	114,708	101,850	†21,508	27,540
Non-operating income	2,206	D3,508	10,117	D1,222	1,480	D676	880	215
Gross income	189,987	216,578	2,180,975	2,223,226	116,188	101,174	†20,628	27,755
Deductions from gross income	*319,975	962	1,455,049	61,208	*101,444	482	*35,050	299
Net income	†$129,987	$215,615	$725,926	$2,162,017	$14,743	$100,691	†$55,678	$27,455

D—Decrease.
† Deficit.
* Deductions from gross income include $213,550 interest accruing to the N. Y., N. H. & H. R. R. but not included in the income account of that company.

D—Decrease.

D—Decrease.
* Deductions from gross income include $40,223 interest accruing to the N. Y., N. H. & H. R. R., but not included in the income account of that company.

D—Decrease † Deficit
* Deductions from gross income include $26,858 interest accruing to the N. Y., N. H. & H. R. R., but not included in the income account of that company.

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Public Is Entitled to All Facts

Following close of arguments begun on April 25, after postponement of one day, Judge H. D. Dickinson of the District Court on May 1 made a verbal order that the Twin City Rapid Transit Company, Minneapolis, Minn., open its minute and account books for inspection by Delos F. Wilcox, traction expert for the city of Minneapolis.

This verbal order was made formal and signed on May 2. It allowed three days in which to hand over the books. The ruling was made in preparation for hearing in a mandamus suit which was set for hearing on May 12, following action instituted by the city in an alternative writ of mandamus on the theory that in mandamus proceedings the court is authorized to grant either side the privilege of inspecting the books and records involved, before the trial.

Judge Dickinson said the Minneapolis Street Railway is being operated under chapter 278 of an act of the Legislature of 1921 and under this statute the motion appeared to be fully warranted. The important provision of the statute reads: "The commission or council have the right at all times to inspect by itself or by its representatives all books, records and accounts and street railway property of any street railway in any city."

The court said:

> Laying all fictions aside the Twin City Rapid Transit Company is the actual owner and supreme authority in the actual operation of the railway system of these two cities, including the suburban lines. Behind and beyond the screen of local legal entities is the master's hand and the master's voice, which cannot be mistaken or disobeyed. In short, the Twin City Rapid Transit Company is subject to the orders of a court of competent jurisdiction for the production of important records in a case of this kind which it might have in its possession and in its control.
>
> The public is entitled to the facts. There should be no secret about it, all should be above board; it is only fair, just and right that all records should be opened up. The public pays the toll, and the statute contemplates that the public is entitled to know what it is paying for.

Records sought by the city include books of the company back to June 4, 1891, of the Minneapolis Street Railway back to July 1, 1873, and the St. Paul City Railway dating from Aug. 30. 1877.

At present the rate is 6 cents. The company has asked 7 cents with four tokens for a quarter. The decision is to be made by the State Railroad & Warehouse Commission under the new Brooks-Coleman act on an appraisal of value of the property, final hearing of which before the commission on presentation by the city and the street railway is expected by the end of July

The St. Paul and Minneapolis lines being linked in the valuation and rate proceedings there is more delay than if there were only one line. In the case of St. Paul the rate hearing has been set tentatively to begin on June 1 before the commission. This is evidenced in a similar hearing for the Duluth line, in which the commission took testimony one day, adjourned, resumed and ended the case in a short time. As yet the Minneapolis city attorney has not moved for dismissal of the mandamus proceedings which are set for May 15, but the hearing is now unnecessary.

President Horace Lowry announced on May 4 that the books of the Twin City Rapid Transit Company would be brought to Minneapolis from New Jersey, and turned over to Delos F. Wilcox, the city's valuation expert, and Neil M. Cronin, the city attorney, for examination. Mr. Lowry said:

> Our counsel feel that there is no reason for producing the books of the Twin City Rapid Transit Company as they have no bearing on the case and are private corporate records, but inasmuch as the present order takes the other view of the matter we have decided not to contest the case any further. One of the main reasons for this decision is that we want the valuation work to proceed as fast as possible and we do not want the public to believe that we are concealing pertinent facts. I hope matters now may proceed rapidly as it is impossible for the company to get in any large amount of new capital until the valuation is fixed.

Net Receipts and Traffic Increase

The total receipts of the Boston (Mass.) Elevated Railway for the month of March, 1922, amounted to $2,868,518 against $2,991,781 for the same month in 1921. The total cost of service was $2,664,186, leaving an excess of receipts over cost of service of $204,332 compared with $200,848 in March, 1921. The total revenue passengers carried in March, 1922, were 30,889,032 against 29,695,375 in March, 1921. The reserve fund required by law was restored on April 1 to the amount of $919,863.

Lower Surplus in Baltimore

The twenty-third annual report of the United Railways & Electric Company, Baltimore, Md., shows a net income of $635,231 for operation during 1921. Total operating revenues were $16,332,865 and operating expenses and taxes amounted to $11,675,440. The surplus in 1920 totalled $1,043,599. According to the report of C. D. Emmons, president of the Baltimore property, this falling off in net earnings amounting to $408,369 was due to unemployment. The company did not suffer so severely as other companies, inasmuch as its decrease for the year was only 5.7 per cent of the gross earnings.

The company put into effect some important economies such as the installation of power-saving devices, additional one-man car operation and was thereby enabled to reduce operating expenses 4.78 per cent. A saving in the matter of wages was effected amounting to between $350,000 and $400,000 per annum.

The records of the safety department show that there were 15 per cent less railway accidents during 1920 than in 1919 and 20 per cent less in 1921 than in the preceding year.

In concluding his statement President Emmons referred to the cessation of dividend payments three years ago and the diverting of available money into improvements and betterments. He said that the result of this plan would eventuate to the benefit of the stockholders.

Mr. Insull Ready to Consider Offer for Elevated Lines

Samuel Insull makes the statement that he is willing to consider the sale of the Chicago elevated roads to the municipality. Mr. Insull has made this offer in writing to the Council subcommittee which is considering transit improvements. He had been invited to attend the sub-committee's session and in acknowledging the invitation said:

> When the plans of your committee take some definite form by way of a concrete suggestion for the acquisition of the elevated roads by the city I will be glad, as I have already told your committee, to take up and consider the matter promptly.

Net Operating Revenue Drops $85,500

The Salt Lake & Utah Railroad, Salt Lake City, Utah, in its annual report for 1921 filed with the Public Utilities Commission of Utah, shows that the company cut its operating expenses by $40,500 under the operating expense total for 1920. During the same period the operating revenue fell off $126,000. Thus the net railroad operating revenue dropped $85,500 for 1921, as compared with 1920.

Gross operating revenues of the railroad were $750,000 during the year. Gross operating expenses were $516,000, leaving the net revenue $234,000. From this were deducted taxes of $71,000, which showed an increase of nearly $6,000 during the year. There were also some increases in non-operating income of the railroad, and the gross income amounted to $167,000, from which interest of $150,000 on bonds, and other interest items totaling $5,500, together with an amortization of the discount on the funded debt of $13,666, leaving the total deductions $170,773.48. The company therefore closed the year with $3,821.27 less in receipts for the year than expenditures.

After paying dividends on its preferred stocks out of its surplus, the company shows a reduction in the corporate surplus of $76,000 during the year.

The Interurban Construction Company is owner of 90 per cent of the stock of the Salt Lake & Utah, other stockholders being prominent business men of Weber, Salt Lake and Utah counties. Total investments in the line are placed at $7,700,000.

Passenger revenue produced $363,000, and freight revenue $321,000. The main line, from Payson to Salt Lake, is 66 miles long, and the Magna branch 9 miles.

Abandon Service

The Ardmore (Okla.) Railway has ceased operation and the single one-man car that had been used for some time has been locked in the carhouse. The original franchise was granted in 1903 to run for a period of fifty years. About eight months ago the line went into the hands of T. B. Snelson as receiver. It is not known whether the property will be junked or another effort made to operate it.

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May Be Forced to Discontinue Service

Unless financial assistance is forthcoming at an early date it is likely that the Iron River, Stambaugh & Crystal Falls Street Railway, Iron River, Mich., will have to abandon service. This was the recent ultimatum of F. D. Sullivan, general manager, who stated that during the last two years the company had been operating at a loss. Aggregate losses of $9,000 during the past two years and an electric current bill of $1,900 were made a subject for discussion at a meeting of business men of Iron River to see if some solution could be found.

Car Riders in Toledo Pay Less Interest Rates

According to figures compiled by City Street Railway Commissioner Cann the car patrons of the Community Traction Company, Toledo, Ohio, are paying less interest a mile of track than any of the other five cities in that part of the country where the lines are operated on a service-at-cost plan. In other words, the Doherty interests, which own the Toledo property, are receiving less return per mile of track than are the owners in Cleveland, Youngstown, Rochester and Cincinnati. The comparative figures for the five cities follow:

Capital value of street railway property—Cleveland, $33,495,000; Youngstown, $4,300,000; Rochester, $19,216,000; Cincinnati, $38,067,950; Toledo, $8,500,000.

Miles of track—Cleveland, 376; Youngstown, 52; Rochester, 168; Cincinnati, 282.4; Toledo, 123.6.

Capital value per mile of track—Cleveland, $89,082; Youngstown, $82,692; Rochester, $114,654; Cincinnati, $138,372; Toledo, $68,770.

Population—Cleveland, 920,000; Youngstown, 150,000; Rochester, 297,000; Cincinnati, 401,247; Toledo, 243,400.

Population per mile of track—Cleveland, 2,420.2; Youngstown, 2,865.4; Rochester, 1,772.7; Cincinnati, 1,421; Toledo, 1,969.3.

INTEREST PER MILE

Interest per mile of track—Cleveland, $5,587; Youngstown, $5,502; Rochester, $6,307; Cincinnati, $5,847; Toledo, $4,207.

Interest charges per capita—Cleveland, $2; Youngstown, $2; Rochester, $3; Cincinnati, $4; Toledo, $2.

Total interest per year—Cleveland, $2,100,730; Youngstown, $306,912; Rochester, $1,057,098; Cincinnati, $1,650,937; Toledo, $520,000.

Each semi-annual period decreases the amount of the interest charge paid to the Doherty interests and a proportionate increase is made of payments to the municipal ownership fund. This fund, it will be shown by the commissioner's monthly report to the board of control on April 15, now amounts to just about a quarter of a million dollars.

The Cincinnati interest figures do not include payments on an unfunded debt of $510,541.

Makes Report on Electric Divisions

The electric divisions of the Boston & Maine Railroad, which include the Portsmouth Electric Railway and the Concord Electric Railways, report total revenues of $367,464 for the year ended Dec. 31, 1921. For the year ended Dec. 31, 1920, this item amounted to $403,902. Total operating expenses for 1921 were $315,464 against $357,466 for the previous year. From the net operating revenue of $52,001 tax accruals amounting to $26,766 were subtracted, leaving an operating income of $25,235 in 1921 against $23,121 for 1920.

Line Must Be Self-Sustaining

Abandonment of operation of Route No. 67 of the Philadelphia (Pa.) Rapid Transit Company, popularly known as the Zoo line, has been upheld by the Public Service Commission. The line is a single-track loop 2.48 miles in length with one-way operation.

The case was decided last September, but the opinion is just available through the printed report of the commission. The details of the case are, perhaps, not of so much general interest as are some of the remarks of the commission, in which the fundamentals are laid down that governed its action. The commission said:

> The street railway service must have steady, daily public patronage or it cannot be self-sustaining. The continued operation of one line in a general system that has not such patronage and is not self-sustaining imposes an unjust burden on the rest of the system and its patrons. These principles are fundamental in the street railway business.
>
> Sound economic principles dictate the abandonment of particular lines which cannot be made self-sustaining unless such abandonment results in real, substantial public inconvenience. The determination of the commission in this matter where the complainant is a private individual is made solely with regard to the general convenience of the public. It does not appear from the evidence that the restoration of service along route No. 67 is reasonably necessary for the accommodation of the public.

Financial News Notes

Change in Name Announced.—The name of the Madison Light & Railway Company at Madison, Ind., has been changed to the Madison Light & Power Company.

Sale Again Deferred.—The sale of the carhouse properties of the New York Railways situated in the block from Thirty-second to Thirty-third Street and Lexington and Fourth Avenues has been further postponed until June 8.

Two New Directors at Richmond.—John T. Wilson, Richmond, Va., and Daniel Stafford, New York, N. Y., have been elected directors of the Virginia Railway & Power Company, Richmond, to succeed C. B. Buchanan and Finley J. Shepard.

Net Improves.—The Winnipeg (Man.) Electric Railway for the three months ended March 31, 1922, reports gross earnings of $1,455,787, a decrease of $31,792 over the same period a year ago. The net income is given as $216,620 against $181,199 for the three months period in 1920.

Hearing on Application for Receiver Postponed.—Judge Mayer in the United States District Court at New York has adjourned until May 26 the hearing on applications made by the American Brake Shoe & Foundry Company and Clarence H. Venner for the appointment of a receiver for the Interborough Rapid Transit Company.

Extension at Increased Interest Approved.—The Department of Public Utilities has approved the petition of Worcester (Mass.) Consolidated Street Railway that it be allowed to extend for five years from Sept. 1, 1922, $500,000 of 4½ per cent bonds maturing on that date, the new interest rate to be 7 per cent.

Gold Bonds Offered.—William R. Compton Company and Bond & Goodwin, both of New York, are offering $625,000 of 6 per cent gold convertible debenture bonds of the Texas Electric Railway. The bonds are dated Jan. 1, 1917, and are due Jan. 1, 1942. They are offered at 87 and accrued interest to yield about 7.25 per cent. The St. Louis Union Trust Company, St. Louis, is the trustee.

New Offering Announced.—Bonbright & Company, Inc., Hayden, Stone & Company and the Electric Bond & Share Company are offering $5,000,000 of 6 per cent gold debenture bonds, Series A, of the Utah Power & Light Company, operating the electric railway at Salt Lake City. The bonds, noncallable for twenty-five years, are dated May 1, 1922, and are due May 1, 2022. They are offered at 91 and accrued interest, to yield about 6.60 per cent.

Want to Sell Lines.—Because the Utah-Idaho Central Railroad, Ogden, Utah, has $1,000,000 bonded indebtedness and practically no money in the bank except to meet payrolls, W. A. Whitney, general manager, told the City Council that the company would sell its lines and equipment to the city or any other company. The statement came during a discussion of the paving of two blocks on Twenty-fifth Street. The general manager said the company had not made money for five years and could not undertake the paving.

New Company Shares Offered.—It has been reported recently that the West Penn Traction & Water Power Company, Pittsburgh, Pa., has offered common stockholders of the Monongahela Power & Railway Company $7.50 a share in cash and one share in common stock of a new company to be organized for their holdings, provided at least 78 per cent of the stock accepts the offer by June 10. Proposal seems certain of acceptance as 80 per cent of the stock has already assented. Representatives of the West Penn Traction & Water Power Company have been inspecting the properties of the Monongahela Power & Railway Company at Parkersburg, West Va., and Marietta, Ohio, in connection with the offer of purchase which has recently been made.

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Traffic and Transportation

Fare Injunction Stands

Louisville Company Wins Before Court of Appeals—Question of Confiscation May Now Be Argued

A decision of the United States Court of Appeals, sitting at Cincinnati, on May 5 was favorable to the Louisville Railway in its long fight for an increased fare. The Court of Appeals affirmed the action of Judge Walter Evans, of the United States District Court, in granting a temporary injunction to the company in February, 1921, preventing the city of Louisville from interfering with the collection of a 7-cent fare by the company. The company argued that a 5-cent fare was confiscatory, while the city argued that the franchise contracts called for a 5-cent fare.

The higher court returned the case to the district court with the suggestion that changes be made in the enjoining order, and fares be reduced if it can be shown that there has been a reduction in operating expenses which would warrant such action.

This leaves the status as regarding the public the same as when the temporary order was issued fifteen months ago. For the present the company will continue on a 7-cent fare basis, and issue the receipt check for the extra charge of 2 cents.

RECOMMENDS DISTRICT COURT HEAR CASE

The upper court refused to disturb Judge Evans' decision, but recommended that the case be heard in the local or district court on its merits as soon as possible. This will probably not be for some time, as the mandate of the upper court will not be sent to the district court for thirty days.

The principal question before the Court of Appeals was:

Is the company limited by an enforceable contract to a 5-cent fare or is there no such existing contract? The controversy grew out of the situation thus created.

The court ruled on this point as follows:

> It follows, we think, from the conclusion that the rate contracts were not extended by the ninety-nine year extensions of the railway charters, and the company, which is lawfully occupying the streets under legislative authority therefore, is not bound by a rate of fare, in fact, confiscatory, but has the right to invoke relief against the enforcement thereof.
>
> The evidence introduced by the company made a *prima facie* showing of a confiscatory rate, justifying judicial discretion in favor of the order of the court.
>
> We think the interests of both the company as well as the public, generally, will be best served by giving immediate opportunity for fully trying out the merits of the claimed confiscation.

The court said regarding charters of the group of small railways which were merged and consolidated so as to form the present Louisville Railway:

> After mature consideration we are of the opinion that whatever may have been the effect of the original rate contracts with the city, either alone or as affected by the (state) statute of 1856, or of the acceptance by the company of the constitution of 1891, such rate contracts were not extended by the act of 1886, and had expired before the present controversy arose.

It is very probable that the argument will be prolonged concerning the value of the lines and property and necessary earnings.

J. P. Barnes, president of the Louisville Railway, on May 4 made a statement to the press in which he said:

> The decision means a guarantee of good service to the city of Louisville. We will be able, after proving our value in the District Court, which we can now proceed to do, to arrange for necessary funds so as to provide improvements and equipment which has long been needed, and to rehabilitate certain portions of the property so as to give Louisville the 100 per cent service to which it is entitled and which has so long been the ideal toward which we have been striving.

BETTERMENT PLANS DEFERRED TEMPORARILY

Plans of the company for improvement will not be undertaken until the matters in hand are threshed out in the district court, and the company knows exactly where it is.

The company's contention as restated by the court in the course of its decision follows:

> 1. That no valid and enforceable rate contracts were effected by the charters of the respective railways and the amendments thereto, and the ordinances and contracts made between the companies and the city for the reason, among others, that such contracts were beyond the powers of the city and whether or not they are affected by the Act of 1876, which act, however, the company contends, of itself prevented a suspension by contract of the rate-making power.
>
> 2. That even if such asserted rate contracts were orginally valid and enforceable all expired by their terms many years ago, their life not having been protected by the extension act of 1886.
>
> 3. That even if such contracts were originally valid and enforceable and even if validly extended under the act of 1886, they were abrogated by virtue of the Constitution of 1891, and its acceptance by the railway company through the reservation to the state of the rate-making power.

In its review of the situation presented with respect to the matter of the alleged contract the decision of the court was in part as follows:

> In view of the conclusions reached as to the non-existence of rate contracts, we think the interests of both the city and the company, as well as the public interests generally, will be best served by giving immediate opportunities for fully trying out the merits of the claimed confiscation.
>
> Upon this subject we of course can have no opinion, nor are we called upon to decide what steps are necessary to be taken affecting a new rate contract. Apart from the one question of law, which we have passed upon, the entire merits of the case are open to further hearing below.
>
> We may add what is of course obvious, that the court below may properly entertain and decide any application which the city may make to modify or vacate the existing injunction, whether based on a showing of lessened cost of operation or upon a fuller showing of the controlling facts than the city has yet had an opportunity to make or upon both; and that in the absence of further rate contracts, the injunction ought not to be continued in aid of any rate higher than reasonably necessary to meet temporary conditions as they may vary from time to time.

Five-Cent Fare Contracts Upheld

For the second time within eight months the Supreme Court has upheld the 5-cent fare contracts of the city of College Park and the town of Decatur with the Georgia Railway & Power Company, Atlanta, Ga. At the time of the first decision the company redeemed all rebate slips outstanding which were given to passengers to cover the 2-cent difference pending the final decision of the court.

When the State Railroad Commission allowed the railway to charge a 6-cent fare on its lines in Atlanta, the city of College Park and the town of Decatur objected to the payment of 6 cents on those lines on the ground that they possessed contracts which provided for a perpetual 5-cent fare. Later the fare in Atlanta was raised to 7 cents by the commission while the litigation of Dectaur and College Park was pending.

HIGHER COURT AFFIRMS DECISION

In Fulton Superior Court an injunction restraining the company from charging 7 cents was issued by Judge John T. Pendleton, but a supersedeas was granted allowing the company to charge the increased fare provided rebate checks for 2 cents were given to each passenger to College Park. In similar proceedings brought in the DeKalb Superior Court before Judge John B. Hutcheson, a temporary injunction restraining the company from charging a 7-cent fare was granted. Judge Hutcheson, however, declined to grant a supersedeas permitting the company to charge 7 cents pending a decision of the Supreme Court.

Both interlocutory injunctions were appealed to the Supreme Court by the railway. The Supreme Court affirmed the decisions of the lower court and under the decision the company had the right to accept the decision or to demand a trial by jury. In order to appeal the case to their United States Supreme Court, if desired, it was necessary that company obtain a verdict from a jury and also a final decision in the Supreme Court, and it was for this purpose that the case was carried to the Supreme Court the second time. This controversy has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

"Bringing In" Customers

What is considered an innovation in selling campaigns was put into effect in Houston, Tex., upon two different occasions with success and promises to continue as a medium of stimulating sales. In order to bring customers into its store—literally speaking—the Foley Brothers Dry Goods Company chartered extra electric cars on each of the eleven lines to carry free of charge all those who cared to make the trip to the city. The event was the weekly "Dollar Day," when one dollar bargains were the chief attraction.

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Hearings on Five-Cent Fare Concluded

The public hearing before the Dallas City Commission on a proposal to order the Dallas (Tex.) Railway to restore a 5-cent street fare in Dallas was concluded recently. Members of the City Commission took the proposal under advisement, and it was not indicated when a decision would be rendered, nor whether the traction company would be permitted to charge a 6-cent fare or would be ordered to restore the 5-cent fare. The hearing came to a sudden and unexpected conclusion, after having occupied more than two weeks, during which time the financial standing of the Dallas Railway, its earnings and expenditures for the last several years, and other questions bearing on its earnings and earning capacity were considered.

The hearing was ordered by the City Commission when it was disclosed that the Dallas Railway directors were paying out in dividends claimed to have been earned in previous years the surplus earned under the 6-cent fare in excess of the authorized 7 per cent on the invested capital. The city claimed the traction company had been granted the 6-cent fare under the agreement that all surplus earnings would be used in street paving along its tracks, and that this agreement had been violated. It was found that more than $100,000 had been paid out in past-earned dividends from the excess earnings of the company.

Joe A. Worsham, attorney for the company, presented a short resumé of the points brought out in testimony during the hearing as the final feature of the session. He said that the company did not want to be placed in the position of appearing to make threats or of antagonizing the city officials in any manner.

The statement of William M. Holland, president of the Dallas Railway, that he believes the corporation stockholders will return the $110,000 taken from the surplus reserve and applied to unearned dividends, if the city officials will retract their charges that the company broke faith with the city in the disbursal of the funds, was the outstanding feature of the all-day session of the franchise hearing at the City Hall.

Since this is the issue about which the hearing was called, the city claiming that the company breached faith in not using the money for improvements and extensions, it is believed that the differences between the company and the city will be compromised and that some definite understanding will be made as to the disposition of the surplus in the future. Mr. Holland, however, stressed the fact that he would not commit the company on any matter until he had discussed the proposal with A. S. Grenier of New York, who has already figured in the hearing, and with the company's stockholders.

In reply to a question from Mayor Aldredge as to whether the $110,000 would be returned to the treasury, Mr. Holland said he did not think the stockholders of his company would contradict their previous decision as to the use of that particular sum.

The Commissioners expressed themselves variously concerning Mr. Holland's proposal. Finance Commissioner Blaylock characterized it as a reasonable one, and stated that a clear avenue to an understanding had been opened.

Jitneys Eliminated—Railways to Consolidate

Jitneys were emphatically turned down by citizens of Spokane, Wash., in favor of the electric railway at a special election held on May 2. The vote was 15,495 to 7,204. The charter amendment now approved will eliminate jitneys on Dec. 31, 1922, and make possible the consolidation of the local railway lines of the Spokane & Eastern Railway & Power Company and the Washington Water Power Company.

Application for a franchise to run for twenty-five years was made by the Spokane United Railways, the successor company under the consolidation, on May 5, three days after the election. This franchise was given its first and second readings at meeting of the City Council on May 8. The new company will take over trackage and equipment of both the Washington Water Power Company and the Spokane Traction Company, included in the system of the Spokane & Eastern Railway & Power Company. Parallel lines are to be eliminated according to the agreement reached with the City Council prior to the election. A 6-cent ticket with universal transfer is to go into effect on June 30 in place of the present 8-cent fare and no transfers between the two systems. Details of the jitney-railway controversy were outlined in the ELECTRIC RAILWAY JOURNAL, issue of April 15.

Recommends Car Ownership on Basis of Car Miles Run

That it will be necessary in order to get an exact distribution of fares on the interurban lines between Minneapolis and St. Paul to put in two fare boxes is a conclusion in the report of Delos F. Wilcox, valuation expert to the City Council. At present fares are collected on entrance in either city where cars are bound out and on exit on cars bound in, the same Johnson box being utilized in both instances.

He also concludes that the interests of the Minneapolis car riders will be protected if the State Railroad & Warehouse Commission in the distribution of these fares, now a subject of controversy between the two cities as to the proper allocation of expense of operation charges, will assign the ownership of the street cars on the basis of car miles run, or on the basis of the present property tax listings. He said the cars on the Twin City Rapid Transit system number 1,030, of which 572 are allotted to the Minneapolis Street Railway and 425 to St. Paul, 33 being assigned to the suburban company.

Reduced Fare Fight to Be Pushed

The fight for reduced fares in Fort Worth, Tex., will be pushed, and hearings before Judge N. A. Dodge, referee, will likely begin at an early date, according to R. E. Rouer, corporation counsel for the city. Fort Worth had dropped the fight pending settlement of the Galveston fare case, and now that the United States Supreme Court has upheld the 5-cent fare in that city, Fort Worth officials are ready to press the fight for reduction in fares in Fort Worth. The Northern Texas Traction Company has been collecting a 7-cent fare for more than a year despite all efforts of the city to force a reduction. George H. Clifford, vice-president and general manager of the Northern Texas Traction Company, has expressed a willingness that the questions of earnings of the traction company be gone into thoroughly. He says the traction company is ready to cut fares if it is found that earnings under the 7-cent fare will warrant, but declares that a cut can only be made at the expense of service, that if fares are reduced, service must be curtailed proportionately.

The hearings before Judge Dodge as referee in the Fort Worth case were begun under a former city administration, but the matter was permitted to remain in *statu quo* pending settlement of the Galveston case, as it was admitted that the issues in the two cases were almost identical.

Low Fare Measure Reappears

Rejection of the Erickson electric railway tax scheme at Seattle, Wash., has brought discussion of a 5-cent fare to the forefront of city affairs. As noted in the ELECTRIC RAILWAY JOURNAL for May 6, Mr. Erickson had proposed that the Seattle Municipal Railway be operated at a 3-cent fare and that any deficit in operation be met by taxation.

E. J. Brown, the Mayor-elect of Seattle, has pledged himself to a reduction in fare and two of the new members of the City Council are publicly pledged to work for a reduction.

It was estimated that the Erickson plan would have added $5,000,000 to the city tax levy, or nearly double it, with the consequent discouragement of new industries, and business building.

As a matter of fact the Erickson bill was erroneously called a "3-cent" fare proposition. Mr. Erickson's proposition did not state any specified fare. Councilman E. J. Erickson, father of the bill, estimated that with only the costs of betterments and extensions and payment of interest and principal out of the receipts of the lines, a 3-cent fare could be established.

There is now a clamor in the city for a reduction in fare, and a feeling that a 5-cent fare could be re-established. It has been announced that immediately after the new Council meets in June, a bill will be introduced providing for a 5-cent fare.

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Personal Mention

C. M. Benedict Leaves Charleston for Des Moines

Clarence M. Benedict, vice-president of the Consolidated Railway & Lighting Company, Charleston, S. C., has resigned to take up new work as vice-president of the gas company at Des Moines, Iowa. Mr. Benedict has been associated with the Charleston company for twelve years, first as assistant secretary and assistant treasurer, and since 1917 as vice-president. He has also been general manager.

There was a banquet in Charleston in honor of Mr. Benedict and E. C. Stothart, commercial agent of the company, who is also taking up work elsewhere. Employees of the company, who enthusiastically acclaim Mr. Benedict's powers, presented to him a watch. At the banquet it was made evident what a strong hold Mr. Benedict had gained in the interests of the company, the employees and the residents of the city.

Mr. Stuart Cooper will take Mr. Benedict's place. He was recently elected a vice-president of the company. Mr. Cooper has been with the Charleston Consolidated for several years. F. A. Bailey was recently made superintendent of transportation.

C. A. Brann Studies to Please the Public

Giving the public what it wants, the ethics of which in the newspaper world has been argued since papers were first published, is to be the sole task of Charles A. Brann, head of the newly created traffic department of the Houston (Tex.) Electric Company. In the railway field there is no question of ethics attached to giving the public what it wants. Every company wants to do it. Every company strives to do it. The degree of success depends on how accurately it knows those wants.

This is the conviction of Mr. Brann, who is to find out what the public wants, then give just that.

Mr. Brann proposes to accomplish his work by talking before the clubs of the city. The company has invited all associations to have Mr. Brann discuss their service needs with them. The Parent-Teacher associations and the civic improvement clubs will be interviewed first. Thus the needs of individual sections of the city will be taken care of and the general transportation conditions built up as well. Mr Brann believes that if he takes the riders into the company's confidence both rider and company will profit.

Mr. Brann was formerly claim agent of the El Paso Electric Railway.

C. R. Firth has been appointed freight agent of the Fast Freight Line of the Public Service Railway, Camden, N. J. His headquarters are at Trenton. Mr. Firth was formerly traffic manager of the Charles Beck Company of Philadelphia, and has had long experience in the freight business.

W. H. Forse Resigns

Has Been Secretary and Treasurer of the Indiana Traction Company for Fifteen Years

After fifteen years as secretary and treasurer of the Union Traction Company of Indiana, Anderson, Ind., William H. Forse, Jr., has resigned. The resignation will take effect June 1, and thereafter Mr. Forse will devote his time to his other business interests, which include a manufacturing company in Anderson. His successor has not yet been named.

W. H. FORSE

The name of Mr. Forse suggests immediately electric railway auditing and accounting and brings to mind his continuous efforts to clarify and standardize the accounting methods of interurban railways. As early as 1907, when he was selected as one of three accountants to devise a system of accounting for interurban railways by the American Electric Railway Accountants' Association, Mr. Forse showed that he had developed methods and ideas which could not help but effect an advantageous accounting change when applied.

That he had theories and ideas and could expound them convincingly to others was plainly evident, for he was later appointed the representative of all interurban railways on the committee of five accountants, all members of the Committee on Standard Classification of Accounts, who worked to devise a system of accounting for railways under the jurisdiction of the Interstate Commerce Commission. The commission refers all questions to this committee. Mr. Forse has been a member since its formation.

It was only natural that Mr. Forse, with his highly specialized knowledge, should be elected as president in 1910 of the Central Electric Railway Accountants' Association and in 1910-1911 as president of the American Electric Railway Accountants' Association.

Mr. Forse has long been author of articles on depreciation, sinking funds and other technical subjects, but, like the guest who wasn't satisfied until he had "a leg, a wing, a thigh, and a piece more" of the chicken, Mr. Forse wasn't satisfied until he had done even greater things. He thereupon wrote "Electric Railway Auditing and Accounting," to appease that hunger for working hard and accomplishing results. This book, published by the McGraw Publishing Company in 1908, spread Mr. Forse's reputation a bit farther and intrenched him a bit deeper in the electric railway world.

While doing all these things, Mr. Forse was actively carrying on his duties with the Indiana Traction Company. He began his work there in 1903, and in 1906 was made auditor. The next year came his election as secretary and treasurer.

J. E. Cochran, for eighteen years superintendent of lines and stations on the Ohio Electric Company, Springfield, Ohio, has resigned.

Peter M. Miller, assistant treasurer of the Jacksonville (Fla.) Traction Company, has resigned to accept a similar position with the Eastern Texas Electric Company at Beaumont. Both the systems are under the management of the Stone & Webster Corporation.

Preston S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, has been selected to deliver one of the four main addresses before the international convention of Rotary Clubs at Los Angeles, Cal., June 4 to 10. Mr. Arkwright will speak on the afternoon of June 8. His subject is "Business—The Rotarian's Opportunity to Serve Society."

Obituary

R. C. Leeper, superintendent of the Reno (Nev.) Traction Company, died April 27 in San Francisco, Cal.

Edward B. Cramp, who was on the staff of the Interborough Rapid Transit Company, New York, N. Y., for many years, died some time ago. He retired from active work with the Interborough company five years ago.

Robert C. Maxwell, 67 years old, retired president of the Cincinnati (Ohio) Railway Supply Company, died in Cincinnati, April 5, after a lingering illness. He retired from active business life ten years ago. Mr. Maxwell was a brother of Lawrence Maxwell of Cincinnati, an attorney, who was Solicitor-General under the administration of President Grover Cleveland.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

American Exporters Are Unduly Alarmed

German Competition in South America Not Dangerous—Feeling Toward United States Improving

While South Americans do trade with Germany, they have experienced many disappointments connected with late deliveries, inferior material, and, recently, by increases in invoice values of accepted prices, according to F. de St. Phalle, vice-president of the Baldwin Locomotive Works, in charge of foreign sales, at the ninth national foreign trade convention in Philadelphia on Thursday. This, he declared, tends to bring about greater consideration and better feeling toward the United States.

"The future holds out bright prospects for South America and for the United States," said Mr. de St. Phalle. "South America will develop at an increasing rate because it is the most attractive and richest of the thinly populated sections available. In addition to the future development of South America being greater, a larger proportion of this development will be financed and carried out with the assistance of the United States. Economic factors governing the movements of exchange are now better understood in South America and the many loans recently issued from New York to South American countries, coupled with the rising tendency of exchange, have greatly improved the feeling. In the future South America looks to increasing growth carried out to an increasing extent with the assistance of American financial, engineering and business co-operation, all of which is being prepared for at this time.

"With the general recovery of trade, South American exchanges may be expected to rise; some of them have already done so materially. The Argentine will unquestionably return to gold exchange within a comparatively short time."

Mr. de St. Phalle does not believe that everything connected with the United States export trade to South America has been poorly handled; on the contrary, he thinks that great progress has been made and will continue to be made. South America, in his opinion, offers the best field for exportation for the United States today and should receive the most careful consideration of exporters. A notable rise in wealth and efficiency is taking place there now. The future is exceedingly bright but cannot be taken advantage of without hard and efficient work on our part. Purchasers in South America know their business and expect service. They know good service when they receive it, and a good healthy business can be built up on the basis of faithful service just as it has been done in the United States.

Illinois Central Raises Funds to Electrify

The Illinois Central Railroad asked the Interstate Commerce Commission today to authorize the issue by it of $10,929,000 in preferred stock, which it will sell to procure funds for beginning electrification of its lines in and around Chicago. The total cost of the work, which the railroad has decided to put under way, the application said, will be $86,000,000, a part of which will be financed by preferred stock issues and the balance taken from earnings.

Copper Price Advances

Copper displayed a firmer tone in the market and leading producers advanced their price to 13¼ cents a pound, the highest price reported in several months. The high record of this year was 13§ on Jan. 3. The advance bears out predictions of last week that, as soon as all the 13-cent metal held by small dealers was disposed of, there would be a hardening of prices. Producers expect the price to reach 15 cents or more before the turn of the half year.

Large Wood Preserving Company Organized

Organization of the Baker Wood Preserving Company of Washington Courthouse, Ohio, was completed the first of May with the incorporation of the company for $300,000. The company, which was formed for the purpose of purchasing, creosoting and selling ties, piling, lumber, etc., is headed by C. E. Baker, who is also president of the Springfield & Washington Railway, operating between Springfield and South Charleston, Ohio. The other officers are: Will E. Dale, vice-president; Langford Johnson, secretary-treasurer, who with M. S. Daugherty, J. M. Baker and Attorney N. P. Clyburn comprise the board of directors.

The company already has on hand orders to keep the plant operating at capacity for several months. The plant at Washington Courthouse covers fifty-five acres of land, of which fifty-one acres are devoted to storage. It has also contracted for extensive timber acreage in southern Ohio and Kentucky. It is expected that more than a million ties will be handled by the company during its first fiscal year. It was necessary to install 6 miles of track to take care of the switching which will be necessary around the plant.

The company purchased a huge metal treating tube from the Worthington Pump and Machinery Company of Cudahy, Wis., which will be used in the treatment of ties. This tube is now being installed. Some idea of the size of the tube may be gleaned from the fact that it required four flat cars for its transportation in one section from Wisconsin to Ohio. The giant tube is 144 ft. long and 7 ft. in diameter and weighs 175,000 lb.

The tube has a capacity of 1,400 ties in eight hours. The ties are loaded on sixteen tramcars and pushed into the tube, which is then sealed. Five thousand gallons of creosote oil is then turned into the tube under pressure of 200 lb. The oil is kept at a temperature of 190 to 196 deg. It requires four hours for the complete treatment of "each batch." Storage tanks with a capacity of 250,000 gal. of creosote oil have been erected on the company's property.

American Equipment for France and Italy

Copper and electrical manufacturing companies are expected to profit measurably by the decision of the managements of leading French roads as well as some in Italy to electrify their lines. Owen D. Young, vice-president of the General Electric Company and chairman of the Radio Corporation of America, returned this week from abroad with considerable information on those plans. Practically all of the new rolling stock of French roads will be electric, he said, and the Paris & Orleans has recently placed an order for about $14,000,000 of electric locomotives and other equipment, a portion of which will go to the Westinghouse and the General Electric companies. Italy, he said, is making rapid strides in that direction and is converting her water power into electrical energy as never before. Copper men are particularly gratified by that development because of the huge copper surplus in this country a year or so ago; a large proportion has since been sold and most of the remainder is in the hands of the Copper Export Association for shipment abroad.

Metal, Coal and Material Prices

Metals—New York	May 9, 1922
Copper, electrolytic, cents per lb.	13.00
Copper wire base, cents per lb.	5.25
Lead, cents per lb.	4.90
Zinc, cents per lb.	5.387
Tin, Straits, cents per lb.	30.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.625
Somerset mine run, Boston, net tons	3.375
Pittsburgh, mine run, Pittsburgh, net tons	1.85
Franklin, Ill., screenings, Chicago, net tons	3.00
Central, Ill., screenings, Chicago, net tons	2.00
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.75
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	96.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	92.00

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Rolling Stock

Portland-Lewiston Interurban Railway, Lewiston, Me., has now on order two WH304 railway motors complete for spares and one Sheffield-40 motor section car.

The Interstate Public Service Company, Indianapolis, Ind., recently ordered from the American Car & Foundry Company three box cars which will be used to take care of additional freight business.

Interstate Public Service Company, Indianapolis, Ind., has placed orders and equipment is in process of construction for five double-truck, single-end, one-man safety cars weighing 24,000 lb. each; also for six new stock cars and fifteen new box cars of 60,000 lb. capacity each.

Georgia Railway & Power Company, Atlanta, Ga., recently placed an order for twenty forty-eight-passenger double-truck cars which can be used for either city or interurban service. They are equipped with multiple-unit control. The trucks have 26-in. wheels and the equipment comprises four 35-hp. motors. All of the trucks and ten of the bodies are to be furnished by the McGuire-Cummings Company, Chicago, and the remaining ten bodies will be built by the Cincinnati Car Company.

The Elevated Railroads, Chicago, Ill., are planning to purchase 100 new cars for use on the various lines. These will probably be of an all-steel design, very similar to the 250 arch-roof steel cars purchased in 1914 and 1915. Bids have been asked for on these cars, though their actual purchase is probably contingent upon a consolidation of the several elevated companies into a single corporation, for which a petition to the Illinois Commerce Commission was made on May 2.

Track and Roadway

Portland-Lewiston Interurban Railway, Lewiston, Me., is now engaged in raising the grade of the track an average of 12 in. for a distance of about four miles.

Interstate Public Service Company, Indianapolis, Ind., has placed orders for 1 mile of new 80-lb. A.S.C.E. Section T-rail with angle bars complete and for special track work amounting to $4,108.

Toronto (Ont.) Transportation Commission was scheduled to begin on May 8 the rehabilitation work on the section of Bloor Street between Spadina on the east and Ossington on the west. King Street between Church and York was to be thrown open to traffic on May 9.

Worcester (Mass.) Consolidated Street Railway is planning to start shortly on the replacing of rails and the general overhauling of the road bed on various lines along its system in Worcester. Its own "gang" will do the work, which will cost about $200,000.

Brooklyn (N. Y.) Rapid Transit Company is working on the reconstruction of the Jamaica Elevated Line between Alabama Avenue and Cypress Hills to permit the operation of trains made up of the subway type of cars on the Jamaica line east of Alabama Avenue.

Hannibal Railway & Electric Company, Hannibal, Mo., has received permission to remove its tracks from St. Mary's Avenue and has been granted a new franchise to extend its lines to within 5 ft. of the city limits on Pleasant Street over a new route. The new line starting from Chestnut Street and Lamb Avenue will practically parallel St. Mary's Avenue a block south and west.

Savannah (Ga.) Electric Company, to give better service and to enable the Daffin Park crowds to be handled more efficiently, will construct 1,400 ft. of track on Ott Street from Anderson to Thirty-fourth Street and thence to the present track on Waters Road. This will provide virtually a double track between Ott and Anderson Streets and Thirty-fourth and Waters Road. This construction work will start very soon, together with work on Bay Street in preparation for the paving work contemplated there.

Power Houses, Shops and Buildings

Portland-Lewiston Interurban Railway, Lewiston, Me., has recently purchased and is now installing one 500 kw. railway synchronous converter, 600 volts d.c., and the complete station equipment for its operation.

Texas Electric Railway, Dallas, Tex., has opened its new interburban depot at Van Alstyne, Tex., which was erected to take the place of the station destroyed by fire on Dec. 24, 1921. The new station is of brick, considerably larger than the former building.

Union Street Railway, New Bedford, Mass., has let the contract for the installation of a large turbo-generator unit converter and condenser in its Harbor Front power plant. The turbo-generator will have a capacity of 2,500 kw., and the converter will have 2,500 kw.

Los Angeles (Cal.) Railway will tear down its two-story brick building at Division 1 which housed the first electrical equipment of the system. The space will be used for storage track. Additional trackage will be laid to relieve congestion which has been a problem at the Division 1 carhouse for some time. Tracks and switches will be arranged so that cars will pull in and out from Central Avenue.

Baton Rouge (La.) Electric Company has announced plans for the installation of a 1,500 kw. unit at an estimated cost of $180,000. The present capacity is 1,500 kw. Approximately $34,000 will be spent for miscellaneous short extensions to the gas and electric meters. Improvements will also be made at the power station and gas plant. The construction program for 1922 amounts in all to approximately $250,000.

Northern Ohio Traction & Light Company, Akron, Ohio, has announced that it will start at once to increase its power and light production and distribution facilities, at a cost of approximately $175,000. A three-phase primary circuit will be installed in the West Hill district, a feeder will be added to the South Akron station, and the Kent power feeder will be extended from Monroe Falls to Kent. Underground conduits are also to be installed.

Franchise

Texas Interurban Railway, Dallas, Tex., has been granted a franchise to build its line entering the city of Dallas either on Forney Avenue or on Second Avenue. The Forney Avenue route was asked by the Dallas Railway while the Second Avenue route was asked by C. W. Hobson for the interurban company. The interurban company officials asked for the route on Second Avenue with a view to using the tracks of the Dallas Railway already on that street, while the officials of the Dallas Railway wanted the interurban to build its line on Forney Avenue and then to lease its tracks to the local traction company for street car service.

New Incorporation

West End Terminal & Railway Company, Cincinnati, Ohio, was recently incorporated with a capital stock of $10,000. The incorporators are H. Lee Early, Morgan Wamsley, Louis B. Patterson, John H. Walton and Milton Sayler. Elsewhere in this issue details of the plans of the company are given.

Trade Notes

Track Specialties Company, New York, N. Y., has announced the appointment of W. B. Mallette as agent in the territory of St. Louis, Mo. He will be located at 3883 Wyoming Street, St. Louis.

Poughkeepsie Paint Company, Inc., has been reorganized with John L. Hinkley, president; Frank B. Lown, vice-president; Charles A. Brooks, treasurer, and John A. Nilan, secretary. This company will push the sale of "Filkote," which is a sanding filler well adapted to car painting.

Economy Electric Devices Company, Chicago, Ill., is furnishing a graphic form No. 341 which is used for plotting data and statistics. The sections provide for five co-related curves or groups of curves by months for five years and so separated as to facilitate comparisons and ready analysis. The sheet is letter-size and will blueprint.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Getting to the Real Source of Good Service

THE basic reason why railway managers take such keen interest in educational work is because they realize this fact: Assuming that he has good health, an employee's usefulness depends on his competency of head and hand. The first step in securing competency is to select intelligently among available prospects; the second is to train employees to do their work better.

Assuming that employees have been well selected, what next? Here is where practice differs, and where it lags behind precept. Some companies devote attention to education systematically, even going so far as to employ a director of education. Others are bewildered by the magnitude of the job and do not know where to begin. Still others are in between these extremes. There is need of a formulation of educational principles for the convenience of all railway companies, so that they may take account of stock, educationally, and lay their plans accordingly with due regard for local conditions as well as general principles which are involved.

The need for such a syllabus of the subject the committee on education of the American Association will attempt to meet this year. The committee finds that there are three fundamental requirements of a program: First, present non-technically trained employees should be under training; second, provision should be made for trade apprenticeship, and, third, co-operation with technical schools should be fostered to provide a supply of specially trained recruits. Much is being done already along these lines, but, compared with the magnitude of the electric railway industry and the urgency of the present and prospective need for more and better directive talent, the progress made so far is small.

Canadian Association Expanding Its Activities

THE program for the Quebec meeting of the Canadian Electric Railway Association, which occurs early next month, marks a forward step in the progress of this virile organization. Arrangements have been made to display in adequate fashion the exhibits of the associate members of the association, the exhibit space and furnishings for the spaces being donated. The exhibits are to occupy in many ways the place of honor at the convention, the theory of the management being apparently that nothing better can be done for the industry than to call attention to its physical achievements.

Last year the association welcomed to its Ottawa meeting representatives of the manufacturing industry, and the result was highly pleasing to the railway's representatives. In fact, it is not too much to say that they were delighted with the contributions to the discussions and to the good fellowship of the convention which were made by the erstwhile outsiders. The outsiders are such no longer, but now form an integral part of the association.

The Canadian Association has a problem which is quite distinct from that of the American Electric Railway Association, in giving unity to an industry in which there is a strong leaning toward municipal ownership and operation. Further, its constituents are distributed through a territory of magnificent distances east and west. Compared with the American Association the Canadian Association is small, and probably always will be, but the necessary limitation on its size is compensated for by intensity of interest in countrywide transportation problems.

The Bacharach Bill— Pro and Con

THE Bacharach bill now before the House judiciary committee is attracting more than passing interest from various classes of people. At the next hearing on the bill, scheduled for May 23, Mayor Thompson of Chicago will make his "appearance," following the lead of his "presidential timber" friend, Mayor Hylan of New York City, who presented his arguments on April 25.

Naturally the public utilities are interested in this bill, whose effect would be to impede them in efforts to protect their investments when threatened. The bar and the judiciary of the country are also interested because they see that it opens up some very fundamental legal and constitutional questions. The public service commissions at first favored the bill for it ostensibly strengthens their positions, but on more mature deliberation most of them probably realize that it would impede utility development. State politicians sense another "State's rights" question. And the local politicians of a utility baiting nature see in the hearings being held an opportunity to gain a little more publicity for their rantings.

A good deal of talk about this bill has been going on without there being a very clear conception of its provisions or of the arguments pro and con. What it aims to do is to remove from the jurisdiction of United States district and circuit courts all cases involving public utility rates; in other words, these courts could no longer claim jurisdiction in injunction proceedings or otherwise in rate cases or orders proceeding from public utility commissions or state courts. Such cases would be restrained from following any other course than that specified in the particular state in question. Appeal naturally could be had finally to the Supreme Court of the United States on questions of law, but this would admittedly limit the determination of all questions of fact to state courts, for appeal to the United States Supreme Court may be made on questions of law, *i.e.*, of error of procedure, only.

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As regards the general purposes of the bill, those who favor it argue that rate making is a state legislative function and that the present action of Federal courts in granting injunctions against utility commission orders in rate cases defeats the purpose of all state efforts along such lines. Furthermore, that by their assumption of jurisdiction on questions of fact, they cause cases to be all gone over again, refusing to act on records made before state courts and commissions, but starting each case *de novo*, thus causing double cost to the state for the litigation.

Those who oppose the legislation have made no particular effort to present a definite case, but William Chamberlain of Cedar Rapids, Iowa, on March 28 and William L. Ranson of New York on April 25 offered some forceful arguments against the bill. Others have also appeared, but the statements of these two were particularly clear. The time which would necessarily be consumed in getting any relief from a confiscatory commission order, following the procedure of the bill, would be very great, it was argued. This would frequently be so serious that the utility would fail during the litigation. With this sort of a condition facing utilities, money for necessary development would be almost impossible to secure.

But most important are the legal and constitutional questions involved, and it was to these points that Mr. Chamberlain devoted most of his attention. The bill, it is claimed, would be unconstitutional for it would seem to prevent the operation of the "no confiscation" amendment of the Federal constitution. From the standpoint of the company, its only interest in Federal court procedure is that it knows the Federal court is there, in case of necessity, to enforce this constitutional provision upon which safety of investment rests. Proponents of the bill say that this duty of enforcing no confiscation would merely be transferred from Federal court to state court, but the opponents point out the extremes to which such a theory might lead if applied to other classes of cases.

In the testimony and cross-questioning on these particular features of the bill, a number of most interesting facts were brought out with reference to the function of the inferior Federal courts and their history from early days are traced. It was argued, on the one hand, that with the exception of the Supreme Courts they are the creatures of Congress and that Congress may define their jurisdiction; but the opposing argument shows the uselessness as well as the detriment of any such attempt. As Mr. Chamberlain says, while Congress may technically have the power to take such action, it does not have the right to do so.

It would seem that the most the Bacharach bill could do, if enacted, would be to cloud the issue and clog the machinery, for the only function of the Federal court in such cases is to prevent confiscation, and no Bacharach bill could actually nullify the constitutional provision in that regard.

Actually, the bill is based upon a fallacy. Of the total number of utility cases decided by commissions, an exceedingly small number only find their way, for any reason whatsoever, into the Federal court. This record is a commentary upon the effectiveness of commission regulation as now constituted and shows how seldom the right of appeal to Federal courts is even thought justified. The facts in the case will win in determining the recommendations of the judiciary committee and some of the best witnesses against the bill are some of the country's mayors who tell why they want it passed.

It is interesting to note in this connection the publication within the last few days by the New Jersey Utilities Association of a paper read at the November meeting of that organization by Ralph J. Baker of Harrisburg, Pa. Mr. Baker upholds in general the right of review by the Federal court and points out many of the legal limitations of state public service commissions.

National Chamber of Commerce Meets in Washington

SOME electric railway men may think that the meeting of the Chamber of Commerce of the United States at Washington this week is not of great concern to them because the general subject for consideration at the meeting was "European Conditions and Their Effect on American Business." At first sight it may be admitted that European conditions do seem to be pretty far removed from the business of local passenger transportation. Nevertheless, this is an incorrect view to take of the Washington meeting, for at least two reasons.

One of these is that the electric railway industry, perhaps more than any other, solicits patronage from every class in the community, so that it is very deeply interested in any matters which seriously affect their prosperity. This is so to such an extent that its gross receipts or their rate of increase may be considered as a gage of the average business conditions in the community which a company serves. Hence, questions like those which the National Chamber of Commerce has been discussing this week have an indirect but no less certain influence on electric railway prosperity.

A second, and perhaps more direct, bearing which the European situation has on electric railways lies in the fact that its problems are largely financial in character and so are bound to have their reflection on our own financial markets and to increase or decrease the rates which all borrowers here have to pay for money.

It is this intimate relation which electric railways have with business in general which makes it most appropriate for them to take not only an interest but an active personal part in all movements, both local and national, to improve general business conditions. This they can do probably in no more effective way than through their own local chambers of commerce, which are usually the centers of constructive business thought in their respective communities. By such participation they will not only help all lines of business, and consequently their own, but they will establish connections with the leaders in commercial thought in their own city which may be of help at a later time in their own problems.

It is only about two years ago that the National Chamber of Commerce, through one of its committees, gave a great deal of time and intelligent consideration to the problems of the electric roads. The report of this committee and the later referendum of the entire chamber helped to a clearer understanding by the public of the railway situation. This willingness of the Chamber to help in the best way possible—a study of the situation—should not and will not be forgotten by the electric railway companies in their future relations with the Chamber.

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Reclaiming Old Railway Motors at a Cost that Pays

Most Motor Failures Are Traceable to Mechanical Defects—The Jigs and Tools Used and the Operations Followed in Rebuilding Old Motors on a Quantity Basis Are Described

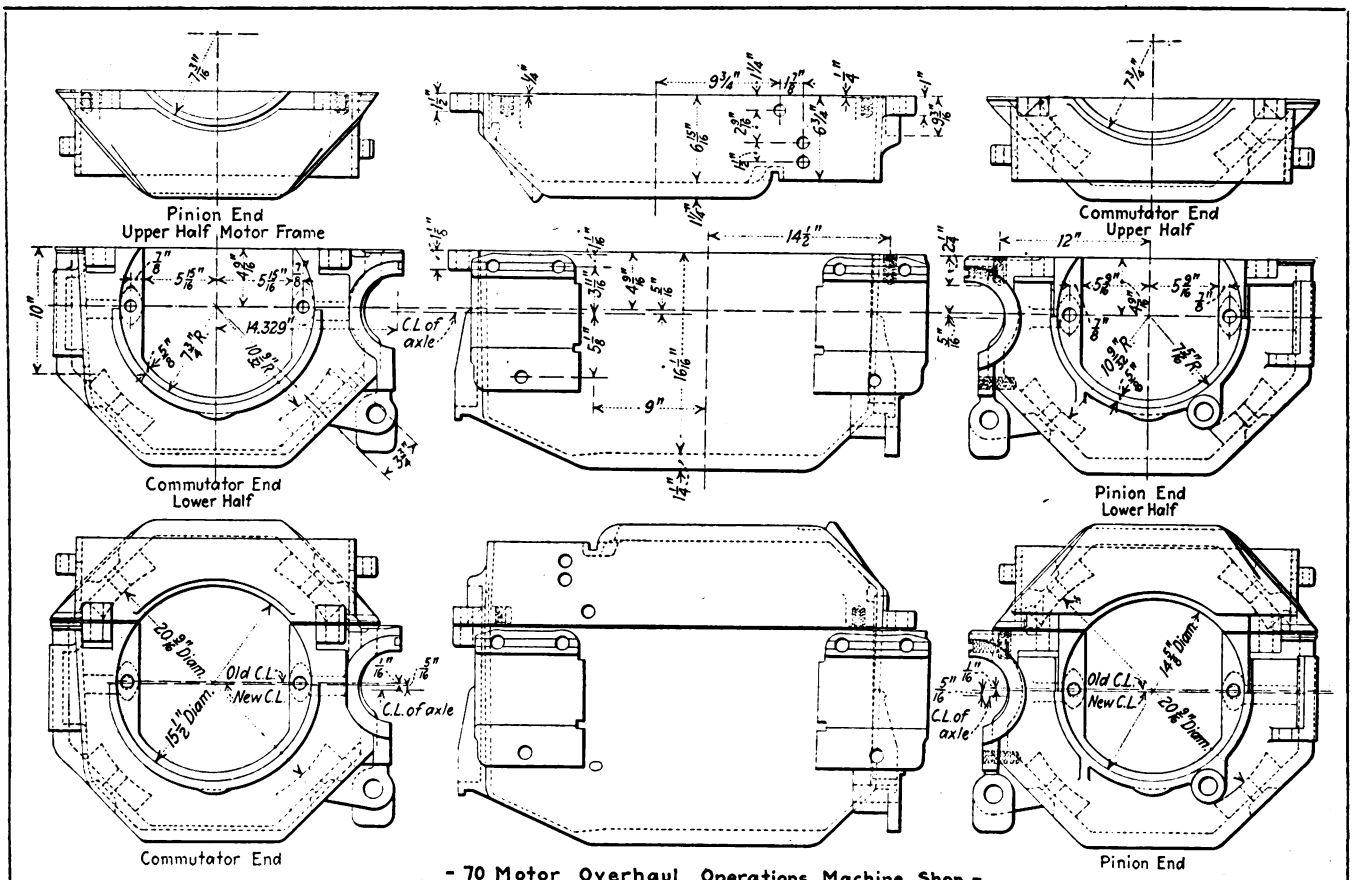
BY WILLIAM H. HAYNES
In Charge Mechanical Operations in Shop of Kansas City (Mo.) Railways

OVERHAULING and maintenance of electric railway motors is a very serious and expensive proposition if not done properly, especially on a system that has a number of different types of motors, some of which are very old and inefficient. Where designs have been changed or where different sizes of machined fits on the frames and bearings are used and not held to standards, the problem is further complicated.

A great many of the motor failures occurring on the road can be traced back to poor standards of machine work and poor fitting of the frame parts. One common fault is the improper fitting of the armature housing into the frame. This permits the housing to become loose and to wear both the housing and frame to such an extent that the armature will vibrate. This in turn causes sparking at the commutator, loosening of the brush-holders and, most serious of all, fractures of the coil insulation which are eventually followed by burnouts. In fact, most of the failures on old railway motors are traceable to mechanical defects of some description.

The financial condition of many electric railway systems at the present time does not permit of the purchase of new motors to replace the worn-out ones. The result is that motors are continued in operation which have reached the point of service where the failures are so frequent and the maintenance is so high that the question of just what procedure should be followed becomes very difficult to answer.

On a property where a comparatively large percentage of the total motor equipment is in a worn-out condition, the ordinary makeshifts of hand machine work, shimming, etc., will not take care of the failures. With that situation existing in Kansas City, it was believed that a complete set of jigs and fixtures could be designed so that a large number of motors could be completely remachined on a quantity basis at a cost per motor that would warrant the design and manufacture of the many



MACHINE WORK DONE IN RECLAIMING MOTORS, WITH STANDARDS AND PROCEDURE

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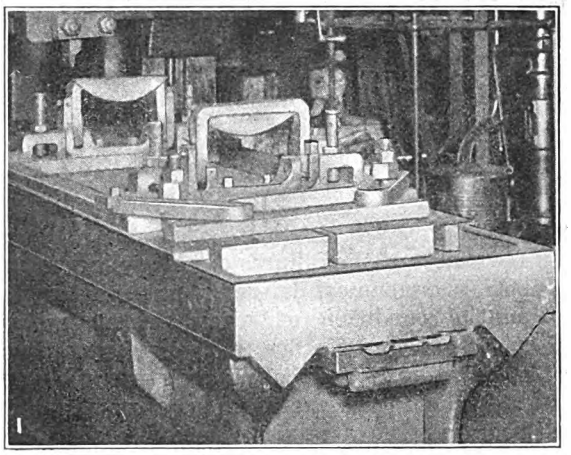
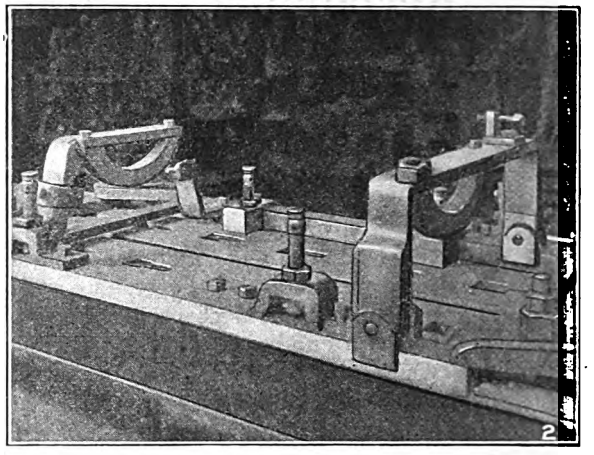
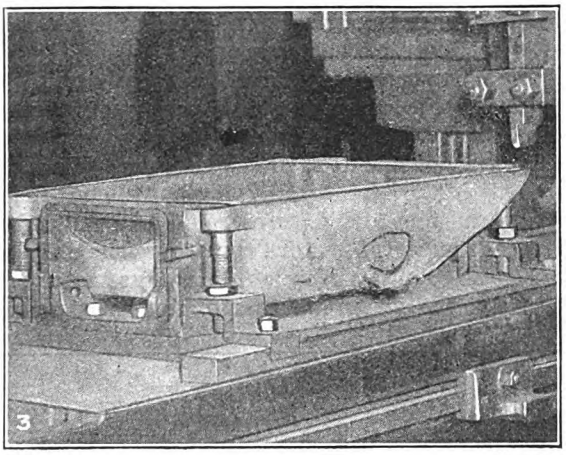
Jigs and Fixtures for Machining Motor Shells



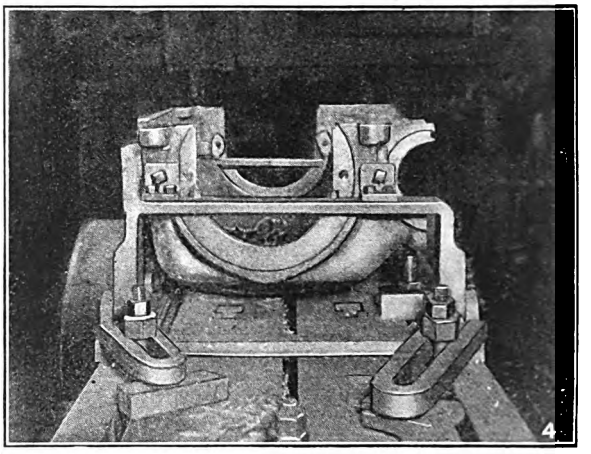
No. 1.
PLANER FIXTURE FOR MACHINING TOP HALF OF MOTOR FRAME



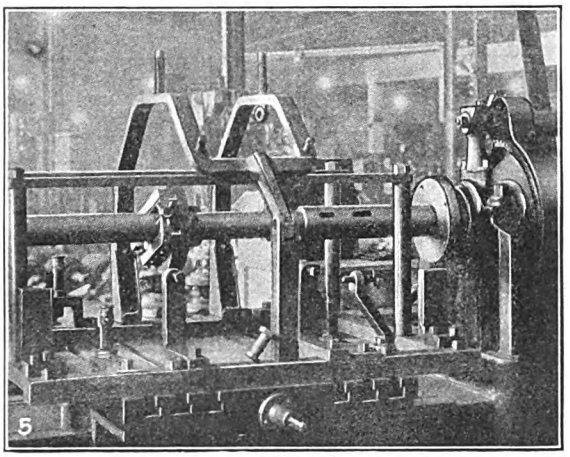
No. 2.
PLANER FIXTURE FOR MACHINING BOTTOM HALF OF MOTOR FRAME



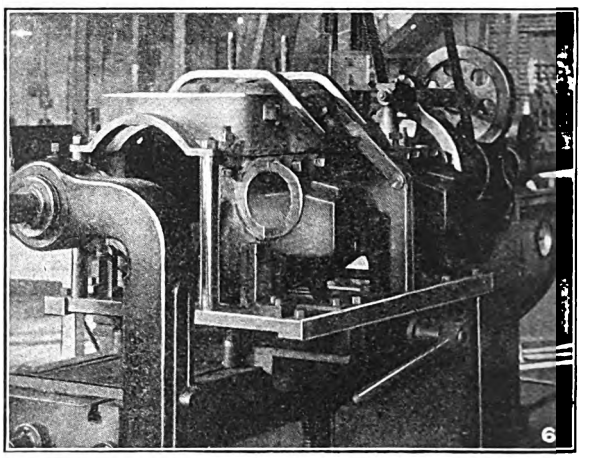
No. 3.
TOP HALF OF FRAME SET UP IN THE PLANER FIXTURE



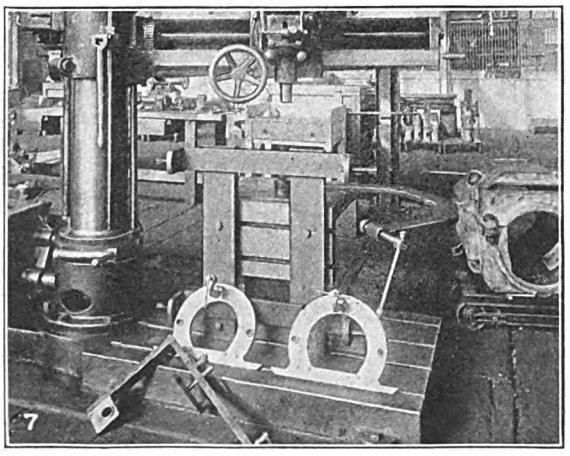
No. 4.
BOTTOM HALF OF FRAME SET UP IN THE PLANER FIXTURE



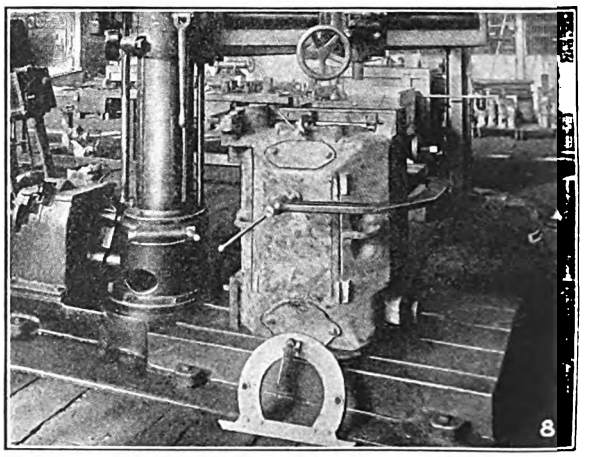
No. 5.
FIXTURE FOR MOUNTING MOTOR FRAME IN HORIZONTAL BORING MILL



No. 6.
FRAME SET UP IN BORING MILL FIXTURE



No. 7.
FIXTURES AND JIGS FOR REDRILLING HOUSING BOLT HOLES



No. 8.
FRAME CLAMPED IN PLACE READY FOR REDRILLING

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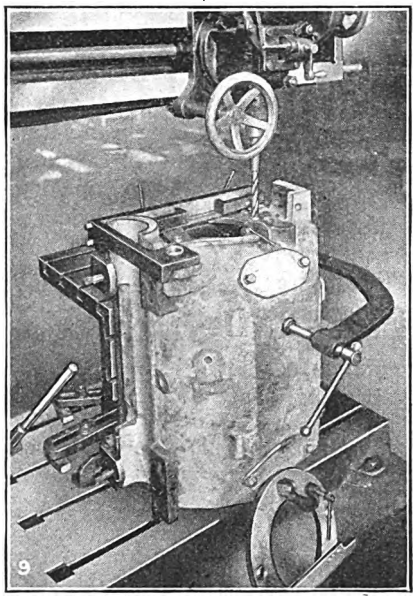
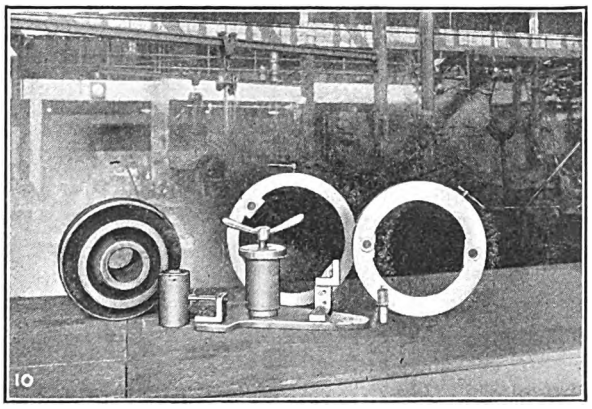
tools required in the various machining and finishing operations. In the particular instance in mind, the motors to be revamped were the G.E.-57, 67, 70 and 80 types. For the purpose of this article the writer will give the detail information as applied in the complete reclaiming and overhauling of an old type of motor, which was worked up and tested out and has proved to be in practically as good condition as when new. Of the several types worked on, the G.E.-70 motor will be used as the illustration, because it has more machine work on it than the others. At the same time it will also give an idea as to what is required in the way of jigs and fixtures for the other types. Furthermore, the G.E.-70 motor uses armature housings whereas the other types do not. The only change that was made from the original standard was in the axle bearing fit, which had to be made larger.

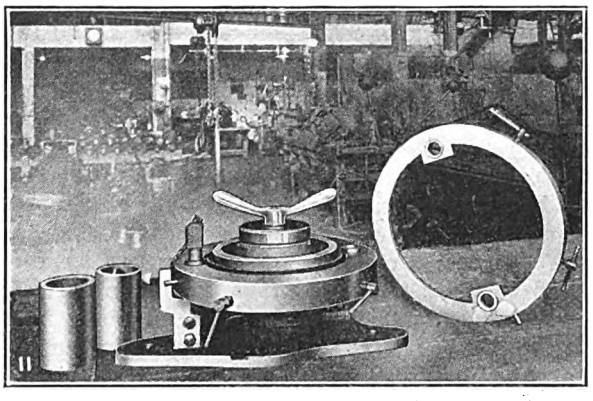
The various operations in this reclamation program were as follows: (1) Remove all fields and electric fixtures. (2) Clean frame thoroughly. We use sand blast. (3) Weld all cracks in the four housing bolt holes and other bolt holes that may be worn. (4) Plane ⅛-in. off each half of the frame. (5) Bolt the two halves together with a ¼-in. shim between them. (6) Place the frame in the fixture on a horizontal mill, bore housing fits first, pole piece seats second and axle fits third. (7) Redrill the housing bolt holes by jig, and tap out to size; also drill other bolt holes that were welded. After all burrs are filed off, case cleaned out and serial numbers stenciled on, the frame is ready to be assembled again and tested.



No. 9—Drill Jigs in Place Ready for Redrilling of Frame



No. 10—Drill Jigs and Fixture for Redrilling Bolt Holes in Armature Housing



No. 11—Armature Housing Set Up for Redrilling

Explanation of Details

In operation 3, the welding, if done by an electric welder, will prove more economical and make just as good a weld as by other methods. Care should be taken to build up the worn places that will not clean up during the machine operation, such as the support for gear cases.

In operation 4, the planing of each half to the depth of ⅛ in. trues up the field frame split, gets under all wear and brings the field frame back to a perfect fit. This is, of course, necessary, both mechanically and electrically. This planing operation allows the two halves to come close enough together to permit the reboring of the housing fits to the original standard. The gear case support on the motor case, which is usually badly worn by the gear case becoming loose, will also be brought back to normal shape. As the two halves are so different, it is necessary to have two planer fixtures to set each half up. Illustrations 1 and 2 show the two planer fixtures. Illustrations 3 and 4 show the frame halves set up in each fixture. These fixtures are so constructed as to make the set-up very quick and accurate as the half rings seen in illustrations 1 and 2 make the part self-aligning. The rings are hinged to the bed pieces to permit the frame to slide into place when making the set-up.

In operation 5, the bolting of the two halves together with a ¼-in. shim between allows the top half to clamp the armature housing tight so there is no chance for the housing to rock back and forth. This shim is removed after the machine work has been done, giving the necessary clamping effect in final assembly.

In operation 6, the complete frame is placed in the fixture on the horizontal mill. Illustration 5 shows the fixture and No. 6 shows the work set up ready for boring. This fixture is self-aligning and does not require the use of a measuring tool in the set-up, although where frames are worn very badly, it is a good plan to check all over before doing any machine work as it may be necessary first to build up a badly worn place by welding. This should, of course, be done before the machine work has been started, as the frame may warp.

This fixture also has two measuring arch bars, one on each end, which when clamped in place give the exact radius the housing fits are bored to; and by setting the boring tool up to this measuring bar, it will bore to the correct size. This is a big time saver as it does away with try fits. The lower radius of the housing fit has about twice the bearing surface as the upper part on a G.E. 70 motor. This makes it necessary to cut over half the bearing surface before one is able to measure across the diameter with a pair of calipers. Hence, using the measuring bar, which has a set size on it, does away with all waste time.

The housing fit is bored first as it is the largest and the frame is less likely to move while boring the smaller sizes. Any movement would result in bearings

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not being parallel, which, of course, is essential to a smooth running motor.

In operation 7, to redrill the housing bolt holes the upper half of the frame is removed and the lower half having the bolt holes is clamped on the fixture shown in illustration 7. This is a very simple but effective fixture and makes a very accurate job. This redrilling outfit consists of one fixture and three drill jigs—one jig to drill holes for the pinion end housing, one for the commutator end housing and one for the gear-case bolt hole. Illustration 8 shows the frame clamped in place ready for drill operations and No. 9 shows the drill jigs placed ready for drilling.

In most cases it will pay to reclaim the armature housings and this has developed into a comparatively simple operation. The most important two things to consider are the outside fit of the housing and the bearing fit. The outside fit is gained by turning down and shrinking on a band, to be turned down to standard, and by using a snap gage which is the only positive way for accurate measuring in quantity production. The bearing fit can be brought back to standard by boring and brazing in a piece of seamless tubing and reboring to the standard size again. Illustration 10 shows the drill jigs and fixture for redrilling bolt holes in the armature housing. This fixture is used for both housings, which is accomplished by changing bearing fit bushings. There are two drill jigs, one for pinion end and one for commutator end. Illustration 10 shows the housing before any machine work had been done. No. 11 shows the housing placed in the fixture with the drill jig in place ready for the drilling operation.

When stamping a new serial number on the overhauled frames it is a good plan to stamp the number on all the bearing caps, and care should be taken to replace the same caps whenever taken apart, as the slightest variation in fit of bearing will cause trouble. This will happen when bearing caps are switched.

Proper Motor Testing Is Important

The testing of the motor when assembled is a very important operation as it may save a lot of lost time, due to armature or fields breaking down. Testing a motor with no load on it does not give a satisfactory test. In this shop, the motor to be tested is coupled to a generator, or another motor acting as a generator, and the generator given a load through a bank of grid resistors. This load on the motor will cause any weak parts to show up, thereby saving the time of installation of the motor on a truck, if it is in a condition that it would go down on the road.

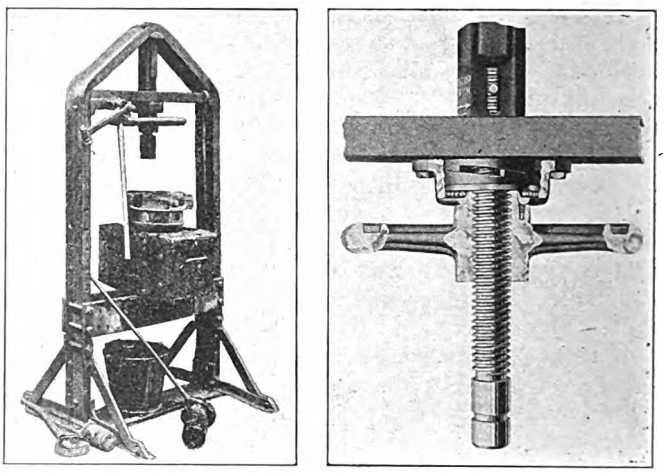
As will be readily seen from the foregoing a considerable outlay in jigs and fixtures is involved in this program, and besides the fixtures, a planer, boring mill and radial drill press are necessary. The cost per motor depends on the number handled, and a low cost cannot be obtained unless the whole proposition is handled on a quantity production basis.

With the fixtures and machine tools described and three operators on constant production, excluding the welding operation and motor assembly, two motors per day have been produced. As the motor is practically as good as new when completed and tested, the cost of the job per motor can be easily justified. From the experience already gained, it is planned to design and build like jigs and fixtures for all types of motors on this property and incorporate this work as a part of the regular maintenance. As soon as a motor frame reaches the point of wear that all parts cannot be kept securely and accurately bolted in perfect alignment, it will be removed from service and reclaimed by this scheme of operations.

Convenient Press for Forcing Bearings Out of Housings

THE accompanying illustrations show the equipment used at the Federal Street car shop of the New York State Railways in Rochester for pressing bearings out of their housings. A Weaver forcing press of 28-ton capacity is used and the housing is placed on a special wooden block 12 in. x 12 in. x 21 in. with a 6½-in. hole in the center and a ¼-in. iron top plate. This wooden block is provided with end handles for convenience in lifting.

The press used is made by the Weaver Manufacturing Company of Springfield, Ill. The frame is made of one solid piece of 5-in. 9-lb. high carbon channel steel bent to proper shape. The top is reinforced by a rigid truss brace construction, which prevents its springing under severe load. A hand wheel 15 in. in diameter with a



At Left, Forcing Press for Removing Armature Bearings; At Right, Quick Release Washers and Ball Bearings

screw 2 in. in diameter gives a range of movement of approximately 12 in. The width between frame uprights is 32 in., the height over all 72 in. and the theoretical leverage 1,500 to 1 with the lever in the lower notch and 3,000 to 1 in the upper notch. The floor space occupied is 3 ft. x 3 ft. The bolster which supports the wooden block consists of two heavy steel plates rigidly bound together by large spacing spools. Its height can be readily adjusted by inserting bolts through holes provided in the framework.

A feature of the press is the mechanism provided for quick release. This is shown in the detailed illustration. The two large cam-faced washers or truss bearings under the horizontal brace permit the pressure to be released easily by one reverse stroke of the lever. As the pressure on the screw is developed by carrying the wheel to the right these cam-faced washers tend to climb one upon the other. The angle of the cam faces is such that they will not back off, however severe the pressure may be. The reverse stroke of the lever will reverse their action, regardless of the amount of pressure upon them, releasing the pressure on the screw and permitting it to be spun up quickly by the hand wheel. The press weighs approximately 400 lb. and can be readily moved about the shop. Its construction is such that it is unnecessary to bolt it to the floor.

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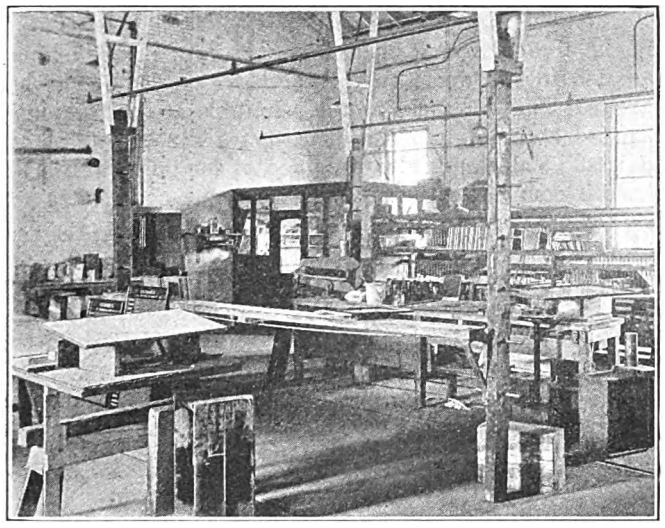
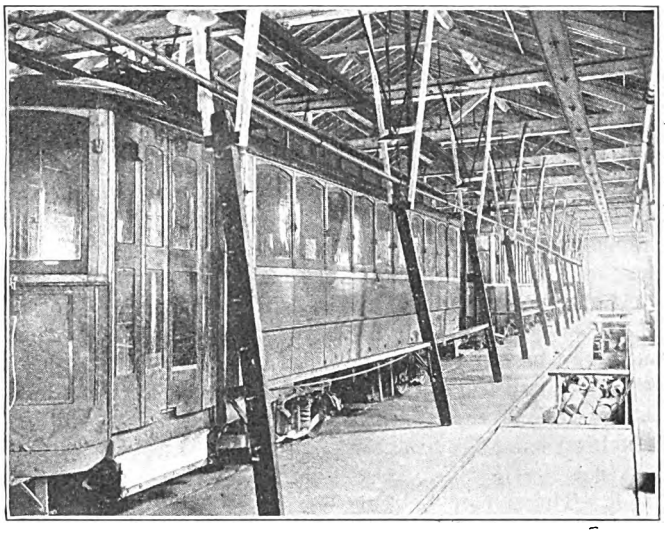
Improved Paint Shop Facilities in Rochester

Permanent Scaffolding Which Is Quickly Adjustable to Any Height, Air and Gas Piping with Convenient Outlets for Burning Off Paint from Cars and an Effective Lighting System Are Some of the Features of the New Paint Shop of the New York State Railways

CROWDED conditions at the St. Paul Street shop of the New York State Railways, in Rochester, led to the remodeling of a carhouse at the Federal Street shop for use as a paint shop. The building used is 175 ft. long x 50 ft. wide and has four tracks running the entire length of the building. This gives a capacity of sixteen cars. Excellent lighting conditions are afforded by windows along the two outside walls. As the building is a considerable distance from other adjacent shop buildings, there is no interference with the light. The two outside tracks in the shop are provided with pits, although this is not considered essential for a paint shop. These pits were in place in the building as originally used for storage of cars.



FOREMAN'S OFFICE AND SECTION OF PAINT SHOP USED FOR SIGN PAINTING



ARRANGEMENT OF SCAFFOLDING, LIGHTING AND SPRINKLER SYSTEM BETWEEN TRACKS

The foreman's office is located in one corner of the building and is partitioned off by the use of car doors. This makes a very attractive office and at the same time permits the foreman to see what is going on outside through the many glass windows. Immediately adjacent to the foreman's office is the sign painting and lettering department. All work of this character for the entire Rochester system is done here.

PERMANENT ADJUSTABLE SCAFFOLDING PROVIDED

One of the most novel and at the same time convenient features of the paint shop is the arrangement of scaffolding for facilitating the painting of the sides of cars. This scaffolding, while permanent in construction, permits of both vertical and sidewise adjustments so that the staging on which the painters stand can be raised to any height as desired. The uprights which support the scaffolding are of wood 3 in. x 6 in. in section and supported at the top by saddles. The bottom end is free so that it can be moved in or out from the car body as desired. The top supporting saddles for the uprights come on a level with the tops of the windows in the cars, and a framework well braced reaches from this point to the overhead structure. For supporting the plank on which the workmen stand the upright is provided with seven projecting rods. These rods are ¾ in. in diameter and 12 in. long and project out on either side of the upright. They are spaced 12 in. apart, so that adjustments of the scaffolding can be arranged to height in even feet from 2 ft. above the floor level up to 14 ft. The top location is seldom used, however, as it is not required for ordinary car painting. The planks are 10 in. x 2 in. x 14 ft. long, and have a half inch rod running the entire length and arranged so as to form a truss for the planks. A bracket of the construction shown in one of the accompanying illustrations is bolted to each end of the plank. A top projection which has a hook fits over the top of the two rods in the uprights which serve as a support, and the lower end of the drop bracket rests against the lower rod. This provides a secure fastening and at the same time one which can be quickly changed as conditions warrant. In raising the staging the workman lifts first one end and then the other up to the next higher support. The brackets are made in two pieces of 2-in. x ½-in. wrought-iron straps. The ends of the planks are protected by 2-in. x 2-in. x 10-in. angle irons. These angles serve to give a firm foundation for the bolts which fasten the brackets and at the same time protect the ends of the planks so that they will not be split through handling. Uprights for supporting the scaffolding are arranged between adjacent tracks, and as shown in one of the accompanying illustrations the same scaffolding can be used for work on two cars at the same time.

At the end of the shop, which is provided with entrance doors, uprights are installed against the walls between adjacent doors. These come between the tracks, and the uprights are provided with rods the same as in the other parts of the shop so that the scaffolding can extend entirely to the doorway. This makes the entire length of the shop available for car-painting.

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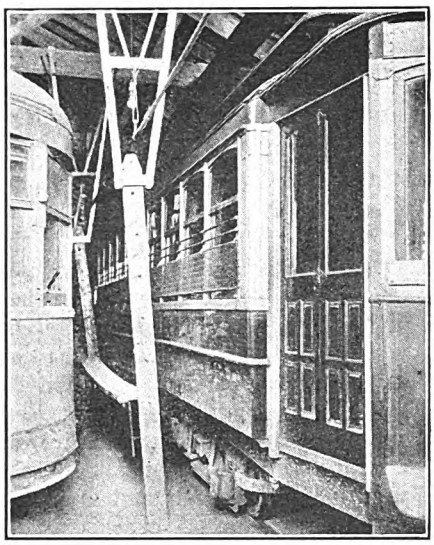
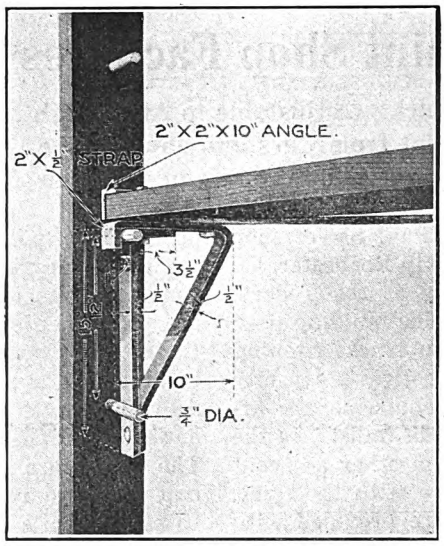
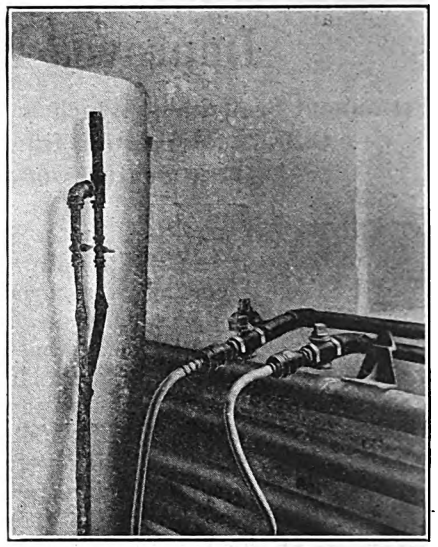






AT LEFT, A SINGLE ROW OF SCAFFOLDING PERMITS PAINTING OF CARS ON TWO SIDES. IN CENTER, BRACKET CONSTRUCTION FOR PLANKING SUPPORT OF SCAFFOLDING. AT RIGHT, HOME-MADE BLOW TORCH AND CONNECTIONS TO AIR AND GAS PIPING

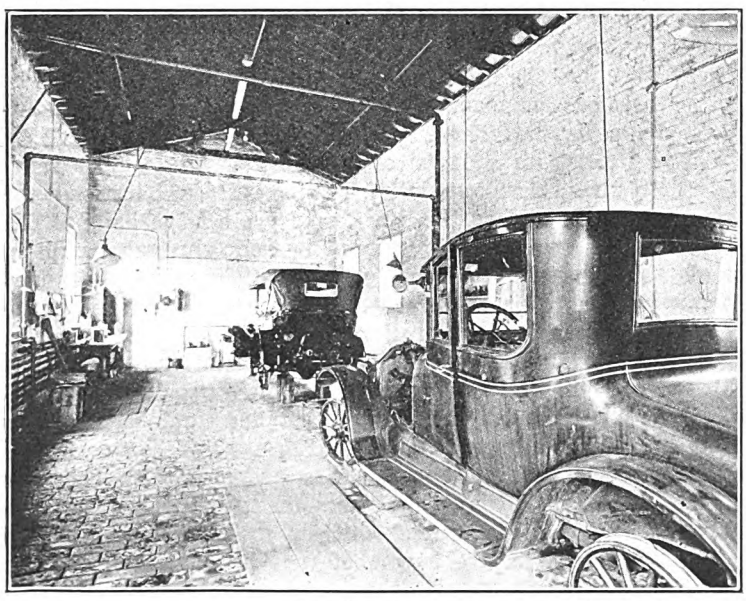
The artificial lighting for the shop is provided by sixty-five 75-watt lamps. These are arranged in five rows, one between adjacent tracks and one along each side wall. The lamp bulbs are frosted at the bottom to prevent glare and the fixtures are also provided with reflectors. In height the lights come about on a level with the car roof. This lighting system gives ample light during the darkest season of the year, so that reliable and accurate work can be done.

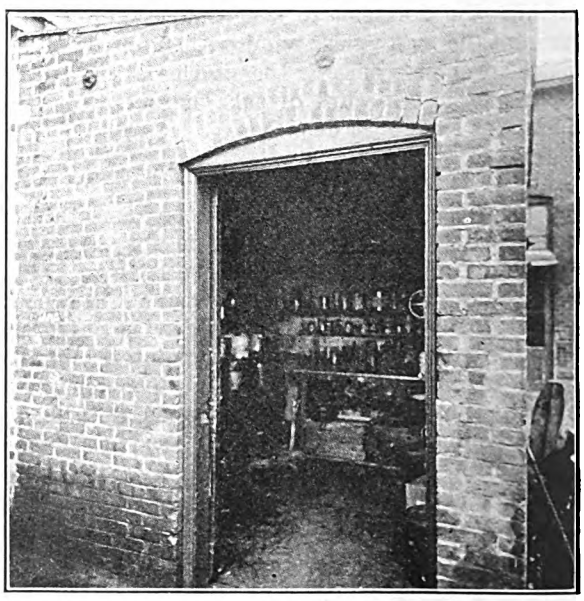
Another convenience provided in this shop is a system of air and gas piping for attachment of hose so that paint can be burned off the sides of cars. Two rows of ¾-in. pipe run the entire length of the shop on each side wall. Outlets are provided at convenient distances for attaching the hose as shown in one of the accompanying illustrations. "New Thor Perfect" hose couplings are used. These can be connected and disconnected instantly by a straight pull on the sliding sleeves. It is not necessary to twist them to remove the coupling, as the bevel jaws separate as soon as the locking shoulder moves back. The bevel jaws and locking shoulders are heavy with large bearing surfaces, which give extreme durability. A home-made torch constructed of ⅜-in. pipe is used for burning off the paint. As shown in the accompanying illustration the two lengths of hose are led to two arms on the torch which come together at *tee*. Shut-off cocks in the ⅜-in. pipe are conveniently located and regulate the quantity of air or gas as required. Valves are also provided at the point where the hose is coupled to the pipe. These have no handles and can only be turned by a wrench.

An efficient heating system is necessary in a well-constructed paint shop. The heating system in the paint shop of the New York State Railways consists of banks of steam pipes which run the entire length of the building on each of the side walls. Each bank consists of eight 2-in. pipes. The temperature of the shop is kept at about 70 deg. Fahr., as this temperature is considered best for drying and also is not uncomfortable for the workmen.

As may be seen from one of the illustrations a sprinkler system for fire protection is installed. The outlets for this sprinkler system come about on a level with the car roofs. Five lines run the entire length of the shop, one between each pair of tracks and one along the side walls.

The paints are not kept in the paint shop at night, and during working hours only the necessary quantities





AT LEFT, AUTOMOBILE PAINT SHOP. AT RIGHT, PAINT STORAGE DEPARTMENT

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which are required while the painting is in progress. A paint storage building has been constructed adjacent to the paint shop which is entirely fireproof and isolated to prevent any danger from fire.

A building immediately adjacent to the paint shop is used for painting automobiles owned by the company. An interior view of this is shown in one of the accompanying illustrations. This is a well-lighted building and has steam pipes installed along the walls the same as the paint shop. The building is 20 ft. x 50 ft., and approximately thirty cars are painted here each year..

Getting Rid of Hard Spots

With Rigid Construction, Hammer Blows from Trolley Wheels Produce Hard Spots, So the Problem Is to Soften the Blows by Providing a Flexible Type of Construction

BY G. H. MCKELWAY
Engineer of Distribution Brooklyn (N. Y.) Rapid Transit Company

THE line engineer has, for many years, been trying to improve the hangers used for attaching the ears to span or catenary wires or to troughwork in an effort to eliminate what are generally spoken of as "hard spots" in the line. Under spans a partial remedy was early found in the practice of "tight trolley and slack span," in which the trolley wire was run and kept under considerable tension while the span wire was allowed to sag to quite an extent between poles.

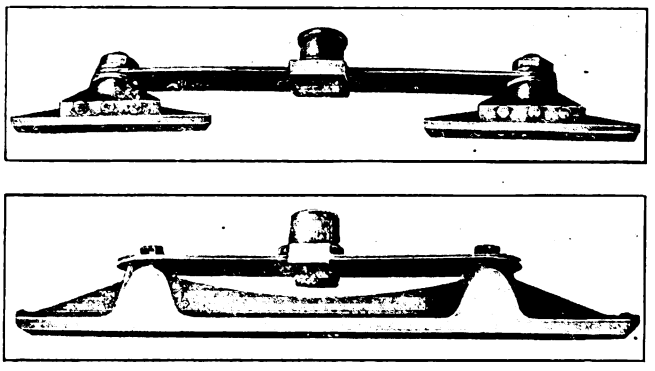
This plan worked so well that in order to prevent the hammer blows from the trolley wheel when the hanger was rigidly attached to some inflexible object, as, for instance, a bracket arm or piece of trough, the same construction has been attempted there, and except in a few cities this has become standard under mastarms, although not, as yet, looked on with favor for troughwork, on account of its high first cost and cost of maintenance. With catenary construction, not only are the blows softened by the long span of the catenary wire between fixed supports, but the hangers are, in many cases, made with long loops where they hang over the catenary, so that they can rise and fall with the trolley wire without having to lift the weight of the catenary.

Such hangers as are now used with catenary construction could not well be used under spans or bracket arms as they would move along the span or arm and cause the wire to get out of alignment, so that there has been no marked improvement in the methods used with these types since the substitution of the short piece of span wire instead of the direct attachment of the hanger to the mastarm. The use of some sort of a spring, either attached to or made a part of the hanger, is an old idea but one that has not received much attention until the last few years. More than twenty years ago attempts were made to reduce the force of the blow by means of a spiral spring contained in the hanger, which spring surrounded the stud and was compressed when the trolley wire was raised by a passing car. This type of hanger never came into general use even on lines where there were many mastarms or much troughwork, as the hangers cost more than the ordinary type in the first place and were difficult to maintain on account of failure of the springs.

The first use of a flat spring in combination with a hanger, so far as the writer has heard, was a "home-made" affair consisting of a standard round top hanger, sprung in on a span, with a thin piece of flat spring steel with a hole drilled in each end of it, fastened to the stud of the hanger by means of a nut and with a bolt through the hole in the other end, the ear being screwed on to this bolt. This construction apparently worked satisfactorily and gave no trouble so far as its maintenance was concerned. Its appearance, however, was against it and it was later discarded for that reason and not for any failure of the hanger itself.

It could not have been used so well, however, under trough as on the span. In the former location there would have had to be enough bend in the spring to prevent the wheel from touching the stud of the hanger as it passed and this bend would have suspended the wire so far below the bottom of the trough that there would have been a probability that, if the wheel should leave the wire, it would ride on the trolley and tear out the supports or damage the car equipment before the car could be stopped. The lowering of the plane of the wire would also lead to the danger of the pole fouling both the wire and the overhead structure supposed to be protected by the trough, unless the trough siding was made deeper than usual.

A few years ago the Ohio Brass Company brought



AT TOP, FLEXIBLE EXTRUDED EARS; AT BOTTOM, SPRING TYPE HANGER

out its flexible extruded ear, consisting of an ordinary hanger to which is screwed a boss, through an opening in the bottom of which is run a strip of steel spring having a short, extruded metal ear fastened to each end of it. The two short ears, each 5 in. long, and mounted with their centers 10 in. apart, act practically as a single ear 15 in. long but with its most flexible portion in the center instead of at the ends. Many of these ears have been put into service on spans as well as under trough, and satisfaction with them has been reported by users from various parts of the country.

In order to avoid the maintenance of the two short ears instead of the single longer one, which has been urged as an objection to this type of ear, an attempt was made on one system to substitute for the Ohio Brass construction a modification consisting of two mine hangers attached to the bottom board of the trough, supporting between them a flat steel spring to the center of which was attached an ordinary straight line ear. Although the stud of one of the hangers passed through a slotted opening in the spring instead of the closely fitting round hole used with the two ears, this construction was not successful and trouble was experienced due to the springs breaking. This, however, might not have occurred if the grade of spring steel had been more carefully chosen.

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Quite recently the Drew Electric & Manufacturing Company brought out a spring ear using only a single ear clinched on to the wire. This ear, which is shown in one of the illustrations, has what might be called two bosses, between which is held the piece of spring steel, to the center of which is attached the single hanger which supports it. With this ear, as with the one just described, one of the holes in the strip of steel is slotted instead of being round.

The same company is producing what it calls a "cushion ear"; that is, one with the center 5 in. of the groove hollowed out to a depth of about ⅛ in. more than at the ends. It will be seen that until the wire has been driven up into the groove to a point where it is held solidly against the top of the hollowed out portion there should be no pounding on the wire directly under the hanger and but little, if any, wear upon the wire. Sections of such an ear cut open in the center, after having been up for some time, and having undergone considerable wear, showed the wire in the central portion still unworn and still protected by the lips of the ear which had been clinched around it. The lips in the center had evidently been worn away to a slight degree, but as this occurred the wire was forced further up into the vacant space in the ear above it and the rolling action of the wheel clinched more of the walls of the groove around the wire so that the latter remained still untouched by the wheel at that point.

A rather curious circumstance in connection with this cushion ear was that shortly after it had been placed on the market the writer described it to an "old timer" who had been a railway lineman for thirty years or more and was informed by him that "in the old days" he had installed just such ears, although they have not been used for many years, so many that they were now supposed to be a new development. The ears, he said, had given good service and he knew of no reason for abandoning them unless they had been superseded by something which could be manufactured more cheaply.

Copper Salts Improve Casein Glue

IT HAS been found that copper salts added to casein glues greatly increase their resistance to moisture and also make them more durable when exposed to the action of molds and fungi. Casein glues containing copper are nearly as moisture resistant as blood albumin glues.

In the preparation of copper-casein glue at the Forest Products Laboratory, Madison, Wis., 2 or 3 parts by weight of copper chloride or copper sulphate are dissolved in about 30 parts of water and are added to every 500 parts of the ordinary casein, lime and water glass glue. The copper solution is poured into the glue in a thin stream. The violet-colored lumps formed at first by the coagulation of the glue by the copper solution are reduced by stirring vigorously for about fifteen minutes, and a smooth violet-colored glue results. It is necessary to add the copper salts after the other ingredients are thoroughly mixed, in order to obtain beneficial results. Copper added to the casein before the lime and water glass is ineffective.

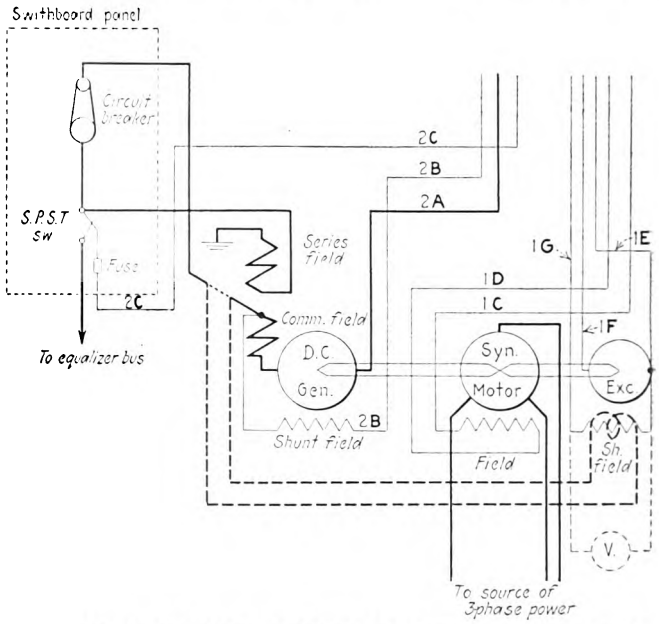
Glues containing little lime are especially improved by the addition of copper. A low-lime glue with copper may be as resistant to moisture as a glue with more lime in it, and copper does not shorten the "life" or workability of the glue as much as more lime would.

Inexpensive Compound Winding for Synchronous Motor Exciter Field

One Turn of Wire on Each of Two Poles of Exciter Field of 750-Kw. Motor-Generator Set Eliminates Regulation Difficulty in Substation of Oakland, Antioch & Eastern Railway

THE Oakland, Antioch & Eastern Railway is equipped with 750-kw. motor-generator sets, with 11,000-volt motors and 1,200-volt direct-current generators, the motors being of the self-starting synchronous type. Due to overloads on these sets as high as 200 per cent, the overloads being of widely varying character, it was found to be necessary for the operators constantly to be regulating the machine during overload periods. The difficulty was overcome by taking one turn of the negative lead of the generator around each of two poles of the exciter. These exciters are of the non-interpole type, of 18 kw. capacity, and tests showed that during the overload period it was necessary to raise the exciter pressure 40 volts.

The accompanying diagram shows how the series winding for the exciter field was cut into the generator circuit. While the arrangement shown is not altogether new, it is of interest to substation operators having difficulty with violent load fluctuations, because the work



SYNCHRONOUS MOTOR-GENERATOR SET WITH SERIES TURNS ADDED TO EXCITER FIELD

Key to Wires Reaching Beyond Bounds of Diagram:

At top of diagram, left to right—*2B* to direct-current circuit breaker through rheostat; *2A* to direct-current circuit breaker; *2C* to voltmeter; *1G* and *1F* to exciter field rheostat; *1E* to switch for connection to *1C* (which see); *1D* and *1C* through rheostat and two-pole switch to *1F* and *1E*, circuit shunted at switch with field discharge resistance.

Heavy wires at bottom of diagram go to main circuit direct or through auto-transformer, depending on supply line voltage.

was done in this case at a cost of $80 per machine, including the purchase of a voltmeter for the exciter circuit.

The motor-generator sets are now operated as follows: With no load on the generator the exciter voltage is 85 and motor operates at unity power factor. At full generator load the power factor is 90 per cent, leading current, and at 150 per cent overload the power factor is 98 per cent, lagging current. Under the last-named condition, the exciter voltage is 129.

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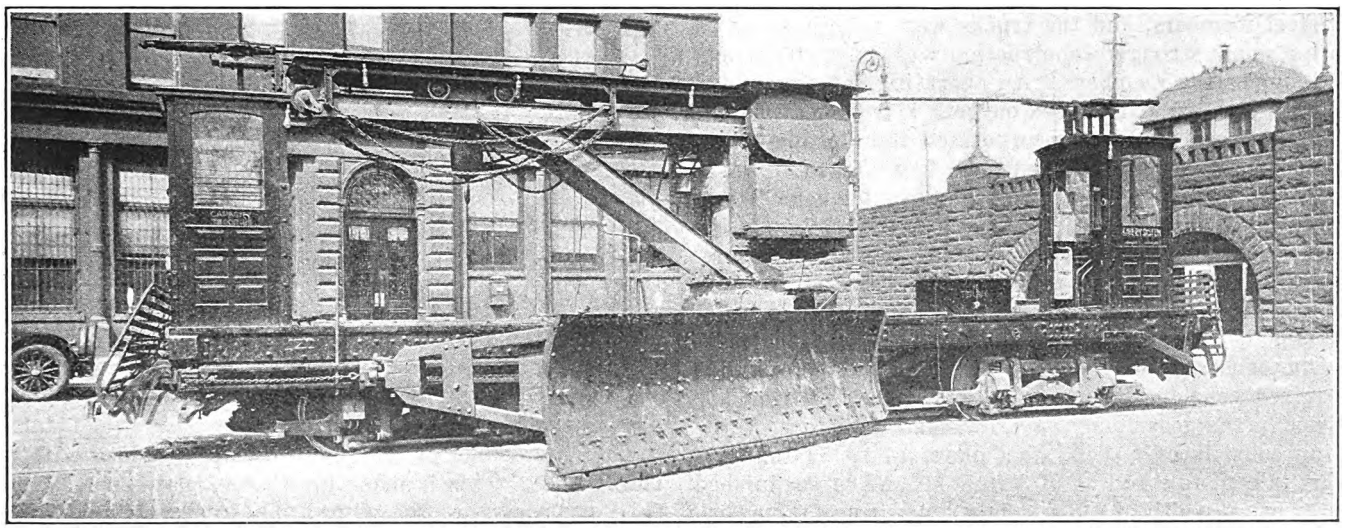


CRANE CAR READY FOR SERVICE

Crane Cars Solve Snow-Removal Problem

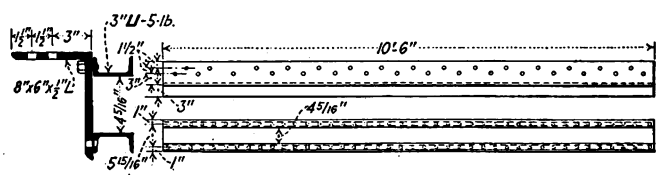
Three Crane Cars Designed by the Third Avenue Railway, New York City, for General Track Repair and Handling and Transporting of Miscellaneous Materials Have Been Used to Increase Snow-Fighting Equipment by the Addition of Wings

IN THE VICINITY of New York the principal difficulty encountered in the operation of street cars during and immediately after snowstorms has of late years been the increasing use of the street car tracks by automobiles. After the street railway company has cleaned its own tracks and before the municipality has had a chance to remove the snow from the roadways adjacent to the tracks, the street car tracks have been the only path open for the automobiles. This condition has been particularly troublesome on lines operated by underground conduit, for on these lines a stalled auto truck on the street car track prevents the operation of the conduit cleaning devices, which must be operated to keep the conduits from clogging up with snow.

On the theory that if you want a thing done the best way is to do it yourself, the Third Avenue Railway concluded that it had to clear the roadways adjacent to the car tracks, as well as the car tracks, if it did not want its lines blocked by the auto traffic using the tracks. For this purpose a steel snow wing, which would clear a path 12 ft. from the side of the car, was mounted upon one of the company's crane cars and tried out in the winter of 1920-1921. The results obtained from the trial were so satisfactory that it was decided to purchase three additional cranes and snow wings and apply them to three standard flat cars, so that there would be four cars available for this roadway cleaning service for the winter of 1921-1922. In operation it was found that this steel snow wing was able to clear the highest drifts encountered, running up as high as 6 or 7 ft., while running at speeds up to 20 m.p.h., the only limit to the speed within this range being the distance on the side of the roadway that the snow could be thrown. In running through congested streets, where the snow could only be pushed back a few feet, it was necessary to operate slowly. When running through the open country, where there was no limit to the distance the snow could be thrown, the plow could be operated at the highest speed of which the car was capable. The snow wing was made heavy enough so that it would shear off any piles of dirt or other removable obstructions encountered, though the usual care was necessary to prevent collision with fixed obstructions, such as curbs and elevated railway columns.

While the depth of the several snowfalls in the vicinity of New York during the winter of 1921-1922 was not great, the Third Avenue Railway was enabled to remove the snow from the roadways adjacent to its tracks wherever this was necessary. This, of course, does not refer to those streets on which elevated structures are located. It is the confident expectation that with this equipment the company will be able to cope with the most severe snowstorm that is likely to occur in the vicinity.

Accompanying illustrations show details of construction used for remodeling three flat cars so as to provide for the installation of cranes and also to provide necessary attachments and reinforcements for adding snow wings to be used during the winter season. As designed, these cars can be used for



STEEL GUIDES FOR SLIDE BLOCK OF SNOW WING

general track repairs and the handling and transportation of miscellaneous railway material at all times, and during severe winter conditions when additional snow-fighting equipment is required they can be used for snow removal. The design provides for necessary attachments so that snow wings can be added and thus the snow-fighting equipment of the railway can be increased considerably.

These cars were constructed from flat cars by reinforcing the frame and body construction by the addition

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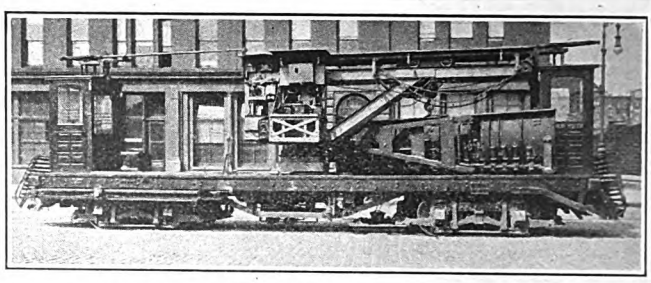
of steel members, and the trucks were rebuilt so as to give a much stronger construction with heavier springs and supporting members. An operating cab was added at each end, an attachment on both sides for the addition of snow wings was incorporated and a crane equipment furnished by the Chesapeake Iron Works of Baltimore, Md., was mounted in the center of the car. These cars are 34 ft. 4 in. over bumpers and 7 ft. 7 in. wide over floor. The sides were reinforced by 5-in. x 5-in. x ⅝-in. angles and the center portion of the car was strengthened by substantial steel cross members and trusses.

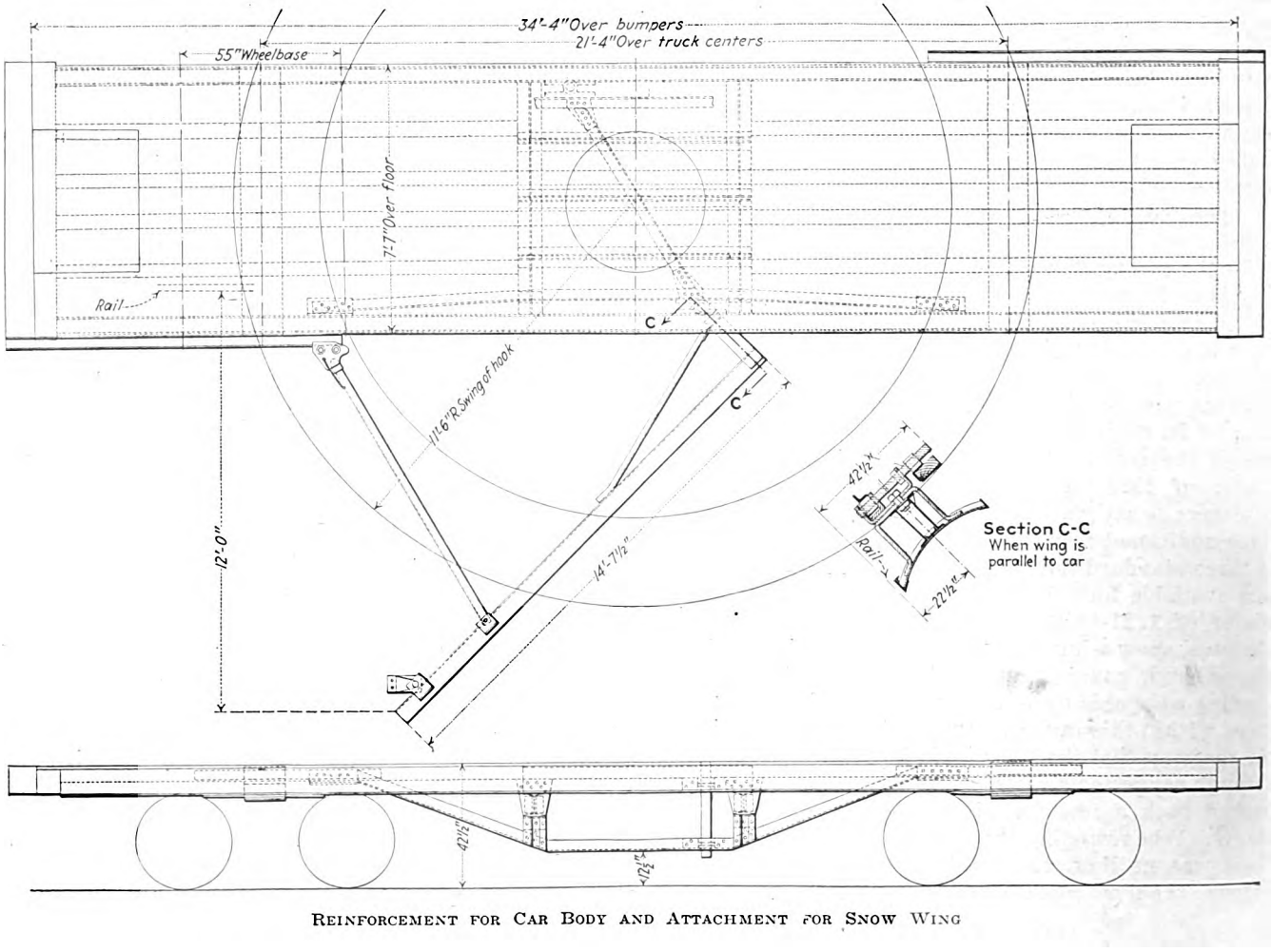


WING LOADED ON CAR FOR TRANSPORTATION

The construction and attachment of the snow wings required considerable thought, and details of this are given in the accompanying drawings. The face of the wing consists of a ⅜-in. steel plate, 14 ft. 7½ in. long. This is bent to a radius of 3 ft. ½ in. and in its finished form has a width of 40 in. The supporting framework of this wing consists of two 6-in. x 4-in. x ¾-in. angles running lengthwise at each edge with 2-in. x 2-in. x ⅜-in. angles for cross-members spaced from 14 in. to 15½ in. apart. A further strengthening channel support is provided which runs from the center of the wing back at an angle to the supporting end. This extends back a distance of 16½ in. from the back side of the wing, and gives a firm supporting base for attaching to the car framework. A detail of the brace for this snow wing is also given, together with the steel guide which has been added to the side of the car for supporting this. As at present arranged, this wing can slide along the side of the car for a distance of approximately 10 ft., and the wing will fold in alongside the car to clear any obstructions which may be encountered. The slide block at the supporting end of the brace can be moved along the side of the car by means of an endless chain which passes around the drum of an ordinary hand brake staff.

The outside end of the snow wing is provided with a riding shoe. This is made up of steel plates and keeps the bottom edge of the wing a distance of 2¾ in. above the pavement. The construction of this riding shoe is shown in the accompanying details. In the accompanying illustrations the lower edge of the wing is shown with attachments which can be forced back should they strike an obstruction. Springs are provided on the back of the wing to keep these in position. This type of construction was used on but one wing. The others have wooden projections which will be knocked off if a sufficient obstruction is encountered. The idea of this arrangement is to provide a construction that will give way instead of transmitting strains that might injure the wing.

The crane mounted in the center of the car provides for the handling of the snow wing in an efficient manner. The current for operating the crane is obtained



REINFORCEMENT FOR CAR BODY AND ATTACHMENT FOR SNOW WING

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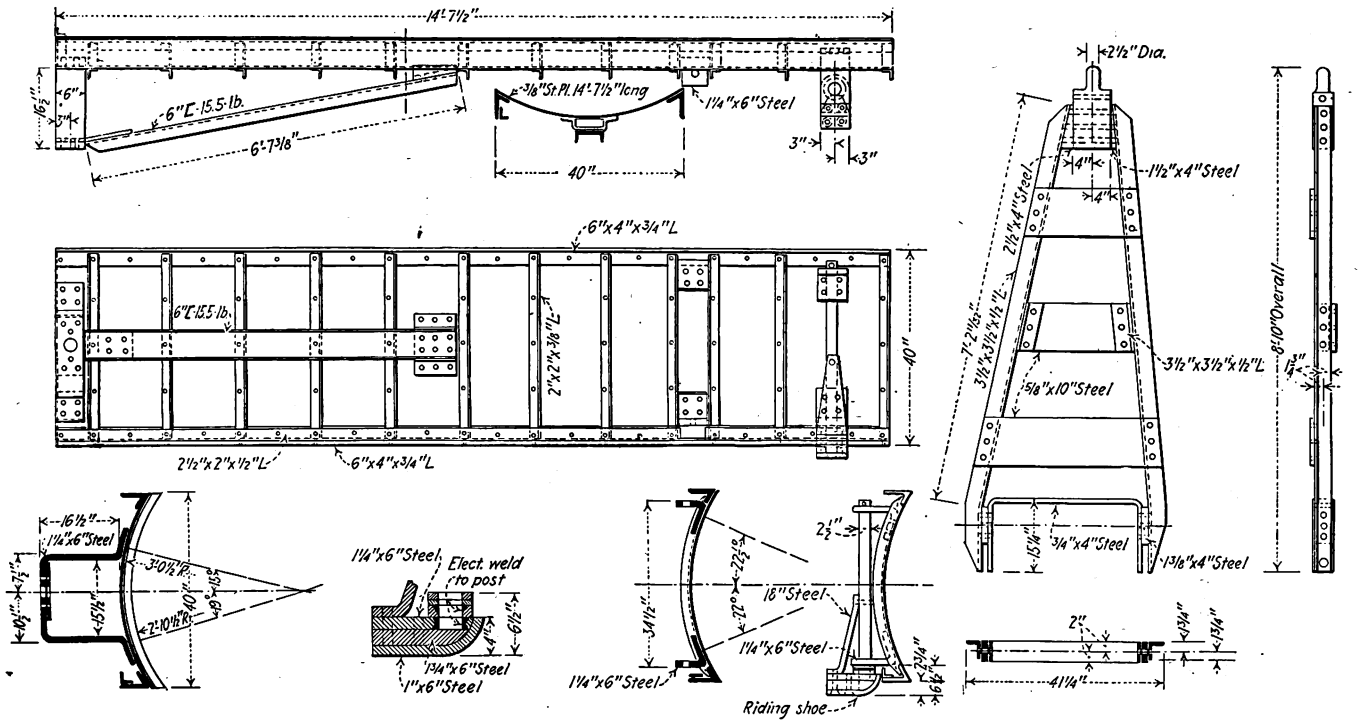
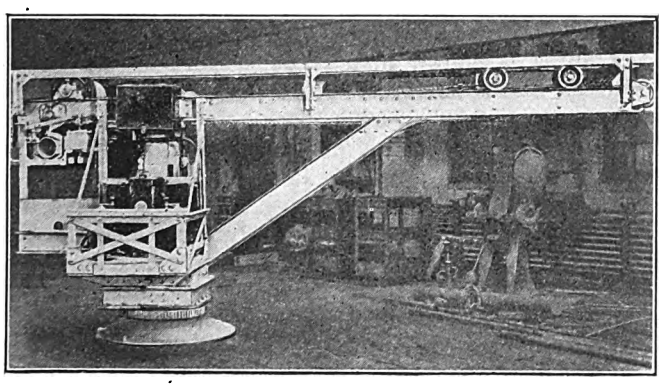


DETAILS OF SNOW WING, SHOE AND BRACE

from the regular contact system of the railway, which is used to operate the car. The crane motors are designed for a range in voltage from 360 to 650 volts. The low value was considered advisable to provide for emergencies during stormy weather where an exceedingly large drop in voltage might be experienced. The crane has the three movements, hoisting, trolley and revolving; each movement being operated by a separate motor and controller. The controllers are conveniently located in the operator's cage which is attached to and revolves with the crane frame. General Electric Company's motors are used. A 10-hp. motor is used for the hoist and two 3½-hp. motors for the trolley travel and for rotating the crane. The speeds provided for the crane under full load are hoist 26 ft. per minute, trolley travel 50 ft. per minute, and rotating two revolutions per minute. The hoisting motor is provided with full magnetic and dynamic braking. The revolving frame is supported and revolves on a stationary steel casting column which is held down to the special framing in the car body and is designed to perform all functions with a load of 3 tons supported at a radius of 11 ft. 6 in. from the center of the steel casting column.

One of the principal features of this equipment is the clearance in which the crane operates. The height from the top of the track rails to the top of the crane is but 11 ft. 9 in. and an effective hook travel of 9 ft. is obtained. The distance from the center of the column to the extreme rear end and to the extreme side of the operator's cage is but 4 ft., giving clear track space for passing cars. The extreme radius of the boom is 14 ft. and the effective radius of the hook is 11 ft. 6 in. The column base occupies a space of 4 ft. in diameter, and the clear height is 2 ft., which is available above the car floor alongside the column.

In addition to providing a very efficient piece of snow-fighting equipment, these crane cars have exceptional value for handling and transporting all classes of heavy railway material, such as poles, motors, controllers, car trucks, rails, etc.



GENERAL VIEW OF CRANE USED

Safeguarding Gasoline from Stray Railway Currents

THE National Fire Protection Association has recently given some attention to the prevention of fires in gasoline tank cars caused by electric sparks. The association states that this danger may be guarded against by insulation of spur tracks from main tracks carrying electric current, or by suitable grounding and interconnection, permanent or temporary, of rails, cars and oil-handling pipes and equipment.

The following rules were prepared by the association to cover this case:

1. On all side-track installations, where tank car shipments of gasoline or similar products are to be handled, and where there is danger from stray electric currents, an electrical connection must be made between the car or track and loading or unloading pipes before the loading or unloading operation is begun. This may be provided for temporarily by a portable conductor attached to the metal tank band of the car or permanently by protected cable or strong wire securely attached to the nearest rail on which the car stands.

2. All oil-siding rails must be insulated from other tracks when such sidings have a direct connection to tracks equipped with an electrical signal system or used by electric locomotives.

3. Such bonding connections must be frequently inspected to insure that they are in serviceable condition.

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Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

Using Bitulithic Waste as Ballast

The Hutchinson (Kan.) Interurban Railway Took the Contract for Removing Old Pavement and Used It for Ballast in Reconstructing the Track Bed

WHEN the city of Hutchinson, Kan., called for bids on the work of removing a layer of bitulithic pavement from the surface of one of its streets which was to be repaved with brick the Hutchinson Interurban Railway, which has a track along this street, entered the competition, secured the contract for the work, and also was given the privilege of using the material taken up as ballast for the track bed. In most cases where the bitulithic material is taken up after it has been worn out on the street it is purely waste material, but it proved excellent ballast and of great value to the electric railway company. The bitulithic material is composed of 97 per cent crushed rock and 7 per cent coal tar.

This work was done on Avenue A East, from Main Street to Pershing, a distance of eight blocks or 4,592 lineal feet. The street is 24 ft. from curb to rail, the track being in the middle of the pavement. The material was first pried loose from the concrete base by means of bars, broken by sledges, and run through a crusher which reduced it to particles of about 1 or 1½ in. in diameter. The crusher was a machine of the oscillatory type, mounted on a low-wheeled truck with a Westinghouse 323-A railway motor. The crusher itself was borrowed from the Carey salt plant, where it is used to crush defective salt blocks.

The power to run the crushing apparatus was taken direct from the trolley wire by means of a wire run up along a light pole. The whole apparatus was moved whenever it was desired to allow a car to pass.

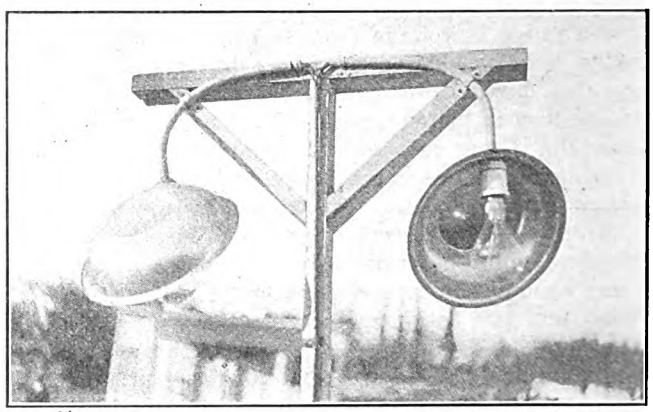
A large part of the work was done at night, because the heat in the daytime caused the material to run together, impeding the crushing. It crushed best at a temperature of 40 deg. Fahr. or below. During the day a stream of cold water was kept playing on the pavement, to keep it as brittle as possible. During the night light was provided by clusters of five lights each, mounted on tall standards, and drawing electricity direct from the trolley wire. Reflectors behind these clusters concentrated the light. By this method the work proceeded as well at night as during the daylight.

The street produced about 1½ yd. of ballast on the track for each lineal foot. The crushed material remaining is now being stored for future use. The company maintained a full crew and crushed about 3½ to 5 yd. an hour.

The roadbed was prepared by excavating to a depth of 5 in. below the ties, giving about 14 in. of ballast to the ball of the rail. All ties used were treated with carbolineum. The ballast was thrown in after being crushed and tamped thoroughly until there was no movement of the rail. On top of the bitulithic ballast a 2-in. mat of rock asphalt was laid, bringing the top of the ballast and mat to about ¾ in. below the top of the rails. The track is of standard width and the ballast was put in for a width of about 12 in. on the outside of the rails.

Emergency Lighting Equipment for Track Rehabilitation

THE accompanying illustration shows a lighting stand of cheap construction used by the Toronto Transportation Commission for lighting track construction work. The reflectors consist of two tin basins with holes punched through one side for bringing through the



LIGHTING STANDARD FOR TRACK RECONSTRUCTION

leads to the lamp. Two of these units mounted on a wooden framework form a lighting unit, and the reflectors, when placed as shown above, provide a good distribution of light. The fixture is rugged and if one is knocked over during construction and damaged the loss is of small consequence.

Timber Preservation Grows in Importance

THE increased demand for permanent timber structures is shown in a recent report of the Service Bureau of the American Wood Preservers' Association. More than 2,400,000,000 board feet of timber for various purposes was pressure treated in 1921 by the 122 wood preserving plants in operation throughout the United States, thereby surpassing the 1920 record by nearly 17 per cent. Approximately equal amounts were treated with coal-tar creosote and with zinc chloride, the standard wood preservatives.

To treat this wood 51,375,360 lb. of zinc chloride, with an absorption of ½ lb. per cubic foot, and 79,384,326 gallons of creosote, with an absorption of 5 to more than 20 lb. per cubic foot, were required.

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A Practical Example in Track Replacement

Some Actual Calculations and Results Are Given Which Were Encountered in Replacing a Lorain Spiral Turnout with an A.E.R.A. Switch Easement

BY SAMUEL STRIEZHEFF
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Brooklyn (N. Y.) Rapid Transit Company

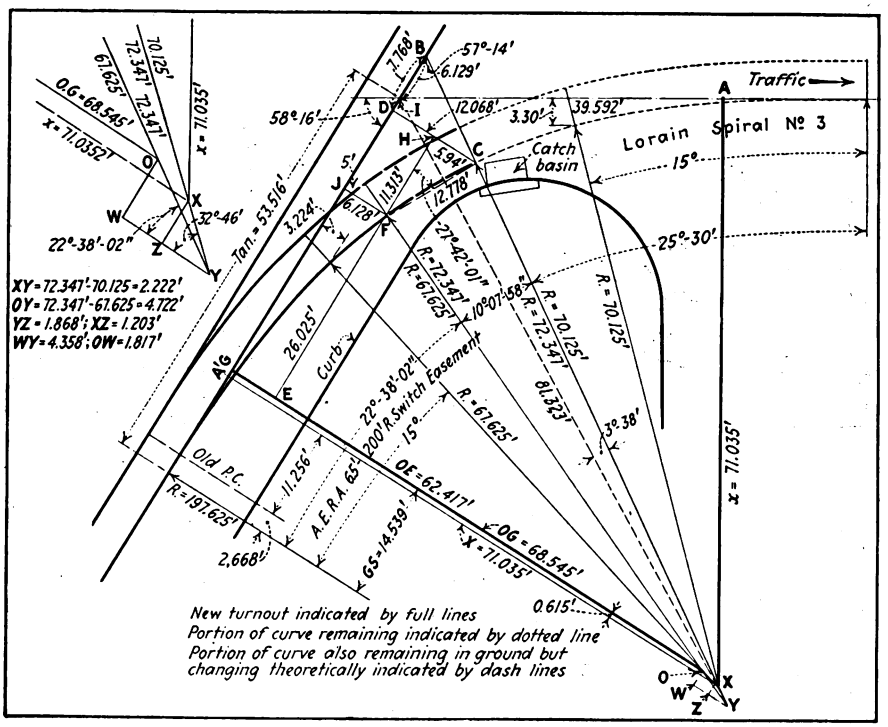
ON A RECENT job the problem of replacing the turnout portion of a curve containing a Lorain switch spiral with one having an A.E.R.A. switch easement presented several practical considerations. In this case it was desired to disturb as little of the remaining portion of the curve as possible. As the track passed very close to a sewer catch basin, as shown in the accompanying diagram, an approximate point *C* was tentatively established, just beyond the sewer basin, and the angle of the arc of the dotted portion was found, by scaling, to be 25 deg. 30 min. It was then necessary to select the proper A.E.R.A. easement and the immediately abutting radius for the new turnout so as finally to connect the dotted portion with this turnout by means of curve *FC* of the intervening radius. It was advisable to keep as near to the old radius as possible so as to eliminate the replacing and rebending of this *FC* portion.

A study of both A.E.R.A. easement and Lorain spiral tables revealed the fact that 15 deg. of the 6.5 ft.—200-ft. radius A.E.R.A. switch easement *A* terminates with an *X* offset to tangent equal to 3.224 ft., while a similar 15 deg. arc of Lorain switch spiral No. 3 has an offset of 3.30 ft., thus creating a practically similar condition for the plain curve abutting either on the easement or the spiral. It was then evident, without any preliminary calculations, that it would be best to select such a radius for the plain curve portion of the turnout itself as would closely approach the radius of the old spiral No. 3 turnout. A value of $R = 67.625$ ft. was picked out as one of the "recommended practices" given in the A. E. R. A. table. That much done, it was necessary to calculate the mathematical properties of the new turnout and of the dotted portion which remained unchanged, so as to locate their respective terminating points, *F* and *C*, for these latter would then be the ends of isosceles triangle *FYC*, the vertex angle of which would equal the arc of dash-line portion of curve of as yet unknown radius.

The Lorain spiral tables give the requisite $x = 71.035$ ft. and with half of the intersecting tangent angle of 58 deg. 16 min. the hypothenuse *XI* of right triangle *AXI* is found to be equal to 81.323 ft. By extending the radius line *XC* to the point *B* on the intersecting tangent the triangle *BXI* is obtained. Of this the side *XI* is known. All three angles are also known because the angle at *X* equals the difference between half of the intersection angle and the angle *AXC* of the portion remaining in the ground, while the angle at *I* equals the angle of intersection (58 deg. 16 min.) plus half its supplement. Then the angle *B* is easily found. It is opposite the known side *XI*. We, therefore, obtain *BI* equal to 6.129 ft. and *BX* equal to 84.477 ft.

Now by subtracting the radius *XC* of the dotted curve we obtain *BC* equal to 14.352 ft. Considering this as the hypothenuse of the triangle *BCD* with angles known, we find *DB* equal to 7.768 ft. and *DC* equal to 12.068 ft.

We have thus located the point *C*, which is the termination of the dotted remaining portion, with relation to the point of intersection of tangents and to the tangent at the end of easement *A*. Now taking up the A.E.R.A. easement which is to replace the old Lorain spiral turnout up to the end of the 5-ft. frog arm, we find that amount of arch that will include the frog arm



TURNOUT AS RECONSTRUCTED

equal to 22 deg. 38 min. 02 sec. terminating at point *F*. This portion is still unattached, as it were, and our duty now is to join it to the remaining portion through the medium of the unknown *FC* portion. With the radius *OF* of the easement known and used as the hypothenuse of the triangle *FOE*, of which the angle at *O* equals the arc of the entire turnout (22 deg. 38 min. 02 sec.) we find *EF* equal to 26.025 ft. (which we shall use later to obtain our tangent distance) and *OE* equal to 62.417 ft., which subtracted from the *OG* given in the tables leaves $EG = FJ = 6.128$ ft., this being the tangent offset of the terminating point *F* of our new turnout. Now we have to find the radius of the connecting portion *FC* and also locate definitely the point of tangency of the easement relative to the point of intersection of tangents, the Lorain spiral tangent naturally remaining unchanged.

If we project the values for *JF* on *DC* just found and subtract it from the latter we obtain *HC* equal to 5.94 ft., which we consider as one side of the right triangle *HFC*. The angle at *F* is equal to the angle of the entire easement *A*, plus half of the vertex angle of the isosceles triangle *FYC*, which in turn equals the

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difference between the angle of the intersecting tangents and the sum of the arcs of the dotted line and full line portions, namely, 58 deg. 16 min. — (25 deg. 30 min. + 22 deg. 38 min. 02 sec.) = 10 deg. 07 min. 58 sec., this being the arc connecting the dash-line portion. Half of this equals 5 deg. 03 min. 59 sec. and added to 22 deg. 38 min. 02 sec. gives the angle at *F* equal to 27 deg. 42 min. 01 sec.; with *HC* known. We then find *FH* equal to 11.313 ft. and *FC* = 12.778 ft., this being the base of the isosceles triangle *FYC*. We now find *YF* = *YC* = 72.347 ft., which is the radius of dash-line portion of curve.

The only thing remaining is to find the new tangent distance. By simply adding *GS* (as per table), *EF*, *FH* and *DI* we find the tangent equal to 53.516 ft.

The interesting feature about the dash-line portion *FC* is that as the radius is so close to the old replaced radius, there is no necessity for taking the old rails of that portion out of ground and replacing them with others of a new radius. It is necessary only to force the ends of old rails at *F*, ⅜ in. toward the tangent to meet the new turnout. It is also interesting to point out the simplicity of checking the foregoing calculations. Checking is, of course, necessary.

It is evident from the diagram that the point *X* (which is the center of the original plain curve abutting Lorain spiral on each end) remains in the ground in the same theoretical location and that *O* becomes fixed relative thereto, so that all we need to prove is that *WZ* equals the difference between the Lorain spiral *X* distance 71.035 ft. and the A.E.R.A. easement *OG* distance 68.545 ft., both being projected from the same tangent. Study of the sub-diagram at the left in the illustration will show that in the triangle *XYZ* we know *XY* and the angle at *Y*, therefore we easily find *YZ* = 1.868 ft. and *XZ* = 1.203 ft.

The same sub-diagram also shows us that in right triangle *OYW*, we know *OY* and the angle at *Y*, and so we find *WY* = 4.358 ft. and *OW* = 1.817 ft. Now subtracting *YZ* from *WY* we get *WZ* = 4.358 ft. — 1.868 ft. = 2.49 ft., which is exactly equal to 71.035 ft. — 68.545 ft. = 2.49 ft.

We can also prove our tangent distance by subtracting *XZ* from *OW* and obtaining 0.615 ft. We then subtract this from *A'I*, which is equal to *AI* on the other tangent, and get 39.592 ft. — 0.615 ft. = 38.977 ft., and adding to this *GS* we get 38.977 ft. + 14.539 ft., = 53.516 ft., the new tangent.

Manganese Centers

Manganese Welding of Special Work in Syracuse Shows that Successful Results May Be Obtained if Repairs Are Made with Particular Care and Before Trackwork Is Badly Battered

BY H. E. BEAN
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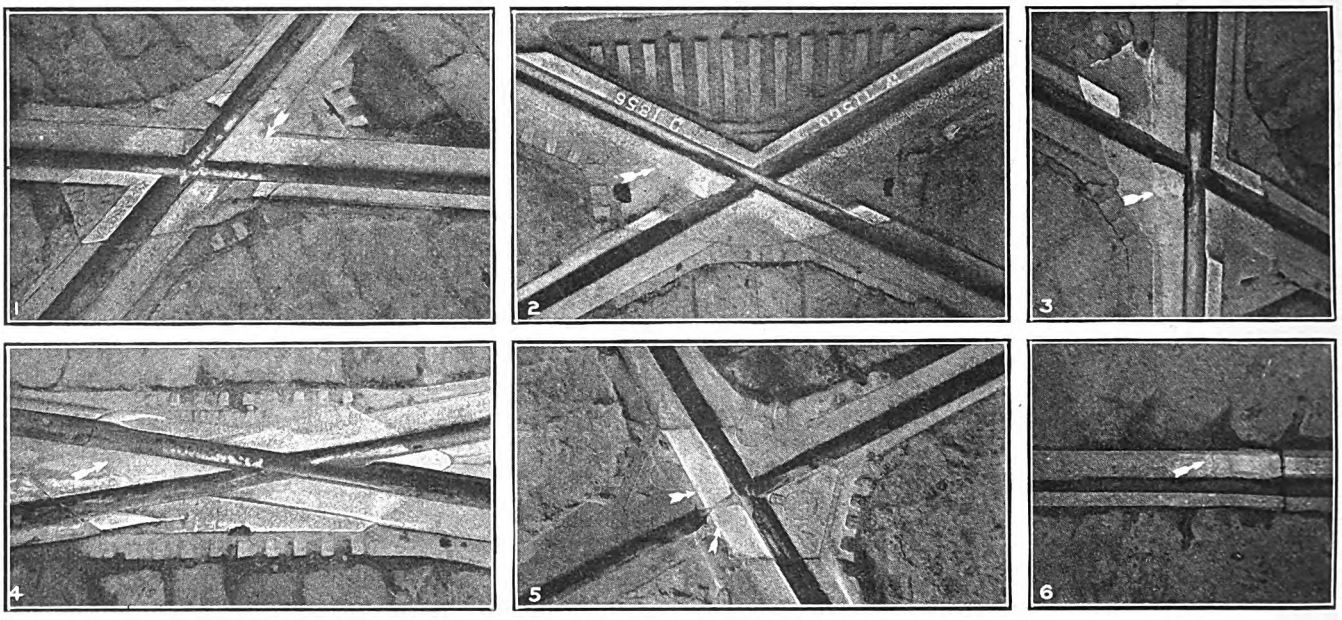
DURING the summer of 1921 some welds were made on manganese special trackwork at the intersection of South Warren and East Genesee Streets in Syracuse. The accompanying illustrations show the condition of this trackwork after nearly nine months service. There are no appreciable depressions on these frog points and the results secured so far have been very satisfactory.



FIGS. 1, 2, 3 AND 4—WELDED SPECIAL TRACKWORK AT THE INTERSECTION OF SOUTH WARREN AND EAST GENESEE STREETS, SYRACUSE
FIG. 5—THROUGH-RUNNING RAIL WITH JUMP FROG ON UNUSED TRACK AT SOUTH SALINA AND WATER STREETS, SYRACUSE
FIG. 6—ORDINARY WELDING OF STRAIGHT RAIL

Referring to the illustrations, the welds on the castings shown in Figs. 1, 2 and 3 were made about Aug. 1, 1921. The welding in each case began near the point indicated by the arrow. The wear since the welds were made is about what would be expected from new castings, there being a slight tendency of the metal to flow, but no apparent brittleness, cracking or spalling off.

The weld on the casting shown in Fig. 4 was made Feb. 20, 1922. This weld was made necessary by the breaking out of the entire frog point back to the point of the arrow. All of the frogs shown in Figs. 1, 2, 3 and 4 are located at the intersections of South Warren and East Genesee Streets in Syracuse.

The weld on the hard center in Fig. 5 was made to give a through-running rail on the main line track with a jump frog condition on the cross track. This crossing is at South Salina and Water Streets in Syracuse, and the filling in was made possible by the fact that the cross tracks are seldom used and then only for the

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storage of an occasional car which has become disabled in service. Fig. 6 shows a weld made on straight rail and indicates the result of ordinary track welding. In this case the weld was made at a coupled joint and, while the picture does not show it, the surface of the rail across this joint is in perfect condition.

The car movements over the frogs shown in Figs. 1, 2, 3 and 4 are about 391 daily, or for eight and one-half months since August 1 there have been approximately 99,800 car movements. The car operations over the frog of the casting shown in Fig. 5 have been at a rate of about 415 daily or a total of approximately 105,000 since the weld was made. It will be noticed from the illustration that the flanges of the wheels have made some depression in the welded metal, but there is still sufficient running surface on the rail head aside from the flange bearing, which in some instances is built up and ground.

METHOD OF MAKING THE WELD

In regard to the method of carrying out the work and of applying these welds to the special trackwork a very important factor is cleanliness of the parent metal. In this work we are now using a dilute solution of nitric acid. This acid has been cut with zinc to avoid the ill effects on the hands of the operators. The fumes from this acid, caused by welding, are disagreeable, and we are now experimenting with a neutralizing alkali in an effort to eliminate this objection. This, of course, is done after the acid has cleaned the metal to the desired extent. Wire brushing is also used to eliminate the scale or deposit of other foreign matter on the work.

The electrode used for depositing the metal is about a 15 per cent manganese coated electrode of ¼ in. diameter. This is applied by means of a resistance outfit, special care being taken to insure that the proper amount of current is used. This is generally less than is used on straight work by approximately 50 amp.

Frequent quenching of the weld by means of water applied directly or with a wet mop appears to have a toughening effect on the deposited metal. The method of applying the layers of material is varied according to the shape of the weld and the judgment of the welder. On welds which are nearly square a criss-crossing of one layer upon another is generally used.

Care should be taken particularly to maintain a short arc, thereby allowing the molten metal to pass from the electrode to the work with a minimum of contact with the air. This reduces the oxidation to a minimum. A long arc has a much greater tendency to sputter and to move from one side of the electrode to the other, while the short arc has a much greater tendency to remain globular in form and to accomplish the required result. The retention of manganese in the deposited metal can be determined approximately by the comparative color of the two metals after grinding. Where the results are good it will be found almost impossible to observe the line of demarcation. Grinding is important, of course, in order to secure as smooth operation as possible. It is of course impossible to secure satisfactory results from welding frogs that are so badly battered that there is insufficient foundation upon which to start. When there is a notable depression due to battering, welding will prevent excessive pounding and will be less costly as well as giving better results if done immediately rather than if put off until loosening of the hard center or other failures occur.

Determining Penetration of Wood Preservatives

THE effectiveness of any wood preservation treatment is measured very largely by the depth to which the preservative penetrates. This can be determined by the following tests, which are used by the U. S. Forest Products Laboratory, Madison, Wis.

The presence of creosote oil is indicated by the dark discoloration, and the degree of penetration may readily be determined by taking a sample at a point free from checks and other imperfections and at a considerable distance from the end. This may be done either with an ordinary ½-in. bit, or with an increment borer, which brings out a core of wood that shows in cross-section the depth of penetration and is easily examined. The observation should be made at once, because the oil spreads rapidly over the cut surface. In order to prevent infection, the hole in the treated piece should be tightly closed with a creosoted plug.

As zinc chloride is colorless, the depth of penetration of this preservative must be ascertained by chemical means. After cutting the stick in two or getting a sample with the increment borer, the freshly cut surface is dipped for not to exceed ten seconds in a 1 per cent solution of potassium ferrocyanide, and the excess solution is removed by blotting paper. The sample is then dipped into a 1 per cent solution of uranium acetate, and dried. The treated portions will be whiter than the natural wood, and those untreated will have a dark red or a maroon color. This method does not give very sharp contrasts on wood which is reddish in color, like red oak, but otherwise is very satisfactory and affords a permanent record.

Another method (developed by Galen Wood) consists in spraying over the freshly cut surface a mixture of equal parts of a 1 per cent potassium ferrocyanide solution, a 1 per cent potassium iodide solution and a 5 per cent solution of soluble starch. This colors the treated portion a very dark blue, but does not affect the untreated wood. Although the color fades in time, it may be brought back by spraying again.

Sodium fluoride is colorless, and no satisfactory method of showing its presence in wood has been devised.

Mercuric chloride is also colorless, but dipping the wood in a solution of hydrogen sulphide turns the treated area black.

As individual pieces may show an abnormally high or low degree of penetration, sufficient number of tests should be made to obtain a fair average. Samples should be taken at a considerable distance from the ends of the stick, in order that they will not be affected by the heavy longitudinal penetration from the ends.

Tighten Commutators Under Pressure While Hot

A TYPOGRAPHICAL error occurred in the article by John S. Dean on "Revamping Old Railway Motors," which was published in the April 15 issue of ELECTRIC RAILWAY JOURNAL. The original manuscript read: "Care should be taken to tighten the commutator while hot and under pressure." As published the word "hot" appeared as "not," so that the sentence read "tighten commutator while not under pressure." The Westinghouse Electric & Manufacturing Company has advised that it strongly advocates the tightening of

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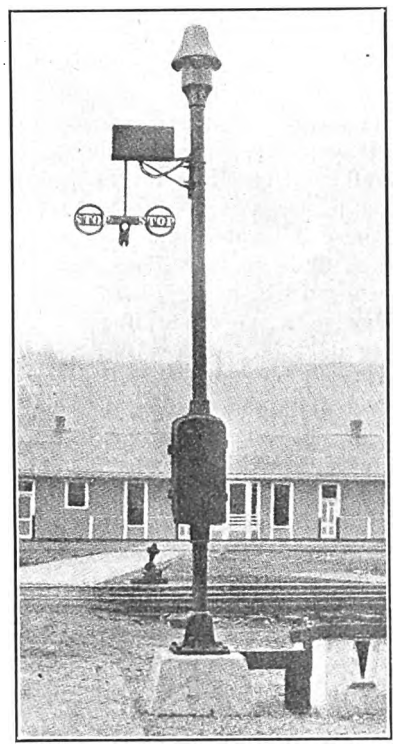
commutators while they are hot and at the same time while they are under pressure, as experience has shown that more satisfactory results are obtained if this method is followed.

What's New from the Manufacturers

Safety Crossing Signal

THE accompanying illustration shows an installation of the Adler safety crossing signal. It consists of two disks mounted on opposite sides of a vertical shaft and suspended above the highway. Normally when the crossing is clear the disks are held with their edges to the highway by an energized magnet. On the approach of a train the magnet is de-energized and the vertical shaft revolves through an angle of 90 deg. by gravity and the disks face the highway. Supplemental to the disks are hooded red lamps which flash on the approach of a train. These lamps flash about sixty times a minute and, due to the fact that the filaments have no time to cool off, there is always a glow in the lamp during the interval between flashes. The period of illumination is considerably longer than the period of semi-darkness. The design of the banner is similar to the traffic semaphores used by police departments in most large cities.



CROSSING EQUIPPED WITH SAFETY CROSSING SIGNAL

The mechanism consists of a crank which is connected to the upper end of the vertical shaft, on one side of which is connected a solenoid and magnet and on the other side a counterbalancing adjustable weight. The solenoid upon being energized turns the shaft so as to clear the signal, and the signal when clear is held in that position by a high resistance magnet, which when de-energized allows the signal to turn to "stop" by action of the counterweight. Thus in case of failure the signal will assume its "danger" position.

The operation is as follows: The flashing light operating on an open circuit is connected to its electrical source through the back contact of a track relay. The solenoid and magnet controlling the banner, which operate on a closed circuit so as to display the warning by gravity, is connected to the same electrical source through the front contact of the track relay. An approaching train, de-energizing the relay, will cause the banner to be displayed by cutting off the current from the holding magnet, and at the same time the flashing light will be displayed by making a connection from the electrical source to the lamps through the back contact of the relay. In addition to this method of operation, the signal can also be controlled by trolley contactors or by track instruments. Ball bearings are used throughout and all working parts are inclosed.

Venting Protection for Renewable Fuses

RELIABILITY in renewable fuse construction has been sought through the development of a fuse with the Shurvent construction by engineers of the Westinghouse Electric & Manufacturing Company. This construction acts on the principle of baffles and retards the flow of gas sufficiently to maintain enough pressure within the cartridge to extinguish the arc, and it also allows the gases to leave the fuse only after they have been cooled to a temperature that eliminates hazard of fire or of personal injury.

Shurvent fuses have a series of fixed washers at each end of the casing. These washers are channeled to form air chambers and they are connected to the inside of the casing, to each other and to the outer air by staggered openings. The hot gases follow these courses more readily than along the threads, but they will be retarded sufficiently to accomplish two purposes—effective quenching of the arc in the casing, without damage to the casing itself, and cooling of the gases so that they will leave the fuse at a safe temperature.

In the knife-blade type the links are solidly bolted to the copper terminals. In the ferrule type fuse the only parts to be removed for renewal are a cap and a washer from each end, while only one ferrule and the loosening of the screws at the other end are necessary in the renewal of the knife-blade type. These screws are permanently fastened to the end washers so that they cannot be dropped and lost.

New Air Gun for Maintenance Work

A NEW brass air gun has recently been placed on the market by Jenkins Brothers, New York, manufacturers of valves. Special attention has been given in the construction details to prevent air leakage. A renewable disk with which the air gun is fitted is made to form a perfect contact on the seat and takes up the wear of frequent usage.

AIR GUN FOR BLOWING OFF EQUIPMENT

This type of air gun is suitable for blowing off various pieces of electric railway equipment, such as motors, controllers, and the like, as well as for blowing off chips, filings and trimmings, etc., in machine shops and woodworking mills, and everywhere that a blast of air is required.

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Economics of Car Maintenance Through Modern Shop Practice*

Equipment and Methods Which Were Found to Be Successful by the Texas Electric Railway Are Described and S ome Costs of Maintenance Are Given

BY WALTER SILVUS
Superintendent of Equipment Texas Electric Railway, Dallas, Tex.

A VERY important fact in economical maintenance is efficient, careful inspection, preferably on a mileage basis, but if this is impracticable, on a daily, weekly or semi-weekly basis. This work can be taken care of much better by the day crew than at night, the difference of efficiency being fully 25 per cent. Ideal shop layouts are a myth, never just what we would like, and it is necessary to make the best of existing conditions, improving them as money becomes available for this purpose. However, there are a few pieces of equipment which are indispensable on a medium-sized property if we would make a good showing in our maintenance work.

One of the most important pieces of equipment which can be installed in a shop is an electrically operated box crane spanning the repair tracks and serving all the machines. This should be of such capacity as to lift one end of the heaviest cars, so as to remove the truck, carry the trucks and motors to any part of the shop where it is most convenient to make repairs and handle axles, wheels, armatures and all heavy materials brought in for machining.

A machine not usually found in railway shops which I consider a strong link in the chain of economy is a motor-driven wheel grinder using two 4 in. x 24 in. carborundum wheels. This machine will remove a 2-in. flat spot from a pair of cast wheels in three-quarters of an hour and true up the tread and flanges on steel wheels in from one to three hours. It does not require a skilled operator and can be operated in connection with another machine, which makes the labor cost very low. One pair of grinding wheels will grind from 100 to 120 pairs of wheels. The use of this machine in connection with the electric welder has enabled us to get 1,000,000 car-miles out of our 37-in. steel wheels. These wheels have been in service eight and one-half years and some of them have already made more than 700,000 miles. The rolling movement of the wheel tread against the rail and the action of the brake shoes against the tread and flange create a very hard wearing surface which the carborundum grinding wheel does not destroy, while the lathe tool must necessarily go beneath this hard surface and remove from $\frac{5}{8}$ to $\frac{3}{4}$ in. of metal in order to build up a full flange.

The electric welding machine is a money saver. For this particular line of work we have secured the best results with a motor-driven, 20-60-volt, 200-amp. generator mounted on a truck, so that it can be moved to any part of the shop or yard. With this machine we build up the flanges on steel wheels and grind them to their original contour, build up worn-out knuckles and make them last almost indefinitely, weld broken coupler heads, build up axle collars and pinion fits on armature shafts, patch and weld gear cases, brake heads, axle caps, journal boxes, trolley poles, truck and motor frames and many other parts of the car, frequently without removing the part, thus saving the cost of a new part plus the expense of removal and replacement.

Bronze bearings and malleable iron can be handled more successfully with the oxyacetylene outfit, although the expense is greater and it is not as desirable on account of the extra hazard. Both of these appliances have their limits, but if once used around the shop they will be found almost indispensable thereafter.

The installation of a universal, motor-driven, punch, shear, bar, tee and angle cutter, capable of shearing $\frac{7}{8}$-in. plate, cutting 2-in. bars, $4\frac{1}{2}$-in. angles and 4-in. tees and punching $1\frac{3}{8}$-in. holes in $\frac{7}{8}$-in. plate resulted in an actual saving of $10.80 per day on our payroll and in addition enabled us to handle considerable track material which had formerly been taken to outside shops. One paving job we have in mind, requiring the use of 5,300 tie plates, showed a saving of $556.50.

TOOLS FOR WORKING SHEET METAL USEFUL

Since the advent of the steel car, machinery and tools for working sheet metal are almost indispensable, but we find very few electric railway shops with this equipment. The equipment for a moderate sized shop should consist ordinarily of a combination splitting shear and punch, square shear, rolls, crimping and beading machine, folder, brake, drill press with detachable electric drill and a varied assortment of hand tools suitable for this class of work. Tools and machines of this kind are very essential for the repair and manufacture of water coolers, ventilators, smoke jacks, toilet accessories, water pails, oil cans, signs, metal dashes, side sheets, etc.

A system operating 100 cars or more should have the usual complement of lathes, drill presses, boring mill, wheel press, bolt and pipe threader, power or steam hammer, shaper, emery grinders, woodworking machines, electric and air drills, riveting hammer, air compressor, and if special trackwork is built or repaired to any extent a planer and milling machine can be used to good advantage. A generous assortment of good serviceable hand tools is just as essential as good machines; it is the poorest kind of economy to compel workmen to use wornout tools or tools unsuited to the work.

A great many articles have been published in recent years in regard to dipping railway armatures and motors in insulating paint and varnishes. For the past eight years we have used a shop-made paint-spraying machine for the purpose of spraying insulating paint in the interior of motors and field coils and on armature windings and cables. We believe it is possible to coat these parts in this manner and get a better penetration than with any other method, as the operator is enabled to force the paint into any part of the motor he desires and in any quantity. Motor frames and armatures treated in this manner do not hold the dust like those not treated and any dirt accumulating in the motors between inspection periods is very easily blown out by compressed air.

The cost of painting car bodies can be brought back to a pre-war basis by the use of paint-spraying machines and enamel paints for exteriors and ceilings of cars. A change from flat colors, varnish and brush to the enamel system requires constant supervision at the beginning, as the painters do not take readily to it for various reasons. In the first place it upsets their old theories and practice of car painting and secondly the enamel is more difficult to apply than flat colors and varnish and to the painter's eye the car does not present as good an appearance when completed as if painted by the old system. It has been demonstrated to our satisfaction that an enameled job, either on steel or wooden cars, furnishes better protection to the surface and looks better at the end of two years service than a flat color and varnish job at the end of one year. When the enamel system is used it is not practicable to use gold leaf, but 40 cents worth of imitation gold striping color will take the place of $15 worth of gold leaf and ninety-nine persons out of a hundred who ride the car will not notice the difference.

An apprentice boy can learn to operate a paint-spraying machine in a few hours and with a few days practice can do as good work as a high-salaried painter. Priming coats, which in our opinion are the most important of any applied to the car, can be put on more effectively with a machine than with a brush as the spray gives a better penetration than a brush in the cracks and nail holes, therefore holding the putty and surfacer much better than with the brush method. The following coats can be applied as satisfactorily as with the brush with a saving of approximately 50 per cent in labor:

For a burned-off job it is our practice to give the car a priming coat, puttying the nail holes and cracks the day following; to give it a second coat of flat lead the third day, followed up with one or two coats of surfacer, brushed on as heavy as it can be

*Abstract of a paper presented at the meeting of the Southwestern Electrical and Gas Association, San Antonio, Tex., May 3-6, 1922.

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handled and smoothed out with a glazing knife. When sanded down this is followed by two coats of color enamel, numbered, lettered and given one coat of clear enamel. Five of the seven coats are put on with a paint-spraying machine.

In order to get good results through the use of the sprayer it is necessary to keep the enamel paints at a temperature above 75 deg. while in use. The compressed air must also be free from moisture and oil. These machines are very useful for spraying under trolley boards, roof mats, steps, pilots, trucks, couplers, tanks, etc., requiring only a fraction of the time that would be required if done with a brush.

A slight loss of material is sustained by the use of the spraying machine which is unavoidable, but a greater loss (approximately 6 per cent) in the average paint shop is due to the paints and varnishes drying up when left exposed to the atmosphere. These skins and leftovers can be reclaimed at a slight cost by the use of a grinder costing less than $25, which can be bolted to the line shaft and run when a sufficient amount of material has accumulated. It requires no attention other than filling and emptying the containers and the product is suitable for the use of the carpenters on all concealed work, floors, mortises, etc.

USE PLENTY OF LUBRICANT

If any extravagance in the business is justified we believe it is in the lubrication of cars. Hot boxes are usually ascribed to lack of oil, but whatever may be the cause they are very exasperating both to passengers and operating men. Delays due to this cause result in a direct loss in revenues and are not a good advertisement for the service. Extravagance should not be carried so far as oiling the right-of-way by oil dripping from the boxes, but the proper amount of lubricants should be determined for each class of equipment and the oiling periods spaced so as to eliminate this trouble as far as possible.

Appliances for saturating packing around carhouses and shops as a rule are subject to improvement. In order to saturate waste properly and drain the surplus oil out of it it is necessary to bring the temperature of the oil to about 175 deg. Steam heat is not usually available for this purpose, but a hot water heater can be bought at slight expense and connected to the vats by suitable coils and pipes and will be found very satisfactory. Two vats should be provided, one for saturating new and one for old packing. This equipment, combined with a good filter, will aid materially in reducing the bearing, babbitt and lubrication expenses.

In this connection we have used no tin-base babbitt metal for the past five years. We believe we get just as good service out of a lead-base metal on our heavy motors as we formerly did with a tin-base metal costing more than twice as much.

Gear replacements on some railways are an expensive item in the maintenance column. Gears properly lubricated should last as long as the motors. We have in service gears and pinions on our heavy interurban cars which have been running since 1911. They are still in excellent condition, although for a period of two or three years we had in use a very poor quality of gear lubricant.

First Meeting of Committee on Welded Rail Joints

THE committee on welded rail joints, organized recently under the auspices of the American Bureau of Welding, held its first meeting at the United Engineering Societies Building, New York City, on May 10. The organization of this committee was undertaken, at the request of the committee on way matters of the American Electric Railway Engineering Association, by the Bureau of Welding. This body is the advisory committee on welding research and standardization of the American Welding Society and of the Division of Engineering of the National Research Council.

At the New York meeting the chairman, Prof. G. K. Burgess, Bureau of Standards, Washington, D. C., presided, and the importance of the work of the committee and the interest displayed therein were attested by the large attendance, some twenty-four members out of a total of thirty-seven being present. Those in attendance, in addition to the chairman, were: E. M. T. Ryder, vice-chairman; William Spraragen, secretary; R. C. Cram and H. M. Steward, members of executive committee, and F. L. Abbott, H. P. Bovard, Alex. Churchward, C. H. Clark, G. E. Doan, Prof. D. D. Ewing, C. F. Gailor, H. H. George, C. H. Jewett, H. F. A. Kleinschmidt, E. J. McIlraith, E. C. Price, H. W. Pinkerton, H. J. Tippett, E. Vom Steeg, A. P. Way, W. W. Wysor, G. L. Wilson and F. A. Weymouth.

The meeting approved the action of the American Bureau of Welding in its appointment of the chairman, vice-chairman, secretary and executive committee, who have served during the preliminary organization period. The following officers were elected to serve for the ensuing year: Prof. G. K. Burgess, chairman; E. M. T. Ryder, vice-chairman; William Spraragen, secretary; C. A. Adams, R. C. Cram, E. J. McIlraith, H. M. Steward, G. L. Wilson and W. W. Wysor, executive committee.

The vice-chairman reviewed the progress made to date and presented Progress Report No. 1, which contained a printed summary of the replies made by the members to the four inquiry schedules covering information on the state of the art and investigations to be undertaken in each of the following types of rail joints: Cast iron-welded joints, electric resistance-welded joints (bar welds and butt welds), electric-seam-welded joints (carbon electrode and metallic electrode), and thermit-welded joints.

Discussion of each of these types of joints was introduced by members previously selected to lead the discussion and the particular features of each joint which seem to need further study were brought out in the general discussion. The various tests which may be necessary to compare the relative merits of the joints were then considered and it was concluded that each type of joint should be made up with the use of Association Standard 7-in. grooved girder rail, Class B, and that three test specimens of each type of joint should be prepared by users and by manufacturers. The following tests are to be made to destruction: tensile test, drop test and cross bending test.

A plan of a proposed rotary service testing machine was presented by W. W. Wysor, together with an estimate of its cost and the cost of operation. The proposed machine would cost about $14,000 to build and operate for one year. With this machine, accelerated wear tests of joints could be conducted and within a few months the wear of several years could be effected. The development of such a device, or some other service testing apparatus, involves the question of finance. Further consideration of the matter was left to the executive committee.

Mr. McIlraith presented plans of a proposed impact testing apparatus for testing full sized specimens, having rail heads planed down to simulate several years of wear. Prof. Ewing called attention to a device which had been used for somewhat similar tests at Purdue University, and which might be available for some of the desired tests. The executive committee is to investigate the apparatus and test methods and formulate plans following the receipt of information as to available funds.

All members agreed to prepare full-sized test specimens, and manufacturers' representatives stated their belief that the rail needed would be furnished by their companies. A tentative budget of the expenses of the committee for one year shows the need for at least $15,000 and the members were requested to advise the secretary within the next two weeks as to what financial assistance the committee might expect from the companies represented. It is hoped by the committee that all of the companies will agree to contribute a pro rata share of the annual expense as the benefits to be derived from having authoritative information on the welded rail joint problem should be worth untold sums to each company.

Tie Spacing in Fort Worth

IN THE abstract, printed in the May 6 issue of the ELECTRIC RAILWAY JOURNAL, of the paper read by R. G. Taber, at the San Antonio meeting of the Southwestern Electrical & Gas Association, an error appeared in Table II on page 756. The number of ties per mile should be 2,650 instead of 2,262.

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California E.R.A. Elects New Officers

AT THE annual meeting of the California Electric Railway Association, held in San Francisco on May 8, the following officers were elected for the ensuing year: President, W. E. Dunn, vice-president Los Angeles Railway Corporation; vice-president, William von Phul, president Market Street Railway; executive board, W. E. Dunn, W. R. Alberger, William von Phul, Paul Shoup and John A. Britton. W. V. Hill continues as manager.

A resolution signed by all present expressed to Mr. Alberger, the retiring president, their "very great appreciation of his direction of affairs of the association during the most troublesome period of the history of the electric lines of California."

There was a tone of optimism in the discussions, centering around the fact that, in spite of increased operation costs, burdensome franchise requirements and jitney competition, there have been no receiverships during the past few years.

New England Street Railway Club

THE May meeting of the New England Street Railway Club will be held at Manchester, N. H., on May 25, 1922, to observe the fiftieth anniversary in the street railway industry of E. C. Foster, president Manchester Traction, Light & Power Company.

There will be a trip by trolley cars around Manchester in the morning. In the afternoon there will be a meeting at the Massabesic Lake Theater, at which Frank E. Webster, vice-president and treasurer Massachusetts Northeastern Street Railway, will read a paper on "History of Street Railways and Power Development in New Hampshire." This paper will be followed by a musical comedy.

New Jersey Utilities Prints Mr. Baker's Paper

ONE of the interesting papers at the last convention of the New Jersey Utilities Association, held in Atlantic City, Nov. 18-19, 1921, was read by Ralph J. Baker of Harrisburg, Pa., on "The Right to Judicial Review of Commission Action." The association voted to print the paper and copies are now available in the form of a pamphlet of 44 pages.

Mr. Baker first discusses the historical basis of regulating commissions and their status in law and in government. On this point he declares that the American system of government was long considered as divided into three branches, the judicial, the executive and the legislative. If these are regarded as completing the cycle, commission government can be considered as belonging to the executive branch. Practically, however, it partakes so much of the features of all of the other three, and yet is none of them, that Mr. Baker thinks it could well be assigned a distinct position.

In his review, the author also considers whether the legislature may confer upon the commission the power to determine whether its own rates are confiscatory, and in general the extent to which federal and state courts may review the question of whether they are reasonable.

Meeting of Chamber of Commerce

THE tenth annual meeting of the Chamber of Commerce of the United States was held in Washington this week beginning on Tuesday and concluding on Thursday. General sessions were held in the morning and in the afternoon there were sectional meetings of the following groups: Civic development, domestic distribution, fabricated production, finance, foreign commerce, insurance, natural resources production, transportation and communications.

The subject of the meeting as a whole was "European Conditions and Their Effect on American Business" and most of the addresses were on some phase of this subjct. The speakers included President Harding, Secretaries Hughes and Hoover and many men prominent in industrial finance and railroad work. The American Electric Railway Association was represented at the meeting by a delegation with L. S. Storrs as chairman. As this paper has to go to press while the final session is in progress, the results of the election cannot be given until next week. The council nomination for director of the National Chamber of Commerce from the fifth district included John W. Shartel, vice-president Oklahoma Railway.

Practically all of the speakers at the convention stressed the close relation between American business and the European financial situation. These recommendations included stabilization of exchange, adjustments of the budgets of the nations of Europe so as to make the income equal to the outgo, definite settlement of the German reparation question and the return to normal business conditions in Russia. The speakers in general declared business conditions in this country to be on the upgrade.

Statistics on Prices, Wages and Fares

A CHART showing the fluctuation in wages, railway fares and the wholesale prices of commodities formed part of a paper presented at Nashua, N. H., on March 16 before the Merchants' Association, Rotary Club and other organizations in that city by Walter H. Burke of Stone & Webster. The chart is reproduced on this page.

The address by Mr. Burke was an informal one but put in clear language the predicament of the electric railways brought about through the higher cost of materials and labor and only a slightly increasing average fare. He also pointed out the evils of jitney competition.

In commenting upon the need for more capital in the industry, Mr. Burke said that in normal pre-war times about $250,000,000 a year had been estimated as the amount required, in addition to that needed to meet maturing obligations. With construction costs 50 per cent higher in the future and with the large amount of work which the companies should have done during the past six years but could not finance, he said the amount now needed was possibly twice as great as that just quoted. In the interests of all, a considerable part of this at least should be raised by the sale of common stock, rather than by the sale of senior securities.

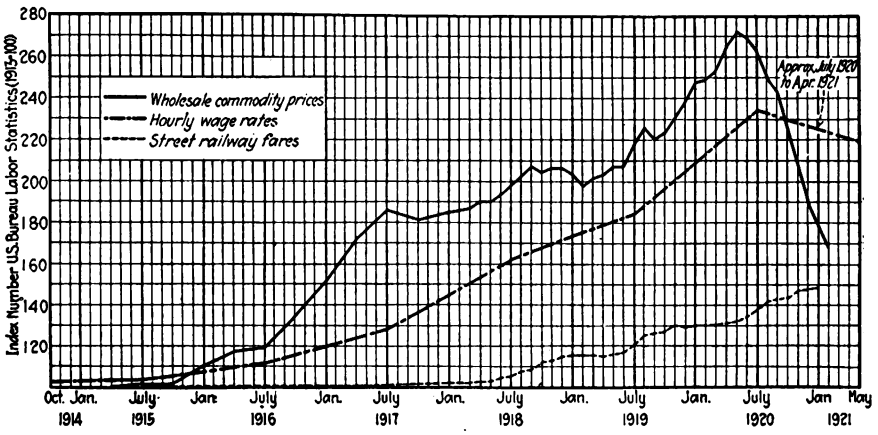

CHART SHOWING CHANGES IN WHOLESALE COMMODITY PRICES, HOURLY WAGE RATES AND STREET RAILWAY FARES

American Association News

High-Water Mark at Hartford

THE Connecticut Company section held its May meeting at Hartford on the eleventh. The meeting began at 5 p.m. in the Wethersfield Avenue carhouse with an open-air concert by the Connecticut Company Section Band. Next a dinner, prepared by the ladies of the Hartford Division, was served to 248 persons in the carhouse auditorium.

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After dinner S. W. Baldwin introduced Mayor Kinsella of Hartford, who compared former with present day car service, which he stated was in general very satisfactory.

Then came short talks by the following: N. J. Scott, who reviewed his first year's work as manager of the Hartford Division; Ralph Martin, traffic engineer, who spoke on "Checking of Traffic by Street Observation"; H. Jackson Tippet, division engineer, and F. P. McKaig, roadmaster, of the Hartford Division, who spoke on "The History of Track and Pavement Construction"; Leslie Spraggon, supervisor of equipment, whose subject was "Railway Equipment and Shop Efficiency"; Joseph F. Berry, formerly attorney for the company, who related some amusing court experiences, and L. S. Storrs, president of the company, who emphasized the slogan: "Better Service for the Public."

Way Committee's Third Meeting

THE Engineering Association committee on way matters met in New York City on May 11 and 12. Vice-Chairman H. H. George presided. Present also were C. A. Alden, V. Angerer, S. Clay Baker, R. C. Cram, W. R. Dunham, Jr., E. B. Entwisle, H. Fort Flowers, C. F. Gailor, E. P. Roundey, F. Tingley, W. W. Wysor, C. H. Clark, G. E. Doan, H. F. Heyl, E. J. McIlraith, H. M. Steward and George L. Wilson. The topics considered were as follows:

The sub-committee on curved contours for wheels presented with its report several drawings illustrating its views with respect to its proposed compound fillet connecting the tread and flange. These will be included in the final report, together with a monograph, by Mr. Flowers, on the theoretical and practical questions involved. This sub-committee also reported (with drawings) on proposed flanges having a uniform thickness compared with those with graduated thicknesses. Conference with the equipment committee had indicated a belief that the proposed flanges are impracticable from the manufacturing standpoint.

On arc-welded joints, a sub-committee explained the results of the research made in conjunction with the committee on welded rail joints (see report on page 834, which showed that there is no uniform method of making arc-weld joints. Plans for a testing machine, with cost estimates, was presented by Mr. Wysor, and they were in general approved. Copies of "Progress Report No. 1" of the committee on welded rail joints were distributed by Mr. Ryder. Messrs. McIlraith and Doan also discussed the subject of fatigue tests of metals as applied to welded joints.

Under the topic of wood preservation a modification in the recommended specifications for creosote oil made last March by the A.R.E.A. was recommended for adoption in the similar specifications recently adopted by the Engineering Association.

Under "revision of specifications for girder rails" reports presented indicated that the committee's proposed substitution of the impression test for the drop test is practicable.

No action was taken with respect to standardization of branch-off frogs.

The sub-committee on electrolysis next presented a report which was accepted.

As to a tie-rod specification, one which was proposed was referred back to a sub-committee for revision.

On substitute ties a progress report was presented with a recommendation that the subject be continued next year.

The last topic discussed was co-operation with the American Society for Municipal Improvements on the design of track construction for paved streets. So far a meeting of the committees concerned has not been arranged.

The committee adjourned to meet, probably, in Quebec, on June 1 and 2. Following the meeting the committee witnessed a demonstration in Jersey City of thermit welding of rail joints done in accordance with a new procedure which the manufacturers have perfected.

Educational Syllabus Planned

THE outstanding feature of the meeting of the American Association committee on education, held in New York City on May 15, was the following: It was agreed that the report for this year should consist of an outline of a complete educational program for an electric railway property. This will follow the topics listed in a questionnaire recently sent to all company members. The several subtopics will be treated by different members of the committee.

Another item considered was the publication in *Aera* of a series of "theses" prepared by members of the committee, each giving his own point of view with regard to the subject. A number of these "theses" were presented at the meeting. Examples of these are given in brief abstract below:

One member presented a complete outline of co-operative courses for assisting men already employed, and for training electric railway executives by giving college men practical training during their student days. This plan is proposed by the Massachusetts Institute of Technology. It comprises two parts: (1) For the skilled workman and minor executives, a two-year evening course entitled "The Lowell Institute Course for Industrial Foremen." (2) For the training of higher executives, a five-year co-operative course for electric railway engineers.

The first of these offers to men employed during the day with electric traction companies, and already familiar with practical details, the advantage of scientific instruction in the fundamentals of electrical engineering. The second course will be similar to the co-operative courses already in successful operation for training electrical engineers for manufacturing industries and large power companies.

Another "thesis" summarized the situation as follows:

Like all great industries, the electric railways of the country have for many years felt that they should do something to insure a better quality of new recruits for the several branches of the business and also to train those already in the service more effectively to perform their duties. Obviously this is a broad field for endeavor, and results can be secured only if there is intense conviction as to the needs for educational activity, and a capable personnel behind the movement.

The American Electric Railway Association has appointed a committee on education to act as a clearing house for information as to what has been done and is being done along educational lines by electric railways, and to formulate plans which will be helpful in furthering this essential work. The efforts of the committee can succeed only if there is enthusiastic co-operation all along the line.

This phase of the work of electric railways naturally divides itself into the following parts:

(a) Co-operation with educational institutions, technical and otherwise, with a view to letting young men know about the opportunities in the electric railway field, and encouraging the offering of such courses of instruction as will best fit young men for this field.

(b) The training of young men who have been accepted for employment by the electric railways with a view to enabling them to become adapted to their duties promptly and to fit them for promotion.

(c) Teaching the various trades which are represented in electric railway operating practice.

Previous educational committees of the American Electric Railway Association have attempted to do work along all of these lines, although in general not in a comprehensive way covering the whole situation. At one time a cadet system for engineering graduates was recommended, and it was tried out on a considerable scale by one or more railways with good success. Another year a correspondence course was conducted.

This year the plan is to prepare a report which will "give a cross-section" of the educational work of the electric railways of the country. That the work is important no one will deny. The practical problem is how to get the required co-operation.

The New York meeting was attended by these members: Edward Dana, general manager Boston Elevated Railway, chairman; T. S. Wheelwright, Richmond, Va.; W. H. Timbie, Boston; M. B. Lambert, Pittsburgh; E. J. Blair, Chicago, and H. H. Norris, New York.

Chamber of Commerce Delegates

THE American Electric Railway Association is a member of the Chamber of Commerce of the United States, and is entitled to send ten delegates to the annual meeting of the chamber. Although there were on the program of the chamber this year no papers of direct railway interest, President Todd appointed ten delegates to represent the association at the annual meeting in Washington this week and an equal number of alternates. A meeting of these representatives was held at the Washington office of the association on May 16. Those present included L. S. Storrs, chairman of the committee, and Edward Dana, Boston; J. N. Shannahan, Hampton, Va.; E. J. Blair, Chicago; John N. Hanna, Washington; W. J. Harvie, Syracuse; Calvert Townley, New York; K. A. Simmon, Pittsburgh; Charles C. Peirce, Boston; H. W. Blake, New York, and L. T. Blaisdell, Washington, representing J. R. Lovejoy, New York. These representatives attended meeting of the national chamber and will present a report upon the meetings to the executive committee of the Association.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

$400,000 for Improvements

Saginaw Lines Would Be Rehabilitated Under Franchise Plan Now Before Council

Reorganization of the Saginaw-Bay City Railway, in the bankruptcy courts since Aug. 10 last year, is proposed through the granting of a twenty-five-year franchise to the trustee, Otto Schupp, as far as Saginaw is concerned.

The members of the Council conferred on May 16 with Mr. Schupp and it was practically decided that before anything further is done, the citizens transportation committee, which made a demand on Feb. 14 for the resumption of electric railway service, present to the Council an initiatory petition calling for a submission of the franchise to the electors.

There are five main points in the proposed franchise as follows: Time of grant, twenty-five years; the rate of fare, twenty tickets for $1, four tickets for twenty-five cents, 10-cent cash fare; universal transfers, motor bus auxiliary and elimination of all competition. The company is to be relieved of paving requirements except the necessary ballast in the roadbed because of the use of the streets for cars.

Proposed Plan Is the Best Possible, Says Schupp

The reorganization of the company, Mr. Schupp said, contemplated the issuance of 10,000 shares of common stock of no par value, the issuance of $584,000 of first mortgage 5 per cent bonds to replace outstanding Saginaw Valley Traction Company bonds, and additional bonds in an amount sufficient to rehabilitate the property and purchase buses to serve factory districts not touched by electric railway extensions at the present time.

The proposed new company would be operated by the Commonwealth Power, Railway & Light Company, Mr. Schupp said, independent of any of the present local utilities owned by that organization. He even went so far as to say, "in offices apart from their present quarters."

The entire plan is for Saginaw only, and Mr. Schupp told the Council that the new company proposed to spend at least $400,000 in betterments and in repairing the present right-of-way and the installation of new trackage in two main streets this year and one next year.

Settlement of the question, which has been before the city since the suspension of railway service, is necessary now because of the paving program of the department of public works, which includes a trunk line road that has been made a Federal and state aid project, from Hartsuff Street at Genesee Avenue to the southerly city limits, a distance of more than a mile. Under the plan the outside sources pay for 20 ft. of the pavement. The city is very anxious to secure this assistance. For more than half the distance the tracks of the company run along the side of the street and the state and Federal engineers want the tracks placed in the center of the road.

In discussing the various phases of the question, Mr. Schupp said the proposed franchise was the best possible if those who were putting their money into the venture were to get anything back and "they told me," said Mr. Schupp, "when I was in New York if the deal did not go through to close up the property."

Employees Suggest Wage Cut—Company Refuses to Accept

The employees of the Paducah (Ky.) Railway recently volunteered to accept a reduction in the existing scale of wages which has been in effect since the war. The company is managed by Stone & Webster, Inc., who also operate the Paducah Electric Company. It has been the practice of the management to inform the men each month of the financial result of the operation of the property and to pursue a policy that will thoroughly acquaint the men with the problems of operating a street railway.

Lately, due to the business depression, the earnings of all the lines of the system have fallen considerably below those of the same period last year. The loss in revenue was a matter of discussion at the weekly meetings of the men. The company did not accept the offer of its men for the reason that it feels the present depression is more or less temporary and with such splendid co-operation it hopes soon to regain a measure of prosperity.

Supreme Court Remands Covington Case

In the United States Supreme Court on May 15 Justice McReynolds handed down a decision reversing the action of the District Court for the Eastern District of Kentucky in the case of the South Covington & Cincinnati Street Railway vs. the City of Newport, Ky. In this case the city of Newport ordered the railway to remove overhead cables. The railway resisted, contending that the order was unconstitutional as it impaired its obligations under its contract with the city and taxed its property without due process of law. The District Court dismissed the action for want of jurisdiction, but the Supreme Court in the McReynolds decision reversed this action and remanded the case to the Kentucky court for further proceedings.

New Schedule Accepted

Boston Elevated Cuts Wages Two Cents on July 1 and Two Cents on Jan. 1 Next

Members of the carmen's union of Boston, Mass., have accepted a cut in wages amounting to 2 cents for six months from July 1 to Jan. 1, 1923, and 2 cents more from Jan. 1 to July 1, 1923. In his announcement General Manager Dana of the Boston Elevated said that the board of trustees amicably adjusted the wages upon the same principles as those upon which the adjustment was made a year ago and that the trustees have been assured of the continued co-operation of the employees affected in the effort to operate the system efficiently and economically in the interests of the car riders. These principles, upon which the cut was made, follow:

1. The fact that although a substantial decrease has already taken place in many items affecting the cost of living, that cost is not yet upon any settled basis, so that it is peculiarly a fitting time to put in practice the belief of the trustees that to be consistent they should be as deliberate and conservative in following the cost of living when it is upon a downward trend as in following it when it is in an upward movement.
2. The fact that they thoroughly appreciate the co-operation that the men have given to the management during the past year. The existence of this spirit has financial as well as other value in the conduct of this service.
3. The fact that as public officials they are in charge of a public business and should be careful not to follow any other rule than that of a full fair wage for work that is earnestly performed.

The new schedule of pay for the men in the employ as stated officially in an announcement of the company in cents per hour is as follows:

CONDUCTORS' AND MOTORMEN'S RATES

		Present	July 1, 1922 to Jan. 1, 1923	Jan. 1 to July 1 1923
Minimum	three months	52	50	48
Intermediate	nine months	58	56	54
Maximum	thereafter	65	63	61
ELEVATED MOTORMEN'S RATES				
Minimum	three months	61	59	57
Intermediate	nine months	62	60	58
Maximum	thereafter	67	65	63
ELEVATED GUARDS' RATES				
Minimum	three months	56	54	52
Intermediate	nine months	57	55	53
Maximum	thereafter	60	58	56

Mr. Dana's statement says that the maximum rate for conductors and motormen on July 1, 1922, will be 63 cents and on Jan. 1, 1923, 61 cents. The basic rate reached on Jan. 1, 1923, will be a maximum reduction of 6 per cent. A corresponding reduction will be made in all other rates. On the pay for one-man car operation he says that the differential rates paid to operators of one-man cars is reduced 20 per cent, the new rate being 8 cents an hour in addition to the regular rate.

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All Detroit Lines Now Municipally Owned

City Takes Over Entire Local System of D. U. R. Without Confusion—Department Heads of Municipal System Given Jurisdiction Over Enlarged System—D. U. R. Employees Taken Over Except About 200

AT 12:01 A.M. MAY 15, the railway system owned and operated by the Department of Street Railway, City of Detroit, was suddenly increased by purchase of the city lines of the D. U. R. from 90 to 363 miles of single track line, the number of cars was jumped from 428 to 1,457, and the 1,000 employees became 4,000, approximately. This significant change, marking the transition of a great private enterprise into a municipal undertaking, took place quietly and free from confusion as the hands of the clock passed the zero hour.

The innumerable details incident to the transfer had apparently been so thoroughly foreseen and prearranged for and the offices of the Department of Street Railways on that eventful day May 15, were so peaceful and calm that it was difficult to sense anything out of the ordinary in the course of that day's business.

Former D. U. R. Employees Now City Men

In general, Detroit United Railway employees engaged in the city service were largely taken over by the city except for department heads and those filling about two hundred other positions of various kinds and degree of importance. All department heads of the municipal system became the corresponding heads of the enlarged system and they received salary increases commensurate with their increased responsibilities. On the other hand, the D. U. R. department heads and sub-heads fared not so well, several resigning, others receiving substantial salary reductions and still others losing out altogether, as the scope of the system narrowed down to a strictly interurban property. The city attempted to take care of the D. U. R. employees just as far as practicable, bringing them over at the same or increased salary and wages.

In several trades the rate of wages was increased a few cents to equalize differences between the D. U. R. and municipal scales. Trainmen, for whom the D. U. R. had proposed a new reduction in wages, were transferred with the same working conditions and the same rate of wage (60-cent maximum) and assured there would be no change, at least for some time to come. As their seniority was by lines, they were placed on the boards in the same positions previously held. The municipal system was simply made one division of the whole, now comprising seven divisions, and named the Shoemaker division. All of the former division superintendents and assistant superintendents were retained in their positions. Simultaneously with the transfer of the property on the morning of May 15, thirty-six new car schedules were placed in effect and one important route extension was made. Various other schedule and route changes are also contemplated in the near future for the general betterment of the transportation facilities, whereby ideas of the D. U. R. and municipal officials along this line will be put into effect. It is also contemplated that the Myrtle Street line will shortly be operated with one-man safety cars, sufficient cars of this type being available to replace the single-truck, two-man cars now used.

TERMS OF PURCHASE CONTRACT WITH PRIVATE COMPANY
Approved April 17, 1922
Effective May 15, 1922

Price	$19,850,000
Down payment	$2,770,000
Payment method:	
Bond issue of $4,000,000, authorized to make down payment and buy current stock of supplies.	
Installments, semi-annually	$500,000
Interest	6%
Balance	10 years
Tracks	273 miles, 90% paved
Cars	1,029
Real estate, value approximately	$8,000,000
Power stations:	
Two, furnishing 50% of total supply.	
Interurban rights:	
Running rates fixed by Board of Arbitration. Rights can be terminated on two years' notice.	
Total combined systems:	
Miles	363
Cars	1,457

Department Moved Bodily

One of the most difficult problems in connection with the property transfer was the moving of the department which receives, sorts and counts the receipts as turned in from the locked fare boxes. This department finished its work at the D. U. R. offices on the Sunday receipts, which belonged to the private company, at about 4 p.m. Monday. Between that time and 9 a.m. the following morning the three coin sorters and eight Satley coin counting and wrapping machines were moved to the new office building just being built for the department of street railways and set up and made ready for operation when the accounting department employees reported for work Tuesday morning, Monday's receipts belonging to the city.

It requires many thousand words in the legal documents to describe the property purchased by the city, but a general idea of it can be rather briefly summed up as follows: The city took over practically all the track and overhead within the city limits except that serving freight terminals and otherwise used in strictly interurban business. All freight terminals were retained by the D. U. R. The city received all substations, air stations, carhouses, battery stations and the two power houses. It received all of the Highland Park shops except the paint shop and the 15 acres of ground on which it stood, separated from the other buildings in the shop group by Third Avenue.

More Than 1,000 Cars Taken Over

The rolling stock purchased comprised 173 single-truck closed motor cars, 592 double-truck motor cars, 196 double-truck trailers and sixty-eight service cars, or a total of 1,029 cars. The city had previously taken over 105 double-truck motor cars and twenty-three double-truck trailers in connection with the purchase of 30 miles of the line built by the D. U. R. under the day-to-day agreement. This brings the total cars purchased from the D. U. R. up to 1,157, which, added to the 250 safety cars and fifty Peter Witt cars previously owned by the city, makes a grand total of 1,457 cars on the present system. The D. U. R. retained 170 single-truck closed cars, fifty double-truck trailers, eighteen double-truck motor cars and all single-truck open cars. The last named are being burned.

The retention of the paint shop by the D. U. R. will require the city to build a new paint shop and shop office and stores building (275 x 237 ft.) in the immediate future. There is ample ground space adjacent to the other shop buildings for this purpose. The second floor of the present paint shop is being fitted up to serve to house the general offices of the D. U. R., which will be moved from the interurban terminal building downtown to this outlying location immediately. A 150-ft. addition will be built in order to provide shop facilities adequate for the interurban system.

Catching Up With Deferred Maintenance a Problem

Among the immediate tasks of the municipal railway organization will be the work of picking up deferred maintenance on track, line, power facilities and rolling stock, for which a budget is being worked out. On rebuilding the worst portions of the property, the department officials will go to the limit of the financing arranged. For example, a rough survey indicates that from 12 to 15 miles of double-track overhead will have to be rebuilt at once. As to rolling stock, 200 new cars are needed immediately. The D. U. R. has purchased two-thirds of its power requirements from the Detroit Edison Com-

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pany. These contracts expire July 1, 1922, and the Edison company has declined to renew the agreement to supply all of the energy required. The municipal system has been buying all its energy from the Edison company and the Public Lighting Commission has exceeded its capacity and is also buying from the same source. Hence the power problem, taking into account these various requirements, is pressing and some plan will probably be devised within a month or two which will likely involve a new source of supply.

Thirty-Year Controversy Brought to an End

ONE is fairly lost in the moves and counter moves that have been made in the Detroit situation. For thirty years railway matters there have been in the public eye. Some day no doubt a historian will arise who will set down the record of events for posterity, but unless that historian is a disciple of the romantic school the product will be pretty dull reading. If the time is not too remote when this work is begun then a story ought to result that would be enthralling. The man who does the task, however, will need to get back of the facts to the persons who directed the various moves and disclose if he can the actuating motives. Perhaps some such account will be made available when the record of the life of Mayor "Jim" Couzens is written. Just now the problem is to sketch the outstanding moves in recent years, keep within reasonable bounds of space and guard this record from becoming dull and deadening.

Municipal Ownership Suggested Thirty Years Ago

Mayor Couzens had several forerunners in his campaign for municipal ownership in Detroit. Way back in the '90s none other than Tom L. Johnson, in conjunction with the late Mayor Hazen S. Pingree of Detroit, is discovered urging municipal ownership in Detroit. The necessary legislation for the purchase of the railway by the city was passed, and the bill was signed by the Governor. Prospects were pleasing for the accomplishment of this end, but the Supreme Court of Michigan declared the municipal ownership law to be unconstitutional. Then the holding company idea was hit upon, the proposal being for the city to buy the system and turn it over for private operation. The sale price was fixed at $16,000,000, but Mr. Johnson was accused of an attempt to bleed the city. In consequence of this the Council became frightened, the negotiations were broken off, and the ordinance permitted to die. There in brief is the record of what is believed to be the earliest attempt to accomplish the end which Mayor Couzens has achieved. Tom L. Johnson is dead and all but forgotten except in Cleveland, but out on Woodward Avenue in Detroit there is a statue of Hazen S. Pingree.

What a different story the closing chapters have been in the negotiations now concluded when they are compared with the attempt by Mr. Johnson and Mr. Pingree to bring about municipal ownership. The answer is found not in the fact that Mr. Johnson, who waged a bitter war later in Cleveland, was not the equal of Mayor Couzens, but that Mayor Couzens and the forces aligned on the side of municipal ownership in Detroit were aided and helped by circumstances that worked materially in their benefit. The record of these is found very largely in the weapon which the city was able to bring against the company on account of the expiring franchises. On every side after the final court decision, the Detroit United found itself confronted with threats of the remorseless use of the ouster. The company had become a trespasser on many streets through the expiration of its franchises. It was operating on sufferance under so-called day-to-day agreements. The Supreme Court decision in the famous Fort Street Case, pretty well sounded the fate of the company that even a change in ownership could not avert. More than a year ago Alexander Dow and others with a record of getting on well in Detroit and other cities where they own and control utilities made themselves factors in the councils of the company, but it was too late. Finally the Canadian interests in the company asserted themselves with the result that the negotiations were concluded upon which the sale has been accomplished to the city at the price of $19,850,000, with an initial payment of $2,770,000 and $500,000 semi-annually.

The Beginning of the End

The concluding stage of the agitation against the company was begun in 1918. "Jim" Couzens had recently accepted some $30,000,000 from Henry Ford for his interest in the Ford Company. With the great bulk of this sum invested securely in municipal bonds Mr. Couzens cast about for something to do. The bug of political office stung him. He was overcome with a desire to become a champion of the people. Well, there was the job of Mayor. Somebody had to fill that office. Why not "Jim" Couzens? So Mr. Couzens proclaimed himself a candidate. Now proclaiming yourself a candidate is one thing. Getting yourself elected is another. A politician with a burning desire for office would have proceeded by formula to attain the desired end. A mere citizen imbued with the same ambition had to pursue a different course. And "Jim" Couzens did it. At that time the Detroit United Railway was charging a 6-cent fare. James Couzens with his private auto close at hand boarded a Detroit United car. He tendered the conductor 5 cents. This the conductor refused to accept. Plain Mr. Couzens stepped off the car to the tune of clicking cameras while newspaper men made notes. "Jim" Couzens had accomplished his end. The conductor who refused the 5 cents remained a conductor, but a few months later Detroit recorded its gratitude to Mr. Couzens by electing him Mayor. The battle was then on in earnest.

But before this "Jim" Couzens had felt the political urge. He had previously been a member of the city street railway commission. Later Mayor Marx appointed him police commissioner to clean up Detroit. He cleaned it up, too. Once when a strike had seemed certain on the Detroit United Railway Mr. Couzens had threatened to turn on the streets of Detroit the entire production of the Ford factory to carry the people if the railway men went out. This was a terrible threat. Luckily for Detroit Mr. Couzens was not called upon to put the threat into execution. Once before when the railway had attempted to collect 6 cents and the crews had stalled the cars in the streets "Jim" Couzens as Police Commissioner arrested the crews.

"Jim" Couzens had promised the people municipal ownership if he was elected. As one of the early moves toward that end Mayor Couzens started the construction of a city-owned railway system in territory not served by the Detroit United. The record of the progress of that undertaking had been written from week to week in the ELECTRIC RAILWAY JOURNAL. Some of the outstanding technical features of that construction have also been described in these pages. As explained previously it is the organization that was built up to run these lines that will operate the combined lines now.

Municipal ownership might have come eventually even if Mr. Couzens had not been elected Mayor. Whether or not it would is something for the prophets to fight about. Mayor Couzens entered on the building of the municipal lines only after the voters had turned down the proposal of the Detroit United to sell for about $31,000,000. It must not be supposed, however, that the city is now getting for $20,000,000 all that it would have got under the $31,000,000 offer. Far from it. In the first place it is several years now since that offer. Meanwhile the property has deteriorated, for the company could hardly be expected to be lavish in expending money on a system that was confronted with such great uncertainty as to its future. Moreover, the company has retained for the use of its interurban lines certain valuable properties that were included in the original offer of $31,000,000.

Meanwhile, "Jim" Couzens came up for re-election. He won by 30,000 where before he had only a few thousand majority. Things began to happen at once. The battle of the Detroit United for the preservation of its rights had been fought through the courts. The Supreme Court had said that the franchises for the Woodward and other important lines had all expired. An offer was made by the city for the lines. It was considered by the company to be so low as to be ridiculous. The answer of the city was: Sell out or

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How the Department of Street Railways, Detroit, Is Organized

JAMES COUZENS, Mayor

G. O. Ellis, President Street Railway Commission
M. H. Esselstyn, Commissioner

W. B. Mayo, Commissioner
Ross Schram, Secretary

J. S. Goodwin	General Manager	M*
Ross Schram	Assistant General Manager	M
W. C. Markham	Construction Engineer	M
I. N. Merritt	Auditor	M
F. R. Meyer	Supervisor of Supplies	M
H. B. Selden	Claims Attorney	M
D. P. Stafford	Employment Interviewer	M
	TRANSPORTATION DEPARTMENT	
E. S. Rider	Superintendent of Transportation	M
L. S. Tackaberry	Chief Clerk	D.U.R.†
T. S. Rust	Assistant Chief Clerk	M
B. R. Bigelow	Supervisor of Personnel and Instruction	M
F. A. Vogel	Division Superintendent	M
D. A. Smith	Division Superintendent	D.U.R.
H. B. Kirchoff	Division Superintendent	D.U.R.
Albert Bath	Division Superintendent	D.U.R.
Richard Dawson	Division Superintendent	D.U.R.
Leo Reynolds	Division Superintendent	D.U.R.
C. J. Wendt	Division Superintendent	D.U.R.
	MECHANICAL DEPARTMENT	
A. C. Colby	Superintendent of Equipment	M
H. S. Williams	Assistant Superintendent of Equipment	M
F. M. Weld	Master Mechanic	M
G. P. Richardson	General Foreman	M
William Machleit	General City Inspector	D.U.R.
Frank Liddy	Superintendent Compressor Stations	D.U.R.
George Dunning	Foreman Electrical Department	D.U.R.
Ernest Kossow	Foreman Carpenter Shop	D.U.R.
Eugene Fournier	Foreman Pipe Fitter	D.U.R.
Alexander Morrison	Foreman Machine Shop	D.U.R.
Edward Rowe	Foreman Blacksmiths Shop	D.U.R.
Albert Roye	Foreman Truck Shop	D.U.R.
Chas. Borrowman	Foreman Sheet Metal Shop	D.U.R.
Harry Ferguson	Foreman Wiring Department	D.U.R.
James Older	Foreman Painter	D.U.R.
John Kalchthaler	Foreman East Jefferson Carhouse	D.U.R.
Fred Lampson	Foreman Woodward Carhouse	D.U.R.
Edwin C. Barnes	Foreman Michigan Carhouse	D.U.R.
John Bentley	Foreman Leesville Carhouse	D.U.R.
Ernest Hauk	Foreman Brush Carhouse	D.U.R.
Frank Clark	Foreman Trumbull Carhouse	M
Marshall J. Hadley	Foreman West Jefferson Carhouse	D.U.R.
Joseph Otenbaker	Foreman Harper Carhouse	D.U.R.
William Gordon	Foreman Warren Carhouse	D.U.R.
Fred Richards	Foreman Baker Carhouse	D.U.R.
Edward Reschke	Foreman Kercheval Carhouse	D.U.R.
Henry Brockert	Foreman St. Jean Carhouse	M
	TRACK DEPARTMENT	
W. D. Edgecomb	Engineer Maintenance of Way	M
P. A. Kerwin	Superintendent of Tracks	D.U.R.
H. Ingold	Office Assistant	D.U.R.
H. McKinstry	Chief Timekeeper	D.U.R.
J. D. Twomey	Yard Master	D.U.R
J. L. Fenton	Assistant Engineer	M
	ELECTRICAL DEPARTMENT	
H. M. Gould	Electrical Engineer	M
L. R. Wagner	Assistant Engineer	M
H. R. Stearns	Assistant Engineer	M
T. W. Butler	Assistant Engineer	D.U.R.
M. F. M. Werth	Consulting Engineer	D.U.R.
E. M. Booth	Superintendent of Lines	M
G. T. Rhodes	Superintendent of Welding and Bonding	M
R. E. Hunt	Chief Chemist	D.U.R.
H. S. Brown	Superintendent of Substations	D.U.R.
A. F. Allyn	Superintendent of Power Stations	D.U.R.

*M—Formerly with municipal railway.
†D.U.R.—Formerly with Detroit United Railway.

get out. In accordance with this ultimatum an ouster ordinance was passed, but it was never executed, for the negotiations were soon begun which have terminated in the present sale.

Here is the record of some of the principal moves made since 1918, arranged in chronological order:

In July, 1918, the Detroit Street Railway Commission reopened negotiations with the company for the purchase of its properties upon some agreeable basis.

On Feb. 12, 1919, the company declined the city's offer to purchase the lines within the 5-cent zone for $29,653,936.

The company shortly thereafter made a counter proposal that the city lease the properties at an annual rental of $2,000,000. This was rejected by the city officials and the Street Railway Commission.

On March 10, 1919, an agreement was reached between the company and the city officials for the sale of the company's properties to the city at a compromise price of $31,500,000. The voters rejected this proposal at the election on April 7 that year.

On April 4, 1920, an ordinance providing for service-at-cost was defeated. This plan provided for combining the city-owned lines and the private lines.

In February, 1921, the United States Supreme Court validated the municipal ownership ordinance and reaffirmed the right of the city to order the D. U. R. off streets where its franchises had expired.

Last fall the ouster ordinance was passed by the Council, but the forcing of the company from the streets where franchises had expired was delayed pending renewal of the purchase negotiations.

On Dec. 15, joint operation over certain of the company's lines and certain of the city's lines was begun.

On Dec. 22, 1921, 29½ miles of Detroit United lines were taken over by the city following arbitration in which the price for these lines was fixed at $2,297,700.

On April 17, 1922, the voters approved purchase of the company's lines for $19,850,000.

On May 15, the lines were taken over, in accordance with the general terms noted elsewhere in this account.

With respect to fares, these were changed from time to time under authority from the courts and in accordance with agreement with the city. The record of all these moves and counter moves forms a basis for a separate history the importance of which has now become mostly a significance of the hour.

This story, as a story, would not be complete without further reference to the attempt to arrange for service-at-cost grants in Detroit as a way out of the situation that developed there. Mayor Couzens flatly refused to commit the city to the service-at-cost plan. Despite this, however, Detroit just narrowly escaped an arrangement similar to the one which has proved so advantageous in Cleveland. The service-at-cost proposal for Detroit had a strong following, but Mayor Couzens proved obdurate. He refused to put the plan to referendum. The company, however, went right into the hall of the Common Council with its proposals. The Council inclined toward the plan, passed the necessary enabling resolutions and ordinances, but these the Mayor promptly vetoed. The Council then moved to pass the measure over the Mayor's veto. That body nearly succeeded in doing so. It was only the vote of a single Councilman that prevented this measure from going into effect.

The sale of the properties in the city to the city will leave the Detroit United Railway with 600 miles of interurban lines. Including real estate, cars, overhead equipment and valuable rights in Flint and Port Huron, the 600 miles will, if city payments totaling $19,850,000 are applied to reduce the "cost of property" account, stand on company's books at slightly less than $40,000,000.

Applying city payments to reduce the bonded debt total of $35,221,500 (Dec. 31, 1921) the remainder will be $15,371,500, or at rate of $25,618 per mile. An authority of the affairs of the company says that some idea of the effect of purchase may be had by assuming immediate effect of sale payments and changing the Dec. 31 statement accordingly. This would then show:

ASSETS	
Cost of properties (600 miles)	*$39,712,566
Sinking fund	64,962
Other investments	431,565
Inventories	1,621,201
Cash and accounts receivable	1,902,009
Deferred charges	438,915
	$44,171,218
LIABILITIES	
Bonded debt (600 miles)	†$15,371,500
Real estate mortgage	513,692
Reserves, etc.	1,848,082
Current liabilities	2,921,279
Capital outstanding	15,375,000
Surplus	8,141,665
	$44,171,218

*$59,562,000 less $19,850,000 city payment.
†$35,221,500 less $19,850,000 payment.

It is pointed out that additional factors in the city purchase contract are provisions that city pay 6 per cent on unpaid balances of purchase price and take over practically all the company's inventory of materials and supplies. Inasmuch as company's long term debt is largely financed at 4½ per cent it is estimated that the 6 per cent interest clause means an advantage of around $1,000,000. Sale of its inventory for city lines means half a million or more immediate income.

This balance sheet shows in a general way how the situation will stand in Detroit after the city lines of the Detroit United Railway have been taken over by the city. Like most other tabulations, however, the figures need some elaboration. They show clearly that fewer than 300 of the 900 miles of the company are located within the city of Detroit, but they give no idea of the extent of the rest of the system or of its value as a money maker. After all, it is the interurban properties of the company that really count. In addition to owning the city systems in Flint, Pontiac, Ann Arbor, Port Huron, and

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one or two other fairly important Michigan towns, there are interurban lines tying all of these places with Detroit. All of these lines are also in the so-called automobile belt. This means a great deal from the money-making standpoint to the Detroit United Railway. It is to these lines that the Detroit United management will now turn all of its attention. With the management freed from the trials and tribulations which have gone with the running of the local lines in the city of Detroit, it is only reasonable to expect that the development of the interurban lines will be carried on to an extent that will make of them even much greater earners in the future than they ever have been in the past. This is saying a great deal, for the interurban lines of the Detroit United Railway have in times past been exceedingly prosperous, though not showing up as well under present competitive and slack business conditions.

This, then, is the record of some of the outstanding events in the controversy between the company and the city and of the negotiations which have led up to the purchase by the city.

As for the future. The idea of Mayor Couzens is that in the street railway the officials in public office in the city will have direct contact with the people through the municipal railway 450,000,000 times a year. Every citizen has something at stake. It is his idea that it is inconceivable that such contact would permit political wasters or plunderers to work. He is on record as saying:

"Municipal ownership is bound to be a success. Anything that is founded on public service will succeed. Our other utilities—light and water—have been successes. There is no reason to believe that street railways should not succeed, too."

There can be no blinking at the fact that Mayor Couzens will set about making municipal operation a success with as much determination as he set about to accomplish municipal ownership. Just how much he and his successors in office will be able to accomplish is something that will be answered only by the lapse of time.

As a subject "Jim" Couzens has been done to death. He is a constant source of copy to the daily newspapers, not much less so than Henry Ford. While his name will, of course, always be coupled with the closing fight in Detroit over the railway matter, still "Jim" Couzens, to ELECTRIC RAILWAY JOURNAL readers, is of interest principally as the vehicle through which the main moves were made in Detroit. It may even seem to some that he has been given too prominent a place in this account. The answer is that you can't very well write about municipal ownership in Detroit without saying a great deal about "Jim" Couzens. It would of course have been possible practically to eliminate Mr. Couzens from the picture, but that would in no way alter the stern reality that Detroit has gone to municipal ownership.

Cleveland Men Accept Cut

Submit to Wage Reduction Rather Than Run Risk of Having Entire Agreement Reopened

Conductors and motormen of the Cleveland (Ohio) Railway have voted to accept a wage reduction of 10 per cent, rather than to submit to arbitration the terms of an entirely new working agreement. The old agreement expired on May 1.

FIVE-CENT PAY REDUCTION

The vote reduces the men's wages from a scale of 55 cents an hour for new men, 58 cents for men with more than six month's service, and 60 cents an hour for men in the company's employ more than a year, to one which provides 50, 53 and 55 cents an hour for the respective classes.

As a result of the vote to accept the new scale, company officials hope to be able to place a 5-cent rate of fare into effect in Cleveland before the end of the year.

Acceptance of the wage reduction was a direct reversal of the stand of the men in a referendum two weeks ago when they voted against a reduction and for arbitration. After they learned that arbitration would probably include the submission of the closed shop clause to the arbiters, the protest of the men caused the officers of the union to decide to offer a second referendum.

At this second referendum the men took the wage cut by vote of 1,186 to 790.

The change in sentiment, it was apparent, was due to the fact that the men preferred to take a cut to arbitration of the question of an open or closed shop and all the other advantages heretofore held under their agreement. Under such a situation their right to organize would have been submitted to outsiders and in the event of an adverse decision on the closed shop question the union would have been left weakened.

CLOSED SHOP AT PRESENT

The present closed shop agreement provides arbitration of all disputes, but the company insisted arbitration of the wage question must include arbitration on all points.

John J. Stanley, president of the company, said:

> This wage reduction should result in an increase of some $30,000 a month in the company's interest fund, which determines what rate of fare shall be charged. We are hopeful that this, together with other economies already in effect, will make possible a return to a 5-cent fare in Cleveland some time during this year.

The new wage scale is retroactive to May 1.

Good Will and Confidence Pledged Georgia Company

The Atlanta Federation of Labor recently pledged to President Arkwright and his company, namely the Georgia Railway & Power Company, its best wishes and friendly aid in any manner that would be useful in furthering the projects proposed by the company. "Two Bells" under date of April 25 reprints the resolutions signed by the legislative committee of the Federation. Some of the high points in the resolution are as follows:

> An impression seems to prevail in the public mind that there is an inherent hostility against the company by labor. This body is big and broad enough to differ specifically with the company and all employers, and agree with them and be helpful as to others. Organized labor never thrived on malice or hatred.
>
> The public should be given to understand that the Federation is fully able to judge when and where the activities of this body is necessary either for or against the company.
>
> We realize that in the contractural relations entered into by the Georgia Railway & Power Company with its organized employees they recognize the right of collective bargaining and the right of organized labor to a voice in the fixing of rates of pay, hours of labor and other conditions of employment. We believe this policy has been a great benefit to the growth and prosperity of Atlanta.
>
> Your committee feels that the Georgia Railway & Power Company possess the confidence and esteem of this body and the good will and encouragement in its undertakings.
>
> This does not imply that as an oganization and as citizens the body is called on to agree with the company in all its projects, but it does mean that we judge each proposition on its merits and by our own understanding, in no wise formed by passion or prejudice or outside influence and opinion.

Finishing Touches Being Put to Grand Rapids Franchise

After many months of negotiations between the city and the Grand Rapids (Mich.) Railway a settlement seems in sight. Speed is necessary, however, in completing the agreement between the company and the city if the proposed franchise is to be submitted to the electors at the primary on Sept. 12 as planned. The city has only recently submitted to the company its draft of the proposed franchise. It is acceptable to the company in almost all provisions, it is announced.

Meetings will be held in the near future to iron out minor details upon which there seems to be some objection by the company. A representative of the employees as well as the one from the company and city attend these meetings.

The franchise, as proposed, will permit the company to charge a 10-cent cash fare, with seven tickets for 50 cents, until January, 1923. At that time a readjustment is proposed. If any surplus is made after the date of the passage of the franchise and before Jan. 1, 1923, over the return on the investment allowed by the city it will be turned into a surplus account to help in fare reduction.

The company has been operating without a franchise for many months. Ever since the franchise expired negotiations have been going on between the company and the city. The changing conditions, however, made it impossible to arrive at a decision as to fares. There was also a long discussion over the valuation of the property and for many months there was a deadlock. This question was finally settled and the city started work drafting the proposed franchise.

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Wage Matters Not Finally Settled

Disputed points left over from the arbitration of the Springfield and the Worcester (Mass.) Consolidated Street Railway controversies over wages and working conditions have not yet been definitely settled. After supplemental hearings, James J. Storrow, the neutral arbitrator, advised that the Worcester contract be accepted as governing the various disputed points on both systems. When the men objected, on the ground that the Worcester contract had not been fully observed in practice, it was suggested that the established practice in Worcester be followed there and in Springfield, whereupon a dispute arose over what has actually constituted such practise. For the present the question is in abeyance, pending the company's formulation of a summer program, following which the men propose to give close scrutiny to the manner in which the company applies the rules supposed to follow Worcester procedure. However, the company has agreed to a request that more of the spare men be placed on regular runs, and also to the payment of time and half for overtime of the spare men working under certain conditions.

Proposes Unification of Railway Lines

Representative Richards recently introduced a bill for the consideration of the Massachusetts Legislature which will unify the electric railway lines in the metropolitan Boston district under the control of a Metropolitan Transit Commission. The proposed unification would bring under lease to the Boston Elevated the Hyde Park and West Roxbury divisions and also the Chelsea division of the Eastern Massachusetts Street Railway. The plan is advanced to work out the transportation problem of the Hyde Park and Revere Beach sections, which have confronted the trustees of the Elevated and the Eastern Massachusetts Street Railway for some time. Representative Richards has announced that there would be a single fare within the metropolitan transit district.

Mayor Curley is opposed to the bill, as, also, are the trustees of the Eastern Massachusetts Street Railway. The trustees claim the terms of the bill would dismember the properties of the company and would result in unfairness to riders and stockholders. Under the proposed bill the stockholders would have no voice in the matter.

Strike Ties Up Line

The lines of the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, are tied up by a strike of the trainmen. The company was prepared to resume service, but the first attempt to do so in East Liverpool resulted in a demonstration so hostile to the company that the effort to operate was discontinued at the request of Mayor Wilson. Workers imported from Cleveland and Toledo to replace the strikers were set upon by rioters and beaten up. The controversy appears to have arisen over the refusal of the company to deal with any but its own employees as individuals, but efforts made by the ELECTRIC RAILWAY JOURNAL to secure a statement for publication from official sources have proved unavailing. The contract between the company and its men expired on May 1.

Film Shows Commission's Relief Plan

Movie fans who flocked to the New York City Town Hall on Friday night, May 5, didn't see William S. Hart engage in any Wild West duel nor Douglas Fairbanks jump from one roof to another but saw a "reel" feat—Mr. S. Trapp Hanger traveling on the Interborough Transit Company during morning rush hours in an effort to reach his office. He was jarred, jostled and jammed so in the shuttle train operating between the east and west side of the city Forty-second Street that he beseeched Father Knickerbocker to come to the rescue. "Standing Room Only," the commission's motion picture, portrayed New York City's past, present and future transportation problems and developments. The solution to the present transportation problem was shown to be in the commission's plan which stood for New Construction, Consolidation, Reorganization, Honest Values and Public Ownership.

An informal debate was part of the program at the Town Hall, the participants being Murray Hulbert, president of the Board of Aldermen, Major-General O'Ryan, one of the commissioners, and Daniel L. Turner, chief engineer of the commission.

Mayor Addresses Railway Men

In a brief address before 300 officials and employees of the Connecticut Company at Hartford, on May 11, Mayor Richard J. Kinsella, said that he intended to confer in the near future with Lucius S. Storrs, president of the Connecticut Company, with respect to the local railway situation. Mr. Kinsella was elected on a platform calling for lower fares.

Nathaniel J. Scott reviewed his first year as manager of the Hartford division of the Connecticut Company.

Ralph Martin, traffic manager for the company, gave some interesting figures and data on the traffic checking system.

F. P. McKaig and H. Jackson Tippett, officials in the track and pavement construction department, outlined the work of this department.

Leslie Spraggon of the mechanical department stressed the need of shop efficiency.

Mr. Storrs said: "We must pull together to sell service to the public."

Joseph Berry, special counsel for the company, created great hilarity by a humorous recital of a typical busy day of J. K. Punderford, vice-president and general manager of the company.

News Notes

New Contract Made.—The Empire State Railroad Corporation, Syracuse, N. Y., has completed a new contract with its interurban men, shopmen, etc., which calls for a reduction varying from 2 cents an hour for trainmen to 5 per cent in various other departments. With the exception of wage rates and certain changes in overtime provisions, the new contract is the same as that for last year.

Mayor Opposed to Transit Plans.—Mayor Hylan of New York City has expressed his opposition to the plan of the Transit Commission to construct seven subways at a cost of $218,000,000. He announced that the city would soon make public a plan of its own for new construction. The Mayor is very much against private operation and said that the city would appropriate money for new subway lines only on the basis of city ownership and city operation.

Denies Electrification Reports.—Reports from the East that the Great Northern Railway is preparing for electrification of part of its Western lines were denied recently by President Ralph Budd. The Great Northern has been studying electrification for several years and officials have in mind, it is understood, the starting of electric trains through the Rocky Mountain district as the next major development. President Budd said that the Great Northern has no plans for electrification in the immediate future.

Lease Approved.—The Public Service Commission has approved the lease for the operation of the Frankford "L" by the Philadelphia (Pa.) Rapid Transit Company. This decision brings to an end negotiations which have been under way for a period of five years. The commission has reserved for itself the right to determine a reasonable rate of fare to be charged patrons of the line and also the character of the service. W. D. B. Ainey, chairman of the commission, announced that the fare question would be considered ultimately upon the basis of the pending valuation proceedings.

New Franchise in Galesburg.—A new railway franchise at Galesburg, Ill., between the city and the Galesburg Railway, Lighting & Power Company, was passed and accepted under date of March 14, 1922. It runs for twenty years, which is the limit in the State of Illinois. The grant provides for the operation of one-man cars. Service is not to be less than twenty minutes on any line and the company is not to be held for any paving which the city may do, excepting that its tracks when laid will be laid on a base to conform with base used by the city when street is paved. No compensation is to be paid the city other than regular taxes.

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Financial and Corporate

Holders Urged to Accept

Protective Committee Sees This as Only Safe Way Out of Interborough Tangle

The protective committee representing the holders of the 4½ per cent collateral trust bonds of the Interborough-Metropolitan Company, New York, N. Y., has addressed a communication to holders of the bonds and of certificates of deposit, and also to holders of Interborough Rapid Transit Company stock urging upon them the conclusion that the best chance—perhaps the only chance—of saving the equity represented by Interborough stock, constituting principal security of Interborough-Metropolitan bonds, is the adoption of proposed Interborough-Manhattan plan of voluntary readjustment.

In pointing out that the plan effects a reduction of Manhattan dividend rental, reduces fixed charges on Interborough-Manhattan properties, accomplishes an extension or renewal of Interborough Rapid Transit 8 per cent gold notes aggregating $38,144,000, maturing Sept. 1, next, and provides for capital requirements of approximately $15,000,000, the committee states that unless some such plan is consummated, receivership is inevitable. Security holders are told that by fiscal year commencing July 1, 1925, earnings are estimated by officers of Interborough company to be at least sufficient to provide 4 per cent on Interborough stock. In addition, attention is called to the distinct value possessed by Interborough stock as a result of so-called "terminal payments" to which it will be entitled after retirement of first and refunding mortgage bonds. Following retirement, provided for through a sinking fund, entire earnings of city-owned subway system will accrue to system for eleven years intervening before expiration of operating contract with the city. Company preferential payments during this period would amount to $122,485,000, in addition to payments of $31,000,000 by the city for Interborough equipment.

The plan gives to holders of Interborough-Metropolitan 4½ per cent bonds and Interborough Rapid Transit Company stock the option.

(a) of purchasing, at their principal amount and accrued interest, new Interborough ten-year 6 per cent gold notes to the extent of 16 per cent of the principal amount of their bonds, or 32 per cent of the par value of their Interborough stock, respectively, and keeping all their bonds or stock, as the case may be; or

(b) of surrendering 60 per cent of their bonds or stock to an underwriting syndicate which has been formed to purchase such of the new notes as are not taken by said bondholders and stockholders (the notes purchased by said bondholders and stockholders and the surrendered bonds and stock, however, to be offered for subscription by holders of preferred and common stock of Interborough Consolidated Corporation).

The committee advises bondholders and stockholders to subscribe for their pro rata share of the new notes, thereby avoiding any sacrifice of their interest in the Interborough stock.

Since the preparation of the plan G. M. P. Murphy & Company, J. & W. Seligman & Company, Kidder, Peabody & Company and Guaranty Company, New York, as syndicate managers, have formed a syndicate which, for a cash commission to be paid by the Interborough Company, will underwrite the purchase as above provided.

The trust agreement under which Interborough stock is pledged to secure Interborough-Metropolitan 4½ per cent bonds is to be foreclosed and bondholders not assenting to the plan will receive only their pro rata share of the cash proceeds of such sale and of the sale of other unmortgaged assets of the Interborough Consolidated Corporation.

Will Contract for Safety Cars

Justice George E. Pierce in the Supreme Court at Buffalo has signed an order directing George Bullock, as receiver for the Buffalo & Lake Erie Traction Company, the Erie Electric Motor Company, the Erie City Passenger Railway, the Erie, Reed Park & Lake Side Street Railway and the Buffalo & Lackawanna Traction Company, to contract with the J. G. Brill Company, Philadelphia, for leasing on car trust agreements twenty-five one-man safety cars for operation by the Erie & Suburban Railway in the city of Erie, Pa. Mr. Bullock also controls this line by reason that all its capital stock is held by him as receiver for the other affiliated traction interests.

The agreement for the leasing of the cars and payment provides that the cars are to be single-truck, double-end, equipped with Birney safety motor car bodies complete with G.E. 264-A motor equipment, K-63 double-end control, G.E. air brakes, C.P.-25 compressors and Brill patented No. 79 E-I trucks.

The base rental to be paid is $159,492, at the rate of $6,379 per car, payable as follows; 25 per cent cash on shipment, the balance sight draft attached to bill of lading. The balance to be paid in sixty notes or lease warrants of the railway maturing monthly over a period of sixty months, with 6 per cent interest. The company must keep the property insured and the title vests in the Brill Company until payments have been completed.

$12,500,000 Issue Offered

Holding Company to Use Proceeds of Long-Term Issue to Retire Short-Term Paper

A contract has just been made by the Commonwealth Power, Railway & Light Company, New York, N. Y., which contemplates the sale of an issue of $12,500,000 twenty-five-year 6 per cent secured sinking fund gold bonds, the proceeds of which will be applied to the payment of banking indebtedness due Nov. 1, 1922, and convertible bonds due May 1, 1923. This provides for all indebtedness of the company except the serial notes maturing May 1, 1923-1924, and June 1, 1923-1924, amounting to $1,696,000, and other items aggregating $454,609, and outstanding scrip issued in lieu of cash dividends, maturing on Feb. 1, 1924, 1925, 1926 and 1927, amounting to $3,490,465.

In arranging this financing it was found desirable to group into one company the ownership of all the controlled companies engaged in the electric light, power and gas business, and to this end the Commonwealth Power Corporation has been organized to acquire the common stock of the Consumers Power Company, Central Illinois Light Company, Illinois Power Company, Southern Indiana Gas & Electric Company and the Springfield Light, Heat & Power Company, together with $5,318,500 of the preferred stocks of some of these companies, all of which stocks have been pledged as collateral to the $12,500,000 twenty-five-year bonds to be sold. All of the preferred and the common stock of Commonwealth Power Corporation come into the treasury of the Commonwealth Power, Railway & Light Company, either directly or through its subsidiary the Union Railway, Gas & Electric Company; so that the equity ownership of the Commonwealth Power, Railway & Light Company remains unimpaired.

George E. Hardy, president of the company, says that within a short time it is planned to submit to the stockholders of the company a plan for the conversion of their preferred stock and scrip into preferred stock of the Commonwealth Power Corporation. The details of this plan are now being considered, but it is understood that it will carry assurance that payment of dividends upon the preferred stock of the new company can be started.

As the plan now under contemplation provides for the retirement of a large amount of short-term indebtedness by the issuance of long-term obligations, it is expected that the value of the investment of the company in its subsidiaries will be materially improved. This, of course, should inure to the benefit of both the preferred and the common stocks of the Commonwealth Power, Railway & Light Company, so it is explained.

The new issue of $12,500,000 of Commonwealth Power Corporation 6 per cent bonds is being offered for subscription at 90 and interest to yield more than 6.80 per cent.

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Details Being Arranged

Securities Deposited in Furtherance of Reorganization Agreement for American Cities Company

There have been thus far deposited with the National Power & Light Company, $555,900 of the securities of the American Cities Company for which new securities are to be issued by the holding company. The securities being deposited are the 5-6 per cent bonds of the American Cities Company.

Meanwhile the National Power & Light Company plans to apply to the New Orleans Stock Exchange to list $8,655,000 of its securities, which are to be exchanged for the 5-6 per cent bonds of the American Cities Company.

The Interstate Trust & Banking Company, New Orleans, has been named agent for the Central Union Trust Company, New York, trustee of the mortgage covering the new securities of the National Power & Light Company and the Hibernia Bank & Trust Company, New Orleans, has been made transfer agent for the preferred and common stock with the Canal-Commercial Trust & Savings Bank, New Orleans, as registrar.

J. K. Newman, chairman of the committee of five, representing the holders of the 5-6 per cent collateral trust bonds of the American Cities Company, under the bondholders' deposit agreement of Jan. 15, 1919, has issued a statement of date of May 1, 1922, to the depositors of the American Cities Company of the above securities, explaining the plan of the bondholders' committee for the reorganization of the American Cities Company and giving a brief statement of the new company and its subsidiaries, the Memphis Gas & Electric Company, the Memphis Street Railway, the Birmingham Railway & Light Company, the Little Rock Railway & Electric Company, the Knoxville Railway & Light Company and the Houston Railway & Light Company. The statement is issued from the office of Isidore Newman & Sons, 212 Carondelet Street, New Orleans.

C. C. Chappelle, representing the Chase National Bank, New York, reached New Orleans May 10 and was a visitor at the City Hall, where he conferred with Commissioner of Public Utilities Paul Maloney on matters affecting the reorganization of the New Orleans Railway & Light Company. It is more than likely that until this matter has been definitely settled Mr. Chappelle will be a frequent visitor to New Orleans.

Seeks to Finance Construction of Ferryboats

Plans for financing the construction of two steel hull electrically driven ferryboats of 3,000-passenger capacity were submitted recently to the Railroad Commission by the San Francisco-Oakland Terminal Railways. The company asks permission to appropriate $300,000 from its depreciation fund and to issue $600,000 face value of 7 per cent serial equipment trust notes to be secured by a pledge of the boats. Permission is further requested to set aside $5,000 a month out of the depreciation fund for a sinking redemption fund for the equipment trust notes. The company agrees that when the reorganization plan now under way is perfected it will reimburse the depreciation fund from the sale of first mortgage bonds. The new ferryboats are to take the place of the steamer *San Jose*, destroyed by fire on March 23, 1919, and one of the boats now in service. The business is declared to be rapidly increasing and the employment of additional ferryboats of larger carrying capacity is said to be necessary.

Petitions for Abandonment

Sault Ste. Marie, Mich., a city of 15,000 inhabitants at the site of the famous "Soo Canal," St. Mary's River, connecting Lake Superior and Lake Huron, is experiencing street railway difficulties that have found their way before the Public Utilities Commission.

Since the advent of the gasoline motor vehicle, electric railway lines at Sault Ste. Marie, one a three-mile single track system from the country club, on the east side of the city, to the suburb of Algonquin, on the west side, and a loop about the city, have steadily lost money. The climax came when the city commission called on the Sault Ste. Marie Traction Company to pay approximately $8,000 for paving between and on either side of the tracks, on the "loop system," where streets have been dug for laying a trunk sewer.

This, the company explained, it was unable to do, and cited losses of $16,000 since Jan. 1, 1921. The city was insistent, however, and the company carried to the state utilities body a petition for authority to cease operations. The state commission heard the plea, then issued an order that "unless the city charter is amended so as to permit the company to escape its share of paving costs, the company will cease operations on July 15."

The city attorney has ruled that a special election to decide such a question is not permissible, but that a special election to vote on the "daylight saving plan" may be called, and the charter amendment made a separate issue of the same election. This will probably be done.

There is an element of the population at Sault Ste. Marie which believes the day of the electric street railway in cities of less than 50,000, has passed and that a flexible motor bus service is the only solution. They are divided, however, on the question of public or private ownership of such system, and these questions will probably enter largely into the election.

The company announces that it will cease operations July 15, unless the electorate votes to amend the charter and themselves assume the burden of paving.

Tax Exemption Vote Soon

Believed That New Measure Will Come Up Soon in House of Representatives for Consideration

Despite efforts to delay the consideration of tax-exempt security legislation, the joint resolution recently approved by the ways and means committee will be brought to a vote in the House of Representatives in the near future. It is believed that the resolution will pass, but a hard fight is in prospect.

The principal arguments being advanced against the legislation are that it will make it much more difficult for states and cities to sell their securities and that it will increase the rate of interest that farmers will have to pay for loans.

Some members of the House who oppose the resolution go so far as to say that a constitutional amendment such as is proposed will reduce materially state participation in such matters as federal aid highways and practically will preclude municipal operation of public utilities.

On the other hand, those favoring the legislation contend that the issuance of tax-exempt securities establishes a privileged class which enjoys all the benefits of public expenditures but which pays no share of them.

At the close of 1921 there were at least $15,000,000,000 of tax-exempt securities in existence. In 1921 alone the amount was increased by more than $1,000,000,000. While the rate of increase in 1922 may not be as great as in recent years, it is declared to be obvious that these securities will be issued in constantly increasing quantities.

ADVOCATES CLAIM PRIVATELY-OWNED UTILITIES SUFFER MOST

While industry as a whole suffers because it is denied the use of large sums which can be invested more profitably in tax-free securities, the privately owned public utilities suffer most, friends of the resolution point out, because they cannot compete with publicly owned undertakings whose bonds are tax exempt.

A majority of the committee on ways and means voted to recommend the legislation and gave eight reasons why the issuance of tax-exempt securities should be condemned. As the committee sees it tax exemption does all of the following things:

1. Causes a great loss of revenue by permitting a large portion of property to escape taxation.
2. Violates the ability principle of taxation and discriminates unfairly between taxpayers.
3. Impedes private financing.
4. Discourages investment in new enterprises.
5. Encourages extravagances of governmental agencies.
6. Grants a private subsidy to certain interests.
7. Increases the rate of interest required for all enterprises not carried on by the government and thereby adds to the cost of living, because under it money is withdrawn from private enterprise.
8. Creates social unrest.

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Another Offer Made to Become Company Stockholders

All employees of the Public Service Railway, Newark, N. J., who want to take advantage of another opportunity to get in on the "customer-ownership" plan can make application to their respective department heads. "All Together," the official publication of the railway at Camden, says that the Public Service Corporation, which operates the railway, gas and electric properties, has gained so many thousand customers as partners through the plan that it is making a brand new offer to help employees to become part owners on an easy payment plan. No initial payment on the stock will be required and a flat amount of only 75 cents per share a week or $3 per share a month will be deducted from the pay envelopes so that the stock will be paid for in two and one-half years. Eight per cent interest will be allowed on payments and the interest will be compounded quarterly.

Consolidation of Utilities at Columbus

Comprehensive plans for the consolidation of electric railway and gas utilities at Columbus, Ga., under the management of Stone & Webster, Inc., have been approved by stockholders of the Columbus Railroad, and if sanctioned by the Railroad Commission of Georgia will be put into effect in the near future. The Columbus Electric Company owns all the common stock of the Columbus Power Company, Columbus Railroad and of the Gas Light Company of Columbus. Recent legislation in Georgia has given to the railroad company, long engaged in the electric railway and retail electric light and power businesses, the right also to generate and furnish gas to consumers. It has long been apparent that it would be desirable to consolidate the subsidiary companies of the Columbus Electric Company in order that a flexible financial structure might be set up adequately to care for the expected growth of business, and such as to give the stockholders of the Columbus Electric Company direct ownership in the physical properties. The laws of the State confer the right to consolidate the power and the railroad companies, the market is regarded as favorable for long-term or permanent financing, and the time is looked upon as advantageous for financing $1,750,000 of 6 per cent coupon notes of the electric company, due July 1, 1922.

The plan contemplates the changing of the name of the Columbus Railroad to the Columbus Electric & Power Company and

(a) Acquisition by the new company of the properties of the Columbus Power Company, subject to $3,667,000 outstanding first mortgage bonds due in 1936, and assuming payment thereof.

(b) Acquisition by the new company of the properties of the Gas Light Company of Columbus.

(c) Issuing by the new company of first mortgage bonds and 7 per cent cumulative first preferred stock to cover the indebtedness of the Columbus Electric Company, including the 1,750,000 coupon notes maturing July 1, 1922; $758,000 collateral trust 5s to be called at 105 (requiring $795,900), floating indebtedness of $240,000, and $50,000 consolidation expenses estimated. Provision may be made, if found feasible by the directors of the new company, for converting the above preferred stock at the option of the holders into common stock.

(d) Issuing the new company's 7 per cent cumulative second preferred stock to be exchanged share for share for the outstanding 6 per cent cumulative preferred stock of the Columbus Electric Company and $228,700 of 6 per cent preferred stock of the Columbus Power Company, this being all of the latter's preferred stock not held by the Columbus Electric Company.

(e) Providing for an issuance aggregating $1,500,000 of common stock by the new company, to be distributed share for share for the present common stock of the Columbus Electric Company.

All notes and open accounts held by the Columbus Electric Company against its subsidiaries will be canceled.

The initial capitalization of the Columbus Electric & Power Company will total $10,095,700, of which $5,167,000 will be in bonds and the balance in stock. A considerable amount of duplication of corporate administration will be eliminated by the consolidation. Gross earnings of the combined properties for the twelve months ended Jan. 31 were $1,824,787.

Financial News Notes

Annual Meetings Held.—Annual meetings of the officers, directors and stockholders of the Michigan Railway and the Michigan United Railways were held recently at the general offices of the railway lines in Jackson. The old officers and directors of each company were re-elected.

Nine Months Income $116,043.—For the nine months ended March 31, 1922, the report of the New York Railways shows a net income of $116,043, compared with a deficit for the corresponding period a year ago of $380,360. Though the operating revenue was some $52,000 less than in the nine months ended March, 1921, the operating expenses decreased from $6,824,930 to $6,214,134 for the nine months ended March of this year.

Under Control of New Interests.—Day & Zimmermann, Inc., recently announced that through the purchase from Brown Brothers & Company of the controlling interest in the common stock of the York (Pa.) Railways the affairs and operation of the company will be brought under their supervision. No financing is contemplated at present. It is said that the deal involved 27,000 shares of stock held previously by Brown Brothers & Company.

Lake Shore Property Reports.—The Lake Shore Electric Railway, Cleveland, Ohio, reports gross earnings for 1921 of $2,080,980, against $2,699,342 for 1920. Operating expenses and taxes decreased from $2,037,417 in 1920 to $1,682,184 in 1921. The net surplus, however, fell considerably below that of 1920, the 1920 figure being $327,035 and the 1921 surplus being only $65,400. The number of passengers carried decreased from 7,687,946 in 1920 to 6,802,291 in 1921.

Wants to Issue Securities.—To finance needed improvements and extensions of its lines in Gary, Ind., the Gary Street Railway has filed a petition with the Indiana Public Service Commission asking for authority to issue additional securities. The company plans to issue a total of $130,000 of twenty-year 5 per cent first mortgage gold bonds. It is believed the improvements will cost not to exceed $103,000, but the larger bond issue is asked to care for the expense of selling the bonds at a discount which will make them yield 7 per cent to the purchasers.

Four Months Report Made.—For the four months ended April 30, 1922, the Philadelphia (Pa.) Rapid Transit Company reports a net income of $806,343, against $540,110 for the same period in 1921. The total passenger revenue for the period from January to April, 1922, inclusive, amounted to $13,486,680, a decrease of $431,508 over the same period in 1921. The total number of passengers showed a decrease of more than 6,000,000. In the 1921 period the number of passengers carried was 279,758,158, compared with 273,717,648 for the same period this year.

Purchase Announced.—Purchase of the city lighting and power plant of the Ohio Electric Railway, in Lima, Ohio, by the American Gas & Electric Company for a consideration said to be $1,000,000 was announced in Lima, on May 10, by the receiver of the Ohio Electric Railway, B. J. Jones. The deal was engineered by Drexel & Company, Philadelphia, acting for the bondholders. Reports are current in Lima that the American Gas & Electric Company also contemplates the purchase of the Lima city street car lines, which are at present operated by the Ohio Electric Company. The Lima plant has been supplying power for the city lines in Lima as well as furnishing city consumers with electricity for light and power.

Would Have Commission Value Line.—Contending that an appraisement by the owners of $26,500 is exorbitant, the Commission Council of Green Bay, Wis., has petitioned the Wisconsin Railroad Commission to have commission figures placed on the Bay Beach extension electric railway line. Two miles of track, an indeterminate franchise and some equipment comprise the total of the line's holdings. The city operates an amusement resort at the beach end of the line and last year leased from the owners and bought power. One mile of trackage is within the city limits and the Council contemplates devising some plan whereby the city can buy outright and either operate the line as a municipal project or release it to the Wisconsin Public Service Company. The line is owned by A. W. Priest, Appleton, Wis.

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Traffic and Transportation

City Action Held Invalid

Shreveport Railways Compelled to Return to Five-Cent Fare on Legal Technicality

The Shreveport (La.) Railways has returned to a 5-cent fare. This is the result of a decision in the case of Long vs. the city of Shreveport in which a rehearing was denied from the ruling of the State Supreme Court, holding that the 6-cent fare measure had not been legally enacted. There was no denial by the court, however, of the right of the city to authorize an increase and readoption under a readvertisement. This the Council is proceeding to do.

It appears that back in 1920 the City Commission adopted an ordinance granting the Shreveport Railways the right to charge a 6-cent fare. The matter was presented to the public for a vote and the increase was passed upon favorably by the citizens. Having failed in his efforts to defeat the proposition at the election Mr. Long filed suit to annul the election, alleging that the proceedings of the Mayor and Council in calling the vote were not in accordance with the procedure prescribed for such action.

The District Judge sustained Mr. Long's contention. The railway appealed the case, agreeing to give rebate slips good for the extra cent in the event that the case finally went against it. This it has since been doing.

In the case of Long against the Shreveport Railways the court on final decree reversed the judgment of the lower court. That ruling was in favor of the plaintiff in so far as it annulled the election by the people, holding the election valid and all steps leading up to the election legal and binding, but the court did decree that the subsequent action of the Council in putting on passage the final ordinance carrying the election into effect was irregular for want of technical compliance with the charter of the city giving to Council the right to put the ordinance on passage to carry the will of the people into effect. The decree reads as follows:

> For the reasons assigned, it is ordered adjudged and decreed that the judgment appealed from be annulled and set aside in so far as it annuls said election, which is hereby decreed to be valid. In all other respects said judgment is affirmed save and except that the Mayor and City Council of Shreveport be permitted, if they see proper, to give said required notice and to proceed on the authority granted in said election as if they had not as yet finally passed said ordinance. It is further ordered that the appellee pay the costs of this appeal.

The rehearing upon this decree was refused on April 24. The Council is now proceeding to put the ordinance on final passage.

The Attorney General of the State of Louisiana has since filed with the District Court of Shreveport a petition asking that the Mayor and the Commission Council be restrained from adopting the ordinance putting into effect the 6-cent fare, claiming that the State Public Service Commission has jurisdiction over the question. The District Judge has heard arguments on both sides of the question and has taken the matter under advisement.

The question to be decided is whether the city of Shreveport had legal authority to grant franchises and exercise supervision and control over its public utilities prior to the adoption of the new constitution on July 1, 1921.

It is contended by the State's Attorney that without expressed specific authority granted by the State Legislature the city was without authority. That official says he can find no such authority granted to the city of Shreveport.

One-Man Cars Approved for Meriden

"It is the judgment of the commission that the one-man Birney safety car affords a higher degree of safety than the present heavier two-man car, which is unequipped with similar automatic safety device," says a decision of the Public Utilities Commission of Connecticut in denying a protest by city officials of Meriden against the contemplated use by the Connecticut Company of one-man cars on the Colony Street and East Main Street lines of the company in that city.

Mayor H. T. King protested that it would be dangerous to permit the use of the cars due to the fact that on East Main Street there is a long steep hill just a short distance from a grade crossing on the main line of the "New Haven" road.

The company claimed that one-man cars would be safer than the present two-man cars as the Birney cars are equipped with the latest safety devices. In addition the cost of operation would be materially lessened. During 1921 there was a loss of about $40,000 in Meriden and the receipts of the division thus far in 1922 have been running about 17 per cent less than in 1921.

The commission said that it was difficult to perceive of what particular usefulness an extra man would be on a car of which the motorman had lost control and that the safety devices with which the cars are equipped afford passengers every protection that human ingenuity could devise. With reference to the element of danger at the crossings of the steam railroad the commission pointed out that crossings are protected by gatemen who are present for twenty-four hours each day and that as a precaution against a car becoming stalled when on the railroad tracks, the company has provided at these crossings an electrified net with which the trolley pole would come in contact.

Increased Fares Authorized—Economies Being Effected

Permission to increase fares in the city of Springfield, Ohio, from 5 to 7 cents, with stops at every other street intersection within the corporate limits, has been granted to the Springfield & Washington Railway, South Charleston, Ohio, by the City Commission. The action was taken by the commission on application of the company which was recently reorganized. The company's application was given the support of the Springfield Chamber of Commerce and City Manager Edgar E. Parsons. Previously, the company's franchise had called for a 5-cent fare with stops at all street intersections.

The application is in line with the plans of the new owner of the traction line to place it on a paying basis. Prior to the reorganization, application had been filed with the State Utilities Commission for authority to abandon service. The company, however, was purchased by George D. Baker of Washington Courthouse, who withdrew the application to abandon and announced his intention of attempting to make the project pay.

Another move toward economy was the removal of the station from the center of the city, where the rental was more or less excessive, to a cheaper location. Bus routes were also established to serve as "feeders" and an agreement was reached with the Flag bus line of Washington Courthouse, whereby bus service to Springfield was discontinued. Under the agreement the buses now operate to South Charleston, where passengers for Springfield are transferred to the traction line.

Eight-Cent Fare Extended

The Public Service Commission of Missouri has issued an order extending for six months from May 18, the 8-cent fare charge by the Kansas City Railways. The company had displayed to the commission its earnings and estimated earnings, which showed about a million and a half excess over operating expenses but a deficit considering fixed charges, of about $293,000. The city representatives consented to an extension of six months for the 8-cent fare, but objected to a longer extension because of the possibility that costs of coal and operating expenses might decline by the time that the extension for six months had expired.

The commission approved advertising as a legitimate expense of utility operation, and explicitly instructed the company to use publicity methods for exploiting the sale of tickets and tokens at rates lower than 8 cents—tokens at two for 15 cents on cars, and tickets at five for 35 cents at many local points, where also books of 25 tickets are sold for $1.75.

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More Fare Modifications

Connecticut Experiments to Continue—Commission Recommends Use of Buses

"The commission does not at this time deem it good public policy or warranted by the facts presented to make any general change in the rates outside of the test areas, but will retain jurisdiction over all pending cases for future determination." This is a statement contained in a letter sent on May 11 by the Connecticut Public Utilities Commission to president Lucius S. Storrs of the Connecticut Company.

"We feel, however," the letter states, "that a continuation of the tests with some modifications in both Norwalk and Bridgeport is justified and desirable in view of the results already shown."

The commission points out that petitions affecting rates are pending from Norwalk, Bridgeport, New Haven, Waterbury, New Britain and Hartford. In Norwalk and Bridgeport the present rates were put in under temporary order of the commission directing test periods subject to change as the commission may deem advisable.

Suggestion is made by way of further experiment in Norwalk until July 1 that 5-cent fares without transfer be established on all lines in that city. Weekly reports on this scheme are desired by the commission.

The commission also suggests installation of buses on lines not now paying which would cut the costs of operation.

The commission said in part:

The year 1920 resulted in an operating deficit for your company of $1,400,000, while the year 1921, which was the first period the 10-cent fare was in effect throughout an entire year, showed an income, after payment of operating expenses and of current taxes, but before payment of any return on the value of the property, of substantially $750,000. It is estimated that if the present rates of fare remain in effect, the income for 1922 after payment of operating costs but before payment of current taxes or any return on the value of the property, will be about $1,300,000.

The higher rates instituted by authority of the commission have resulted in increasing the company's revenue, but not sufficiently to allow a fair return on the value of the property as determined by the commission. It would be unfortunate so to readjust or reduce the rates of fare at this time as to put the company back in its previous condition, and at this writing conditions do not justify any extended experiment with rates of fare in new territory, especially as the State is now deriving benefit by reason of the payment of back taxes.

The commission does not at this time deem it good public policy or warranted by the facts presented, to make any general change in the rates outside of the test areas, but will retain jurisdiction over all pending cases for future determination. We feel, however, that a continuation of the tests, with some modifications in both Norwalk and Bridgeport, is justified and desirable in view of results already shown.

Norwalk, for a long term of years, has not been a paying division. In November, 1921, by order of the commission, there was established as an experiment or test, a short 5-cent zone on West Avenue, the result of which has shown a financial improvement over previous operations. All the lines in Norwalk are short and readily lend themselves to a short 5-cent zone system, although it is probable that the Dorland's Point line can never be successfully operated as a street railway line. The establishment of a 5-cent zone system, without transfer in Norwalk, would undoubtedly increase the riding and afford acceptable service to the great majority of the traveling public, although for a limited number going through more than two zones the rates would be increased. It is impossible, however, to make any equitable modification without creating a possible hardship upon a few, but the greatest good to the greatest number to a certain extent must have its influence.

The commission suggests by way of further experiment in Norwalk until July 1, 1922, and until further direction by the commission, that 5-cent fares, without transfer, be established on each of the lines in Norwalk.

If this suggestion is adopted by your company, the commission would desire weekly reports of the revenue received on each line, and as far as practicable a statement of revenues on the same lines during the preceding test period, and the period of last year, corresponding to the period of this experiment. The results shown by such an experiment should be of value in determining the advisibility of establishing shorter 5-cent zones on other lines of your system where it would be practicable.

At the hearing in Bridgeport in March, the Mayor of that city suggested that the present rates of fare be continued, but modified, to allow the present 10-cent fare riders the option of using tokens now enjoyed by the 10-cent fare riders throughout other parts of the State. The commission is of opinion that this is a reasonable suggestion and would recommend its adoption until July 1 and until further modification of the test rate. As in the case of Norwalk, the commission would desire your company to continue the submission of weekly reports.

As you are aware, there are certain lines on your system which are not now paying and never have paid expenses. The installation of buses on such lines would lessen the cost of operation and permit an extension of service to sections not now being served, and possibly produce additional revenue.

The commission would appreciae an acknowledgment of this communication with a statement of the company's attitude with reference thereto, particularly as to the adoption of the suggestions made herein.

Another City on Weekly Pass Plan

The $1 weekly pass plan was put into effect in Meadville, Pa., on May 1 on the lines of the Crawford County Railways operated under lease by the Northwestern Pennsylvania Railway. The returns from sales for the first week were 10 per cent over the receipts for the previous week. The tickets are sold in stores and banks as well as in the cars and office of the railway. There is no change in the ticket and cash rate, namely 10 cents cash, with six tickets for 50 cents. The weekly pass plan for Meadville was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 22.

City May Lower Fare by Enacting Ordinance

In an address before the Denver Bar Association on the regulation of public utility rates recently H. Robertson, attorney for the Denver (Col.) Tramway, said that the City Council may at any time enact an ordinance regulating the fare at a lower figure than 8 cents authorized by the decision of former Federal Judge Robert E. Lewis. He pointed out that if the Council and the city enact a fare that in the opinion of the tramway is confiscatory, the tramway will, as it has in the past, go into the courts and attempt to have the fare declared confiscatory. The burden of proving that a fare is confiscatory, Mr. Robertson said, always rests upon the tramway.

Mr. Robertson said the tramway's position in the recent fare litigation was that the city of Denver did not have the power to contract with a public utility with regard to rates and that the city could not enforce the 5-cent fare ordinance as a contract. A contract, he said, the courts would enforce regardless of whether the rates were confiscatory, but when the power of the city over rates is merely regulatory, he said, the courts are the final authority.

Transportation News Notes

Seven-Cent Fare to Continue.—Patrons of local lines of the Ohio Electric Railway will continue to pay a 7-cent fare for at least six months. The original grant of increased fare made two years ago was extended the fourth time by City Commissioner. Negotiations are under way for the sale of the property to eastern interests.

Six-Cent Fare Reduction.—The Gary (Ind.) Street Railway has received the permission of the Public Service Commission to reduce the fares from all parts of Gary to the Cudahy Chemical plant on Cline Avenue and the L. C. L. railroad yards on West Ninth Street. The present fare to the Cudahy plant and to the L. C. L. yards is 16 cents. The reduced fare will be 10 cents under a fifty-ride ticket plan, tickets will be good for ninety days.

Will Place Traffic Markers.—The Houston (Tex.) Electric Company will soon place iron cone-shaped traffic markers to designate the safety zones on all street corners in the downtown section of the city where street cars stop to discharge or take on passengers. Wooden platforms are now in use, but it has been found that these platforms are inadequate. The City Council has just approved a request from the company for authority to purchase 150 such traffic markers at a cost of $10 each.

Automobile Interference: The Cause.—From April 16 to 30, inclusive, there were 111 accidents on the Pacific Electric lines within the city limits of Los Angeles, according to a report filed on May 10 with the City Clerk by S. A. Bishop, general claim agent of the Pacific Electric Railway. The report showed that eighty-eight of these accidents were caused by collisions between street cars and automobiles, while most of the remaining accidents were attributable to women falling from street cars.

Temporary Lower Rates Asked.—With a view to stimulating traffic between Gary and Valparaiso, Ind., and between Valparaiso and the lakes surrounding it, the Gary and Valparaiso Interurban Railroad has filed an application with the Indiana Public Service Commission for permission to put in a lower schedule of rates beginning on Memorial Day and extending to Labor Day. The new rates will make the fare between the two cities 3 cents cheaper than the fare over the Pennsylvania Railroad for the same haul.

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Personal Mention

L. T. Peck Retires as President

Continues With the Honolulu Rapid Transit & Land Company as Its Board Chairman

Announcement was recently made in far Hawaii by the Honolulu Rapid Transit & Land Company of the retirement after twenty-one years of valued service of L. T. Peck as president and his appointment as chairman of the board, with continuing oversight of the financial affairs of the company.

Mr. Peck was born in Brooklyn, N. Y., in 1860. He attended public and private schools there and in Milwaukee, where he was graduated from the high school. His first executive position was that of manager for eleven years of the company which established the Ohio Valley town of Kenova, in West Virginia, to which he gave its unique tri-state name.

As an outcome of a pleasure trip to the Hawaiian Islands in 1900, he became interested in the plans of the newly formed traction system in Honolulu. He returned there shortly from West Virginia, and was appointed treasurer of the company and chairman of the executive committee of its directorate. In 1904 he became its president.

MODERNIZES SYSTEM

From 1890 Honolulu had been served by an English tram company using antiquated mule-drawn cars upon 12 miles of lightly constructed single track. The fares varied from 5 to 15 cents, the main route being about 15 miles in length.

In 1903 the transit company bought out and scrapped the tram lines, substituting its own, which consist of more than 30 miles of track very substantially built and equipped and well-maintained.

Service has always been provided (with 5-cent fares and free universal transfers) which has been satisfactory to the community and generally regarded as exceptional by tourists from many lands who visit Hawaii at all seasons of the year. No strike has ever occurred.

Operating costs have been relatively high compared with those of mainland cities of like size, yet the patronage and economies have been such that dividends have been regularly paid for eighteen years, the annual rate after 1912 being 8 per cent, based for several years past on a capital stock issue of $2,000,000, which includes $892,500 representing earnings used for extensions. The company has no debt. Its bonds, issued in 1902 and 1903, were redeemed in 1917.

Years ago Mr. Peck invented the "zone" transfer ticket, which has invariably prevented irregular circuit riding on a single fare over the Honolulu system. It was described in the ELECTRIC RAILWAY JOURNAL of Oct. 20, 1907, page 857. He has attended several conventions of the American Electric Railway Association.

Under the title of "Honolulu Rapid Transit Company, Ltd.," the traction system is entering upon a new era of operation under a recently enacted "fair-return-on-fair-value" franchise which provides for control by the utility commission with constant right of purchase reserved to the municipality, and with right of amendment and repeal reserved to the Legislature of the Territory of Hawaii and to the United States Congress.

During his long connection with the rapid transit company, Mr. Peck has also been active in other business fields, in which he continues, especially as president of the First National Bank at Honolulu, which is the chief depository for the United States Government in Hawaii. During the war period he served as chairman of the Territorial Central Committee for the Liberty and Victory Loans.

L. T. PECK

Transition from Conductor to Physician

Conductors have many times become railway presidents; they have become newspaper editors; they have, upon occasion, become bank directors. John T. King, who officiates for the Minneapolis (Minn.) Street Railway, however, is almost a doctor. He has now only three years more in the medical college of the University of Minnesota, one year of interneship, and three years of special study in Europe before he is ready to start upon his career as a medical specialist in diseases of the blood. As if conductoring and attending college were insufficient to keep a real man busy, Mr. King attends night school where he studies shorthand so that he may take down his medical lectures more fully. Mr. King is married, and is buying a home in Minneapolis. He has already worked his way through high school.

And though Mr. King is chiefly interested in red corpuscles and in determining the correct amount of iron the blood should contain, he rings up each fare as if his sole concern in life were receiving the money, registering the passenger, and notifying the motorman to stop at the next block.

Dr. Winslow Directs Health Work of Safety Institute

The Safety Institute of America announces the appointment of Dr. Charles Edward Amory Winslow as health supervisor. He will have charge of the new work planned by the institute, which includes, in addition to the prevention of accidents, the study of influences which affect the health of industrial workers.

Dr. Winslow, who will supervise this new branch of the Safety Institute's work, has for many years been a conspicuous figure internationally in the field of health and sanitation. In addition to his connection with the institute, Dr. Winslow is at present professor of public health of the Yale School of Medicine, lecturer at Teachers' College of Columbia University, chairman of the New York State Commission on Ventilation and senior sanitarian of the United States Public Health Service Reserve.

Quarter Century of Service

Although the Louisville (Ky.) Railway has had some strikes in the past twenty-five years, it has a total of eighty-seven men who have been with it for a quarter of a century or more. Of this number six are conductors, twelve motormen; two colored janitors, fifteen trackmen; four carhouse foremen; eight office employees; seven power house employees; twenty shop employees; twelve inspectors. Jacob Fishbach ranks first in years of service. His employment dates back to 1868. Mr. Fishback is with the transportation department. The Louisville *Courier Journal* devoted an entire page in one of its issues to illustrations showing these various groups of old employees and one group of the six members of the Co-operative Welfare Association's general committee.

Farewell for Mr. Colton

J. W. Colton, new editor of *Aera*, the publication of the American Electric Railway Association, was the honor guest at a dinner at Hotel Heublein, Hartford, Conn. The hosts were his associates on the Hartford *Times*, on which he has been one of the editors. Mr. Colton assumes his new duties at once.

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The Biggest Job of Its Kind in the World

Nearly Four Hundred Miles of Municipal Electric Railway at Detroit Now Under Management of Joseph S. Goodwin, Who Began His Career as a Trainman

JOSEPH H. GOODWIN has been chosen to manage the entire street railway service in Detroit, Mich. It was logical that he should have this post for he has had charge of the original system of 100 miles of municipal lines in Detroit since construction of the city's system was begun there. It may be only a coincidence—and it probably is—but "Joe" Goodwin is a man after Mayor "Jim" Couzens' own heart. Mr. Goodwin has come up from the bottom.

Started as Motorman

This man upon whom will now fall the responsibility for operating the largest system of municipal street railways in the world was a motorman back in 1895. Even now he is only 45 years old. But into those forty-five years has been packed a world of experience. If "Joe" Goodwin had not been progressive he would still be a motorman. He improved every job he ever held, and when he couldn't improve the job he was on, he got another job. He didn't always stick to the railway business either. And strange to say, he had made up his mind to quit the railway field altogether and had set the date for so doing, when a telegram from Detroit brought the first intimation that a new kind of opportunity in the railway field was to come to him and hold him.

All these years up to the time of his appointment to the Detroit post in 1920, Mr. Goodwin had been dreaming how he would run a railroad if the opportunity came to him to have the final say-so. And it did come to him with his appointment to the Detroit municipal railway. The sponsors for the municipal railway admitted they knew little or nothing about railroading. They picked a man for the job in whom they had confidence and they left him pretty much to himself to work out his own salvation. This was just what Mr. Goodwin wanted. It was an experience new to him in many respects, for although his reputation had been established as a worker and a handler of men, never before had the opportunity been presented to him to put into execution some of the ideas of management and men that had been developing with him since the days when he was on the front platform of a car himself.

Exponent of One-Man Car

A volume might be written on the trying experiences of the starting of operation of the original municipal railway system in Detroit, and if such a tome were composed it would be largely a eulogy of the accomplishments of this man Goodwin from New England. He was one of the first electric railway operators to realize the place of the one-man car as a transportation agency and also one of the first to recognize that transportation can be sold like any other commodity. His methods, particularly in selling transportation, were a revelation to Detroit.

Mr. Goodwin is an indefatigable worker. His physical energy knows practically no bounds. Best of all he is approachable. Here is where he shines with the rank and file among men. They know that "Joe" Goodwin knows, for they know that he has been through the mill. Like nearly all other men of his kind Mr. Goodwin goes direct to the heart of things. He reaches by intuition, if you will, in a few seconds a conclusion that others would arrive at only after going laboriously through the dull processes of ratiocination. Such a man is always a mystery to some. They appreciate his worth, but to them the talent by which he succeeds is apt to appear uncanny.

J. S. Goodwin

But it has been said that "Joe" Goodwin was a motorman. So he was. As previously related this was back in 1895. It was on a road in Massachusetts that he served first. Then Mr. Goodwin moved over into Rhode Island in the same kind of work. In 1901 Mr. Goodwin was still a motorman. This time he was with a road in Connecticut. When the opportunity came for advancement Mr. Goodwin was found ready and waiting. He became a dispatcher. Shortly thereafter the "Who's Who in the Railway World," as the JOURNAL'S biographical file of operating officials is known, records that Mr. Goodwin had become manager of the Hartford & Springfield Street Railway at Warehouse Point, Conn. In 1917 he was made manager of the lines of the Connecticut Company in Bridgeport. This has always been one of the most difficult of that company's properties to handle. This in brief is the record in railroading of the man now responsible for running the local lines in Detroit. His career does, however, include a period when he was engaged in commercial pursuits for a Boston firm with his headquarters at Hartford. It is a big undertaking, this managing all the Detroit lines that has been handed to Mr. Goodwin, but it may confidently be expected that Mr. Goodwin will make good at it. That is what "Joe" Goodwin has been doing all his life—making good. A large factor in that process has been his energetic aggressiveness and willingness in capitalizing the advantage of any new development in the art.

Nothing that will improve operating efficiency is being overlooked on the Detroit Municipal, for the whole organization is to a remarkable degree a unit with him in the single purpose of making the municipal system a success—a success as measured by the standards and equivalent requirements of private operation. Regardless of one's views on the wisdom of municipalization of the street railways of any community, one cannot but note with admiration the real accomplishment and service principles that reflect to Mr. Goodwin's lasting credit in Detroit.

The details of other organization assignments in connection with the operation of the municipal lines in Detroit are published elsewhere in this issue.

"It Isn't a System. It's a Man"

Thomas E. Mitten is the subject of a sketch by A. St. John in *Barron's* for May 15 in the department "Men in Wall Street's Eye." Nothing that is new to readers of the ELECTRIC RAILWAY JOURNAL is told by Mr. St. John about the career of the president of the Philadelphia Rapid Transit Company in electric railway work, but the sketch is very entertainingly done. For that matter, the barest facts about Mr. Mitten make entertaining reading.

Mr. St. John says that in view of Mr. Mitten's great success in Philadelphia the question naturally arises why his system cannot be put into effect elsewhere. Mr. St. John answers this by saying that Mr. Mitten himself believes that his success is due to a system workable anywhere, but, says the writer, this belief is not shared by everyone else. As evidence of this Mr. St. John cites the remark of one man when it was suggested to try the Mitten plan of management in another large city. This man's reply was: "It isn't a system. It's a man."

E. A. Butler Resigns

E. A. Butler, for the last two years trainmaster of the Interstate Public Service Company, Indianapolis, Ind., on its lines south of Seymour, has resigned. He will be succeeded by George D. McLean, who has been with the corporation for fifteen years, but on the north end. Mr. Butler plans to engage in business at Columbus. Mr. McLean will have his headquarters in New Albany.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Changes in General Electric Directorate

C. A. Coffin Retires as Chairman and Is Succeeded by O. D. Young—E. W. Rice, Jr., Succeeded as President by Gerard Swope

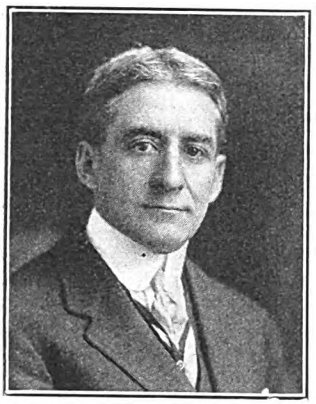
Following a meeting of the board of directors of the General Electric Company, held in New York on May 16, C. A. Coffin retired as chairman and was succeeded by Owen D. Young, long associated with the company as vice-president. The position of president was filled by the election of Gerard Swope, president of the International General Electric Company, succeeding E. W. Rice, Jr., who requested to be allowed to devote his entire energies to the further upbuilding of the scientific, engineering and technical phases of the company's work and who will become honorary chairman of the board of directors. Anson W. Burchard, for many year identified with the company as vice-president, with particular reference to public utilities and foreign investment, was elected vice-chairman of the board. J. R. Lovejoy, vice-president in charge of sales, was elected a director, as was also G. F. Morrison, vice-president.

Mr. Coffin, the retiring chairman of the board, was one of the organizers in the early eighties of the Thomson-Houston Electric Company, one of the predecessors of the General Electric Company. With several associates, for the most part business men of Lynn, Mass., he became interested forty years ago in the electrical inventions of Prof. Elihu Thomson and took a most active part in the direction of the company formed to develop these inventions. Upon the consolidation in 1891 of this company and the Edison General Electric Company to form the General Electric Company, Mr. Coffin became its president and continued in that office until June, 1913. In that year he retired to make place for E. W. Rice, Jr., and became chairman of the board.

E. W. Rice, Jr., who now has retired from the presidency, also came into the organization through the Thomson-Houston Electric Company, having been an assistant previously to Professor Thomson. He is also an inventor himself, having taken out more than 100 patents, and has given special attention to the engineering side of the work of the General Electric Company. His engineering ability and judgment enabled him to direct most successfully the engineering policy of the company. This is notably so in the case of the development of the tungsten lamp, steam turbine and a.c.-d.c. distribution. Mr. Rice was president of the A. I. E. E. in 1917-1918.

Mr. Young, the new chairman of the board, is a lawyer by profession. He was born in Van Hornesville, N. Y., on Oct. 27, 1874, and is a graduate of St. Lawrence University and Boston University Law School. He began the practice of law in Boston in 1896 and lectured on the subject of law in Boston University from 1897 to 1904. In addition to his interest in the General Electric Company he is chairman of the board of directors of the Radio Corporation of America, director of the Electric Bond & Share Corporation, Bankers' Trust Company and many other organizations. He was a member of the committee of one hundred of the American Electric Railway Association in 1919-20 and took an active part in its work.

Mr. Swope, the new president, has had both an engineering and commercial training. He was born in St. Louis, Mo., on Dec. 1, 1872, and received his elementary education in the local public schools and was graduated from the Massachusetts Institute of Technology in 1895. That fall he entered the employ of the Western Electric Company. Starting from the bottom in the shops at Chicago, where he was first assigned, he worked his way up department by department to an executive position. His first promotion was to the power apparatus engineering department as designing engineer. Next he organized and was first manager of the company's St. Louis house, opened in 1901. Four years later he was called back to Chicago and made manager of the power apparatus department. When in 1908 the company went out of the power apparatus field Mr. Swope was transferred to New York as general sales manager, and in 1913 he was elected vice-president. This connection he severed Jan. 1, 1919, to become president of the International General Electric Company.



GERARD SWOPE

OWEN D. YOUNG

E. W. RICE, JR.

E. P. WALLER

E. P. Waller Made Manager of Railway Department

E. P. Waller has recently been appointed manager of the railway department of the General Electric Company, of which department he has been assistant manager since 1912. J. G. Barry, who has heretofore held the two positions of general sales manager of the company and manager of the railway department, will devote his entire time to the work of the sales managership.

Mr. Waller was born in Martinsville, Va., and was graduated from the Virginia Polytechnic Institute in the class of 1900. Following his graduation he entered the testing department of the General Electric Company at its Schenectady Works. After two years in the testing department he joined the staff of the publication bureau, assisting in writing and editing bulletins, instruction books, technical letters, etc. When the *General Electric Review* was instituted he became associate editor. In the fall of 1903 Mr. Waller took up commercial railway work.

Mr. Waller has for many years been active in the committee work of the American Electric Railway Association and he is a member of the Engineers' Club of New York.

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It Pays to Attend Auction Sales

One electric railway company in a large city has paid special attention to auction sales of material suitable for the stock room and repair shops. The advertisements relating to these sales are carefully watched in the head office, and if any sale looks promising the supperintendent of equipment or other competent officer who knows the value of materials attends the auction. Here are some of the prices paid during the last six months or so for some equipment:

Carbon steel drills up to ⅝ in. diameter, 30 cents a dozen; a 2⅛-in. high speed drill, which normally would cost $35, $5; some smaller drills which would cost about $6, 30 cents each; a miscellaneous lot of high-speed tool steel, 187 lb. for $3; lathe dogs of different sizes, 10 cents each; emery wheels of different sizes, 10 cents to $1 each; hack saw blades, which naturally would cost $3.50 a dozen, 14 cents a dozen; taps, from a half cent to 5 cents each; wood band saw, which normally would sell at about $300, $87.

Some Figures on Tin Production

For many years British Malaya contributed more than one-half of the world's tin supply, and today the Federated Malay States still hold first place as the largest individual producers, though the export has fallen from 50,837 tons in 1908 to 34,446 tons in 1921. The tin-ore exported from the hinterland is smelted in Penang and Singapore, and Straits tin takes the highest rank in the metal markets. Tin exports from the Straits Settlements ports to the four main importing countries are:

	1913 £	1918 £	1919 £	1920 £
United Kingdom	7,039,338	3,199,592	4,823,872	4,006,851
United States..	3,565,588	10,493,452	6,991,629	8,527,794
France...	519,129	1,773,173	700,342	843,663
British India and Burma.	372,772	428,664	596,802	649,635

In considering these figures, allowance must be made for the lack of shipping facilities to Europe and for other war influence.

The amount of tin exported from the various ports of the Straits Settlements for the years 1913 to 1920 inclusive averaged 61,709 tons per year.

Electrification Considered for National Railways of Mexico

Engineers are making a study of the practicability of electrifying two or more divisions of the National Railways of Mexico. It is stated that the power for the purpose of operating trains may be obtained from the plants of the Guanajuato Electric Light & Power Company and the Northern Power Company, which are situated in proximity to the two or more important divisions of the railroad system. There is a surplus of power available at these plants, but should it be found that the National Railways can obtain cheaper power by constructing its own hydro-electric plant this will be done. An abundance of water power is available at different localities adjacent to the divisions which are to be electrified.

$45,000 for Equipment

The International Transit Company, Sault Ste. Marie, Ont., has purchased five new modern cars at a cost approximately of $45,000. The cars will be placed in operation as soon as they arrive. They are equipped with the latest devices, are constructed of steel throughout and are furnished with air brakes and automatic steps.

Reports Equipment Will Come from U. S.

It is reported by an official of Harbin, Manchuria, that the contract for electrical equipment for the tramways of that city, including the power plant, has been awarded to the Hua Sheng Trading Company, representing an American firm. The amount involved is $2,270,000 gold. The above-mentioned company is composed of Chinese and American interests, and the equipment for this contract will come largely from the United States.

Houston Lines to Be Double-Tracked

The Houston (Tex.) Electric Company has placed orders for steel for improving its lines under the agreement with the city by which a sixteen-year extension to its franchise was granted, and 300 tons of steel rails are now en route, according to W. E. Wood, general manager. The steel will be used in relaying and extending the double-track line on North Main and Louisiana Streets and in relaying the Leeland line. Double tracking of the Harrisburg line will come next, Mr. Wood said. The company has been granted authority by the City Council to double track its line on West Alabama and Roseland Streets at a cost of $3,900 and also to double track the same line on Hawthorne Street from Tact to Audubon, at a cost of $3,800. Under the agreement of the traction company with the city by which the franchise was extended sixteen years approval of all expenditures must be given by the City Council.

Metal, Coal and Material Prices

Metals—New York	May 16, 1922
Copper, electrolytic, cents per lb.	13.25
Copper wire base, cents per lb.	14.75
Lead, cents per lb.	5.425
Zinc, cents per lb.	5.475
Tin, Straits, cents per lb.	30.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$6.75
Somerset mine run, Boston, net tons	3.50
Pittsburgh, mine run, Pittsburgh, net tons	....
Franklin, Ill., screenings, Chicago, net tons	4.125
Central, Ill., screenings, Chicago, net tons	....
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.75
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	96.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	90.00

Rolling Stock

Department of Street Railways, Detroit, Mich., will probably purchase about 200 additional motor cars early this summer.

Springfield (Mass.) Street Railway is making over between twenty and thirty cars of the double-truck type into one-man cars.

Los Angeles (Cal.) Railway is planning to have the first twenty-five cars of the order of fifty of 1,200 type in operation for the Christmas holiday rush traffic. The new cars are practically the same type as the original twenty-five now in service. They will seat fifty-four passengers each, have an inclosed center section with opened sections at front and end. All the new cars will be equipped with multiple unit control. These cars are being built by the St. Louis Car Company and were mentioned in the issue of May 6.

The Buffalo & Lake Erie Traction Company, Erie, Pa., the Erie Electric Motor Company, the Erie City Passenger Railway, the Erie, Reed Park & Lake Side Street Railway and the Buffalo & Lackawanna Traction Company have been ordered to contract with the J. G. Brill Company for twenty-five one-man safety cars for operation by the Erie & Suburban Railway in the city of Erie, Pa. The agreement for the leasing of the cars and payment provides that the cars are to be single-truck, double-end, equipped with Birney safety motor car bodies complete with G. E. 264-A motor equipment, K-63 double end control, G. E. air brakes and safety devices, C. P.-25 compressors and Brill No. 79 E-1 trucks. Mention of this order is made elsewhere in this issue.

Track and Roadway

Grand Forks (N. D.) Street Railway expects to rebuild within the next three weeks 1 mile of single track in paved area with new 70 lb. International steel ties.

Eastern Massachusetts Street Railway, Boston, Mass., is considering the question of extending the tracks of the company through Brookings and French Streets, Lowell, Mass.

Hutchinson (Kan.) Interurban Railway within the next month will re-tie and pave 4,500 ft. of track. The work will be a rock ballast job with 2 in. of rock asphalt material for the finish surface.

Holyoke (Mass.) Street Railway may be asked to relieve congestion in a busy quarter. A petition is before the Holyoke Board of Public Works calling for relocation of the tracks in Main street from Dwight Street to Cross Street. It is asked that the tracks be moved 4 ft. to the east to give room for two vehicles to pass abreast.

Gary (Ind.) Street Railway is planning to reconstruct its tracks on Broad-

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way from the Wabash Railroad to the north terminus at the steel mill gates. This track will be laid on steel ties in concrete and on 6-in. concrete foundation. It is also desired to build an extension on Ambridge Street north from Fifth Avenue to the gates of the American Bridge Company.

Millville (N. J.) Traction Company has been requested by the Borough Commissioners of Vineland to pave Landis Avenue or remove the tracks from that thoroughfare. The commission says that if this is not done it will take the matter up with the Board of Public Utility Commissioners. Business men of Vineland declare that they would rather have a uniformly paved avenue than the trolley tracks.

Cleveland (Ohio) Railway through its president, John J. Stanley, has announced that extensions are going forward. The company is building one of the extensions in the southwestern section of the city along Broadview Road and the other extension in the southeasterly section along Cedar Road. The extensions involve an expenditure of $200,000 and will add 2 miles of single track to the system.

Interborough Rapid Transit Company, New York, N. Y., through the Powers-Kennedy Contracting Corporation has started on the extension of the Queensboro subway from Grand Central Station to West Forty-first Street and Eighth Avenue. The contract was awarded for $3,867,138. The contractors have promised to rush the work and keep the streets clear of obstructions as far as possible.

Dallas (Tex.) Railway proposes that its next extension shall be a line out Lindsley Avenue through the East Side addition to connect with the Mount Auburn and Park View lines, according to W. M. Holland, president of the company. This line would traverse a section of the city now thickly populated and would afford car service to many residents now several blocks removed from the nearest line. The line would be about 1 mile long.

Tiffin, Fostoria & Eastern Electric Railway, Fostoria, Ohio.—The contract for the Columbus Avenue paving in Fostoria was awarded by the County Commissioners April 4. It provides for a 2-in. bituminous top on an 8-in. concrete base. The railway company will improve the street between rails of its track with stone with a tar or bituminous binding. Because the company's franchise in Fostoria is soon to expire and because of narrowed profits due to motor truck and motor bus competition, Fostoria and county officials agreed to permit the company to improve with stone.

Northwestern Ohio Railway & Power Company, Oak Harbor, Ohio, has secured the right of way south of Port Clinton, Ohio, for constructing about 2 miles of 22,000-volt transmission line. Work on this line will be started at once and when completed it will be possible to remove the present 22,000-volt line from Sixth Street, Port Clinton. Six miles of the overhead construction east from Port Clinton, Ohio, is being rebuilt, the 000 trolley wire being replaced by 0000 wire, which will greatly improve service in that section.

Utah Light & Traction Company, Salt Lake City, Utah, has begun its annual spring repair work on many of its tracks and the pavement coming under its control. Many important improvements are contemplated, including the re-laying of tracks in some sections and entire new roadbed construction in others. The company plans to use reinforced concrete slabs instead of laying paving blocks along the work. After the ties and steel have been laid the outside of the rail will be paved with cement slabs 4 ft. long and 18 in. wide. The inside slabs will be 1 ft. in width.

Connecticut Company, New Haven, Conn., is planning to tear up the tracks and bedding on Main Street, Middletown, and will put in a new bedding and replace the trackage. The cost will be in the neighborhood of $35,000 and the work will be done by the company's own work crew. The city of Middletown recently requested the Connecticut Company to put the line in proper condition before the city went ahead with the new reinforced concrete pavement on Main Street, for which the contract has been awarded at a cost of $135,000.

Power Houses, Shops and Buildings

Western Ohio Railway, Lima, Ohio, is adding 18 ft. to the 170-ft. smokestack of the generating station at St. Mary's.

Consolidated Gas, Electric Light & Power Company, Baltimore, Md., which supplies power for operating the cars of the United Railways & Electric Company, plans to extend its present substation in McClelland Alley. The contract for the electrical equipment has been awarded to the Westinghouse Electric & Manufacturing Company. It consists of a 16,000-amp., 25-cycle booster converter with an air blast transformer and switchboard. The converter will be installed in place of an 8,000-amp. unit which is at present in use.

Interstate Public Service Company, Indianapolis, Ind., operator of the Indianapolis & Louisville traction line, is planning to construct a freight terminal at Kentucky Avenue and South Street in Indianapolis, which will improve shipping facilities. The new terminal will be a one-story brick and steel structure with 420 ft. frontage on Kentucky Avenue. It will be 35 ft. wide and will cost about $90,000. Construction work will begin as soon as the contract is awarded. The aim, Harry Reid, president of the company, said, is to complete it as soon as possible so that congestion at the Market Street freight house can be relieved. Construction of the building will be under the supervision of the Interstate Terminal Realty Company, organized as a holding company, the capital stock of which is $90,000.

Professional Note

Arthur L. Mullergren, consulting engineer, formerly member of the firm of Benham & Mullergren, consulting engineers of Kansas City, announces the opening of offices at 555 Gates Building, Kansas City, Mo., and 1705 Equitable Trust Building, New York City, for a consulting engineer practice, specializing in electric light, power plants, etc. He will engage in the design and supervision of construction of such works and the making of investigations, reports, appraisals and handling rate cases.

Trade Notes

The J. G. Brill Company, Philadelphia, Pa., announces the resignation of W. M. Lycett as purchasing agent, effective May 15. B. O. Brill has been appointed as his successor.

Metal & Thermit Corporation, New York, N. Y., announces the removal of its Pittsburgh branch office from 1427 Western Avenue to 801-807 Hillsboro Street, Corliss Station, Pittsburgh, Pa.

C. W. E. Clarke, power engineer of Dwight P. Robinson & Company, addressed the American Society of Mechanical Engineers at the annual meeting at Atlanta on May 10 and 11 on boiler room performance and practice at the Colfax power station of the Duquesne Light Company.

The American Supply Company, Providence, R. I., has been appointed agent for the Providence district to represent the Quigley Furnace Specialties Company of New York, manufacturers of Hytempite. The Quigley products are warehoused in Providence for quick delivery to local points.

Westinghouse Electric & Manufacturing Company announces that in future copper coils only will be furnished for water-cooled transformers. These will be furnished at the same price as was previously charged for iron coils. The officials of the company consider the copper coils more durable than iron, and as these are to be furnished without increased cost to their customers a benefit of an average price reduction of about 4 per cent results.

New Advertising Literature

Poughkeepsie Paint Company, Inc., Poughkeepsie, N. Y., has issued a booklet describing the sanding filler "Filkote." The booklet also contains formulas for oil and japan fillers.

The J. G. Brill Company, Philadelphia, Pa., has recently issued Bulletin No. 259 descriptive of the Brill 77-E Truck and Bulletin No. 262 descriptive of the Brill No. 50-E Truck.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Volume 59 New York, Saturday, May 27, 1922 *Number* 21

An Attractive Car Is an Efficient Salesman

A FIRST-CLASS salesman does not depend entirely upon correspondence to sell his product, but knows that it is highly desirable for him to come into personal contact with the customer. The rolling stock of an electric railway is one of the essential points of contact between the railway and the traveling public. The general appearance of both the interior and exterior of cars should, therefore, be kept in a condition pleasing to present or prospective riders. The chief engineer of one of the largest electric railway properties in this country recently remarked that he had found that a well-painted car, kept in good condition so as to eliminate noise, is so good an advertisement that it increases the riding sufficiently to pay for the additional expense necessary to keep it in this condition. Unfortunately, it has seemed necessary during the past few years, in the interest of economy, to curtail painting programs. Only such cars have been selected for painting as were in the greatest need and a great amount of temporary painting has been done. This has interfered with the sales appeal of the cars.

Now, the painting of cars and the keeping of the paint in an attractive condition is an important factor in producing a pleasing appearance. Experience has shown, also, that paint can be maintained in good condition more economically by touching up and revarnishing at frequent intervals, rather than by burning off and repainting at long intervals. It is encouraging to note, therefore, that painting schedules are again being restored and arranged so as to interlock with the overhauling schedules of the car equipment.

Canadian Association Convention Affords Opportunity for Co-operation

THE eighteenth annual convention of the Canadian Electric Railway Association, which will be held at Quebec beginning June 1, should be attractive to railway men from the United States as well as those from the Dominion. That this is appreciated is shown by the scheduling of the meeting of the executive committee of the American Association at Montreal on May 31 and the probable meeting of the committee on way matters of the American Electric Railway Engineering Association at Quebec during the convention. At least one paper on the program will be presented by a man from the southern side of the border, and a number of United States manufacturers will have exhibits.

There has been for many years a strong feeling of fellowship between the Canadian electric railway men and the "Americans," as residents of the United States are often erroneously termed because of the lack of a convenient abbreviation for "resident of the United States." Operating men have crossed the border, to and fro, in the exchange of executive talent between the two countries. The bond of mutual respect and experience was strengthened by the Ottawa convention last year. It will be further strengthened at Quebec. In commemoration of the coming convention, this paper has gathered in one issue timely information regarding several Canadian properties, from Vancouver on the west to Sydney, 3,000 miles away on the east. This is appropriate not only on account of the convention, but because Canadian electric railways have been active sources of news in this field recently. The changing from the left-hand to the right-hand rule of the road in British Columbia, the taking over of the Toronto system by the municipality, the practically complete destruction by fire of the Levis County Railway's equipment, the return-current controversy in Winnipeg and the activities of "Hydro" in Ontario are typical items. There ought to be no lack of topics of interest at the Quebec meeting.

The choice of Quebec for this year's meeting is fortunate. The historic association and the uniqueness of the site and layout of the city furnish attractions of no mean strength. The visitors will also find in operation a prosperous and progressive railway system which is meeting local transportation needs under unusual topographical difficulties.

Proposal for a Higher Degree of Financial Accountability

WILLIAM Z. RIPLEY, professor of political economy at Harvard, in an article in the *North American Review* on the steam railroad situation, suggests that bondholders ought to have some share in the management, at least as regards those companies near bankruptcy. Of course it is easy to marshal against such a proposal a summary of the limitation of the rights of bondholders, to say that the bondholder has advanced money on certain conditions and that if these are fulfilled he has no other moral or legal claims upon the property, and then dismiss the matter from further consideration. But that doesn't dispose of the matter altogether.

Just at this time the way does not seem easy to a realization of the suggestion of the professor, but who can say that the proposal of today may not be the accepted fact of tomorrow? On this ground alone the proposal deserves attention. If the plan is economically sound it should not be difficult to bring it about. Loans are constantly maturing and being replaced by new ones, and the possible purchaser of the new issue, as a lender, could insist on any provisions which seemed to him better to secure his loan.

In the light of experience within the last ten years it does not seem unreasonable to say there has already been a tendency in this direction. Thus, in the case of the Interborough Rapid Transit Company, something like this occurred when the bankers acting for the lenders of

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the money laid down conditions about the payment of dividends while the loan was outstanding. In general, the feeling is not uncommon among bondholders in the utility field that the bankers who float bond issues should look out for their interests when they are in peril.

One critic of the professor's proposal declared that application of the plan would be followed by a revolution in finance because the greater part of business is conducted on a basis of about 80 per cent credit to 20 per cent cash. This argument proves too much. It is, of course, true that the risks which the stockholders assume are those that bondholders seek to avoid, though they do not always succeed in doing so. Moreover, where does the argument lead that the very carefulness that makes the investor a bondholder rather than a stockholder unfits the bondholder for the rôle of owner or part owner? The history of not a few reorganizations would seem to prove that the conservatism of bondholders who through foreclosure and reorganization have been converted unwillingly, perhaps, into owners has made them most successful in this rôle.

There is, perhaps, no keener student of the financial problems of the railroads than is Professor Ripley. His latest proposal may seem academic, but the suggestion should not be discussed with quite the air of abandon that some of the commentators upon it have assumed.

How the Distance Fare Differentiates the Passengers

NO LATER than our issue of Dec. 10, 1921, it was noted how a differential fare, such as the unlimited-ride weekly pass, gave a clue to the variety of customers served by an electric railway. The article also showed their degree of tenacity in using the service of the railway—or at least in paying for the privilege of using that service whether they actually used it or not. Now comes another confirmation of the value of any fare system which differentiates the passengers. This time it is from London, where they use the zone system.

It appears that at a recent meeting of the governing committee of the London County Council Tramways General Manager A. L. C. Fell produced some interesting figures to prove why the minimum fare, for which a ride of 1.2 miles was given, should be reduced to a penny instead of the inconvenient 1½ pence, a multiple coin fare, which is now in effect. The reason for the interest in this class of passenger fares lay in the fact that for the twelve weeks ended Sept. 28, 1920 and 1921 respectively, the number of passengers paying fares of 3 pence and upward showed an increase while the lower fare passengers dropped off. Translated into terms of distance, this meant there had been a loss in all grades of short-haul passengers, within the 1½ and 2 pence distances for which a maximum ride of 1.8 miles was permissible. On account of this showing the Tramways Council agreed to reduce fares by lengthening the stages. The penny stage was increased from 0.6 to 1.2 miles, the 2 pence stage from 1.8 to 2.4 miles and the 3 pence stage increased from 3.0 to 3.6 miles. This plan entirely eliminated the unwieldly and awkward multiple coin 1½ pence fare. The new fares became effective last December, and significantly enough the motor buses operating in the tramway are also followed suit.

Such news dealing with surface car travel is of more than passing interest even if it comes from the zone systems of London, for it shows clearly what every electric railway operator does not yet, but nevertheless should, understand, namely, that their patrons are made up not only of necessity riders but also of persons who are not compelled to ride. The latter are predominantly persons who can walk if they choose and each manager ought to have plans under way contemplating turning these walkers into riders. If he fails to cater to them, these people who constitute the cream of the traffic so to speak, and whose fares may mean the difference between a loss and a profit, he is selling his service on the basis of the minimum needs of the community instead of making it of the maximum benefit. No industry can be successful until some of its output is bought without compulsion.

Will Seattle Be Forced to Quit?

MUNICIPAL ownership and operation of the local railway at Seattle is the rock on which the ship of political ambitions is being wrecked in that city. In quick succession, since municipal ownership became a fact there, that city has had three Mayors—Ole Hanson, Hugh Caldwell and now B. J. Brown. Mr. Caldwell started out well to wrestle with the legacy which Mr. Hanson handed down to him, but he didn't get very far. As soon as he had been installed as Mayor, Mr. Caldwell employed a special investigator to inquire into the railway matter. The grand jury also took up the subject. The inquiry by the jury did not disclose any evidence that any one connected with the city administration had profited financially by the purchase transaction, but the jury did say that the Mayor and the Council had been slack in conducting the negotiations. As a result the Mayor recommended that the City Council take the steps necessary to secure relief from a contract which the jury considered to be incapable of performance according to its terms.

The unfeeling Council, however, took no action on this except to pass a resolution not to levy taxes for the support of the railway. It had ideas of its own with respect to the matter. The most important of these was that a 10-cent cash fare and an 8⅓-cent ticket rate would result in an income during 1921 of $6,704,642. At the close of the year, however, the receipts were from $300,000 to $400,000 short of this amount. The Council also thought that there would be $1,060,000 on hand last March toward the annual payment of the interest and the principal on the purchase price. On its prediction with respect to this amount the Council proved to be wrong by $500,000.

Mr. Caldwell says there can be no hope for a reduction in fare except by a revision of the terms of the contract by which the city took over the local lines. This is how the outgoing official sees it. The incoming Mayor, however, is for the 5-cent fare. He says the matter of a return to the 5-cent fare is one of the first problems that he will tackle when he assumes office. There the pretty situation stands.

Seattle certainly let itself in for a peck of trouble when it took over the local railway. Mayor-elect Brown may succeed where Mayor Caldwell has failed, but it seems more likely that the situation will eventually result, as Mr. Caldwell has predicted, in the turning back of the system to the original owners or the appointment of a receiver through failure of the city to live up to the terms of the purchase contract.

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PANORAMIC VIEW OF QUEBEC CITY FROM THE RIVER

Quebec's Railways and Their Power Supply

Growth of Local Transportation Has More than Kept Pace with that of Population—In Twenty-five Years, While Population Has Doubled, Car-Mileage Has More than Quadrupled, Number of Passengers Carried Has Sextupled and Gross Earnings Have Octupled

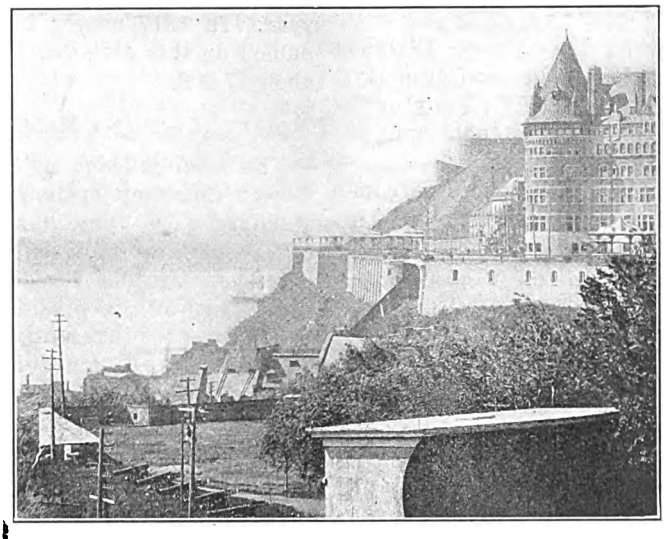
THE city of Quebec is the seat of government of the Canadian province of the same name and it is now well into the fourth century of its history. It was founded, in fact, the year after the Jamestown colony in Virginia; that is, in 1608. The founder was Samuel de Champlain, the explorer, after whom Lake Champlain was named.

The physical characteristics of Quebec have an important bearing on the local electric railway situation, for the city is built on two levels, known respectively as Upper Town and Lower Town. The city is situated on the eastern end of a narrow promontory which is bounded to the southward by the River St. Lawrence and to the northward by the valley of the St. Charles. The cliffs on the St. Lawrence side run up the river for many miles and average between 200 and 300 ft. in height.

The earliest buildings of Quebec were constructed along the narrow shore at the foot of Cape Diamond and gradually extended to what is now Lower Town. In many places in this section parts of the river bed have been reclaimed. Winding roads cut out of rock, and flights of steps, lead from Lower to Upper Town.

Quebec claims the distinction of being the only walled city in North America and it is probably the one which has preserved most closely the impress of its founder.

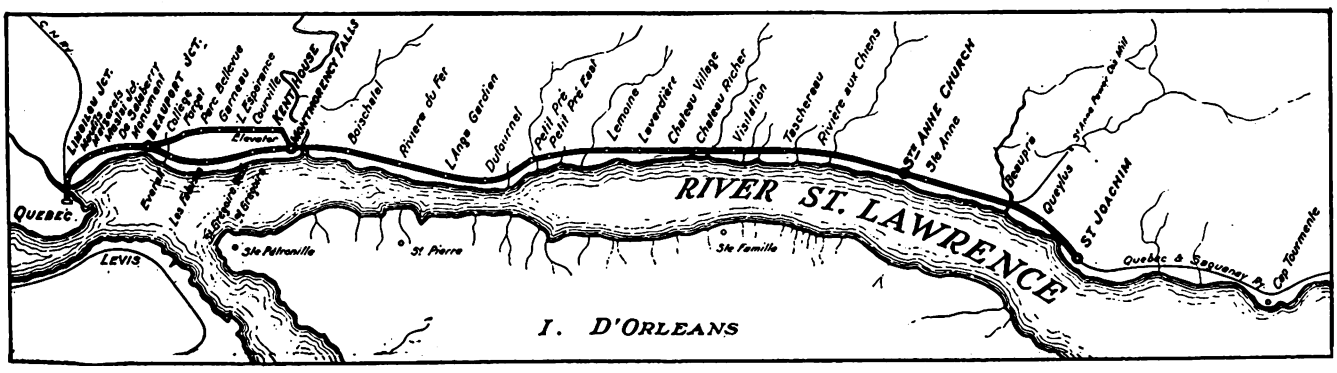
Electric railway service in and about Quebec is furnished by the Quebec Railway, Light & Power Company, which is owned and controlled through total ownership of stock by the Quebec Railway, Light, Heat & Power Company, Ltd., of which E. A. Robert was recently elected president.*



THE CITADEL AND BEYOND, WITH THE CHATEAU FRONTENAC AT THE RIGHT

The Quebec Railway, Light & Power Company comprises three divisions: (1) the City Division, operating the street railway lines in the city; (2) the Montmorency Division, operating a line of railway, both electric and steam, along the river between Quebec City and St.

*See issues of this paper for April 22, 1922, page 691, and April 29, page 733.



THE MONTMORENCY DIVISION OF THE Q. R., L. & P. CO. CONNECTS QUEBEC AND ST. JOACHIM ALONG THE NORTH SHORE OF RIVER ST. LAWRENCE

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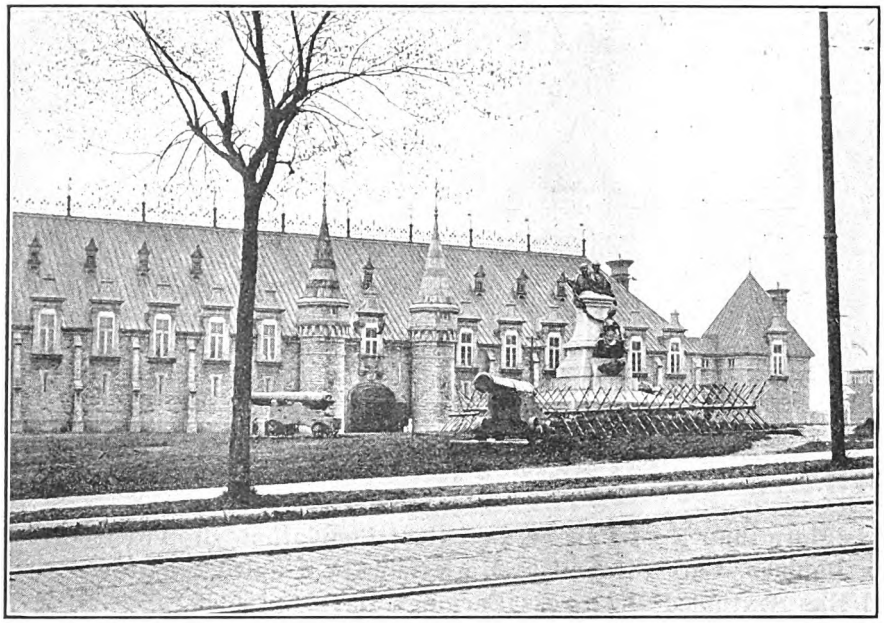


AT LEFT, THE DRILL HALL, WHERE THE CANADIAN E. R. A. WILL MEET JUNE 1.
AT RIGHT, THE ST. LOUIS GATE THROUGH THE CITY WALL

Joachim, which connects at the latter point with an exclusively steam-operated railroad known as the Quebec & Saguenay Railway, now forming a part of the Canadian National Railways, and (3) the Power Division, which supplies electric power for residential and commercial purposes in the city and surrounding district.

MORE THAN FIFTEEN MILLION PASSENGERS NOW CARRIED YEARLY

The city street railway, then the Quebec District Railway and now the City Division of the local property, commenced operations on July 20, 1897.* Its growth is clearly indicated in the accompanying table and its present extent in the map of the city lines.

The Montmorency Division is a suburban line comprising about 30 miles of track. It serves a thickly settled community along the river and handles a large volume of freight business. Its connection at St. Joachim with the Canadian National Railways is an important factor in its business.

This division transports somewhat more than one-seventh the number of passengers the City Division does, the annual peak of about 2,270,000 having been reached in 1920. The number fell slightly under 2,200,000 last year. In 1917 nearly 10,000 carloads of freight were hauled on this division, the number for last year being about 7,500.

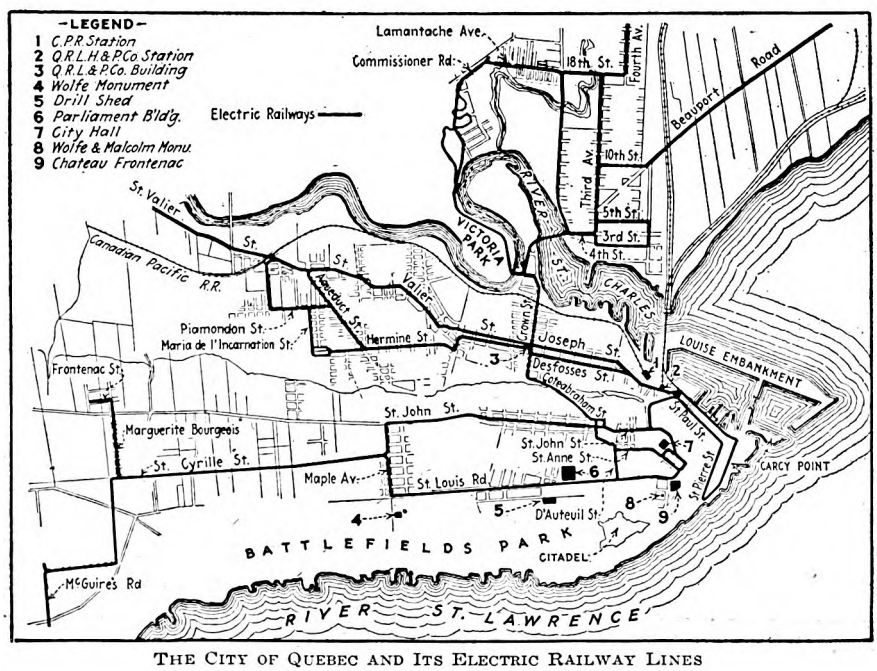
COMPANY MADE A PROFIT LAST YEAR

The total mileage of the Quebec Railway, Light & Power Company system is about 78 and its track is standard gage. One hundred and fifty motor and 220 other cars are employed in its service. Ten new pay-enter cars are due for delivery at about this time. In the report of the president to the board of directors recently issued and covering the year ended Dec. 31, 1921, the gross earnings were shown to be $2,757,836, an increase of $203,424 over the preceding year. The year's surplus was $87,513, as compared with a deficit of $33,172 for 1920. The present surplus is $684,413.

As the power and electric railway developments in Quebec have been closely related, a brief summary of them will indicate how the present organization has been evolved.

Back in 1884 there was a small electric lighting steam plant with two "T-H" dynamos located in an old military barracks beneath the fortification walls near St. John's Gate. It belonged to the Quebec & Levis Electric Company. The following year a hydraulic plant, under a head of about 130 ft., was installed at Montmorency Falls, 7 miles below the city. At first the lighting circuits contained only

*Readers of this paper will be interested in the account of the two horse railways, previously operating respectively in Upper Town and Lower Town, which appeared in the STREET RAILWAY JOURNAL "Souvenir Edition," October, 1895.



THE CITY OF QUEBEC AND ITS ELECTRIC RAILWAY LINES

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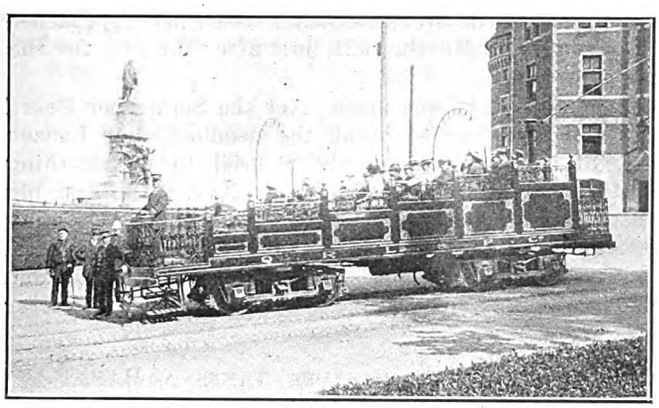
arc lamps, but in 1888 incandescent lamps were supplied with alternating current transmitted at 1,000 volts and distributed at 52 volts.

In 1893 the company became the Montmorency Electric Power Company, which in 1894 built a modern hydraulic plant, with a 6-ft. flume furnishing 170 ft. head. This was the plant that furnished power to the Quebec District Railway through motor-generators in a substation in Quebec. The flume was next carried to the brink of the falls, increasing the head to 190 ft., and a 300-ft. concrete dam was built.

An Early Steam Railroad Electrification

Next, in 1898, the power company, the District Railway and the Quebec, Montmorency & Charlevoix Railway (a steam road) were amalgamated under the name of the Quebec Railway, Light & Power Company.



A "Seeing-Quebec" Car Leaving the Chateau. Note the Grade of the Street on Which the Car Stands

The steam road was soon after (in 1900) electrified from Quebec as far as St. Anne de Beaupré, with consequent further enlargement of the Montmorency power plant. A 200-kw. motor-generator set was installed at St. Anne de Beaupré, 14 miles from the power plant.

Developments now came thick and fast. In 1907 a further development was made at the Natural Steps on the Montmorency River about a half mile above the Montmorency Falls plant, giving a capacity of 1,500-kw. Two years later the transmission was changed from two-phase to three-phase and at 23,000 volts. Scott-connected transformers were installed at Montmorency and Quebec to interconnect the transmission and distribution lines.

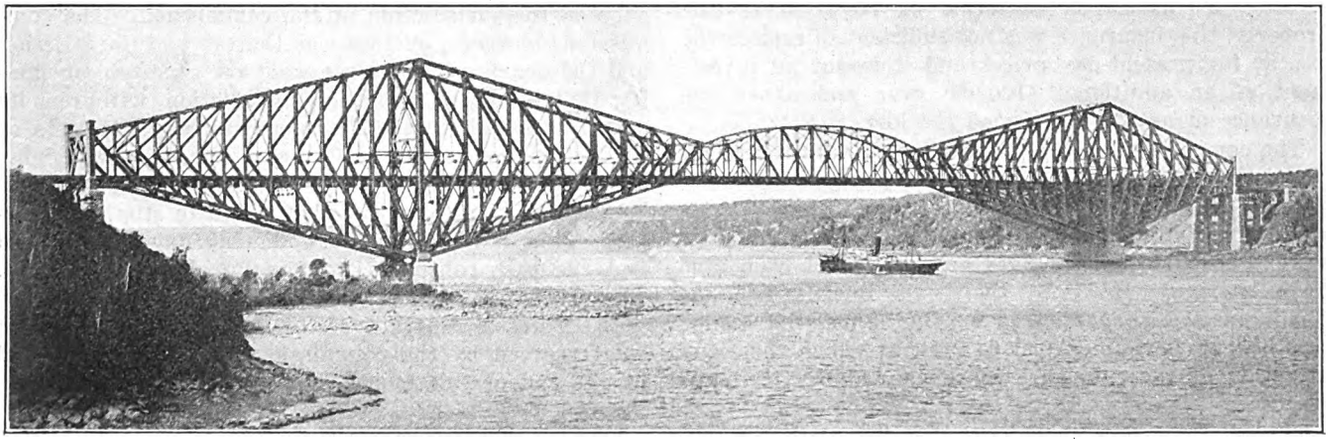
In 1909 a merger was formed of the Quebec Jacques Cartier Water Power Company, the Frontenac Gas Company, the Canadian Electric Light Company (of Levis, P.Q.,) the Quebec Gas Company and the Quebec Railway, Light & Power Company, forming the present parent company known as the Quebec Railway, Light, Heat & Power Company, Ltd.

Montmorency Falls, an Important Local Source of Electric Power

The Quebec Jacques Cartier Company has a power house 18 miles from Quebec City on the Jacques Cartier

OPERATING DATA FOR CITY DIVISION, QUEBEC RAILWAY, LIGHT & POWER COMPANY

Year	Annual Car-Mileage	Revenue Passengers Carried	Gross Earnings	Earnings per Car-Mile Cents	Quebec's Population
1897–1898	747,583	2,504,269	$113,874	15.23	63,000
1898–1899	996,874	3,394,163	147,086	14.66	64,500
1899–1900	1,105,776	3,453,576	149,440	13.50	67,000
1900–1901	1,089,450	3,715,675	159,877	14.50	68,000
1901–1902	1,112,361	4,192,799	179,111	16.10	68,700
1902–1903	1,170,031	4,424,124	187,656	15.15	69,400
1903–1904	1,138,546	4,457,761	190,218	16.53	71,000
1904–1905	1,156,777	4,619,771	201,312	17.40	72,300
1905–1906	1,220,254	5,054,223	214,461	17.57	74,000
1906–1907	1,274,856	5,374,421	233,770	18.34	74,800
1907–1908	1,332,210	5,910,121	255,676	19.18	76,100
1908–1909	1,394,744	6,859,679	287,494	20.61	76,700
1909–1910	1,602,455	7,169,245	302,975	18.89	77,600
1910–1911	1,656,524	7,857,680	351,442	21.21	78,000
1911–1912	1,782,928	8,785,995	379,492	21.28	79,400
1912–1913	1,967,554	9,908,674	425,401	21.62	81,200
1913–1914	2,136,220	11,276,975	488,852	22.77	83,000
1914–1915	2,089,489	11,242,483	483,136	22.95	85,500
1915–1916	2,122,183	12,278,607	523,525	24.67	89,000
1916–1917	2,299,258	13,165,318	560,954	24.40	94,000
1917–1918	2,164,136	12,671,372	545,547	25.21	103,000
1918–1919	2,179,575	13,334,247	643,958	29.54	105,600
1919–1920	2,298,144	14,112,706	764,392	33.26	111,094
1920–1921	2,392,256	15,387,497	907,275	37.93	115,426



The Famous Cantilever Bridge Near Quebec. The Central Span of this Fell During Erection The Predecessor of this Bridge Collapsed During Construction

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River, at Valcartier, with two three-phase generators of a capacity of 750 kw. each. Transmission to Quebec is at 23,000 volts, and there is a steam auxiliary plant in the city comprising three 350-kw. generators.

The Canadian Electric Light Company has a power development on the Chaudiere River, near Charny, with two 750-kw. and one 1,000-kw. three-phase generators, developing power at 11,000 volts, and transmitting 9 miles to a substation in Levis. The Levis and Quebec substations are connected by means of submarine cables across the St. Lawrence River.

From the Levis substation power is supplied to operate the Levis County Railway,* the Louise Dry Dock, and all electric requirements on the South Shore.

The Laurentian Power Company of Seven Falls, P.Q., also supplies electric energy to the Quebec Railway, Light, Heat & Power Company, Ltd., under contract. Seven Falls is approximately 35 miles from the city of Quebec.

Snow Removal Allowances the Stumbling Block

Rehabilitation of Levis County (Quebec) Railway Held Up Pending Agreement as to Amounts to Be Paid by Municipalities Served

BY H. E. WEYMEN
Manager Levis County Railway, Levis, Que.

THE editors of this paper have asked me to explain the developments on our property since the disastrous fire which occurred Feb. 21, 1921, and which wiped out our carhouse, shops and all of our equipment and rolling stock excepting four Birney and two converted one-man cars.† The succeeding events were as follows:

After the fire we were able to give only a partial service. This was on a twenty-minute headway on the Lauzon division and the up-town division and one of three-quarters of an hour or one and one-half hours on the Quebec Bridge division. The long headway occurred when one car was undergoing repair.

As all of our six cars were required to give even this limited service, we had no spares,

With the help of a newspaper campaign we prepared the way for a general meeting of the four municipalities and the Levis Board of Trade. The Board of Trade took the question up itself and appointed a committee to study the tramway question.

Although the company's loss was fully covered by insurance, as measured in terms of the cost of the property, this insurance was not sufficient to replace the loss at the present-day prices and it meant an investment of an additional $100,000 over and above the insurance money to make good the loss.

The company found itself unable to obtain this additional money unless there was some prospect of revising the franchise conditions under which it was operating. Two municipalities, St. Romuald and Lauzon, were opposed to any changes and would not even give us a hearing. However, the Levis Board of Trade finally invited all parties to a general meeting, which was held at Levis on April 6, 1921, at which the exact situation of the company was explained by Dr. Louis Herdt, consulting engineer, and other directors of the company.

The main point of the discussion was the cost of snow removal in winter, which is too heavy for the company to bear.‡ After this meeting, and allowing time for the situation to be discussed by the municipalities, a further meeting was called in July, at which each of the four municipalities made its offer. Three offered the company less than it had been receiving excepting the effect of a revised fare. The city of Levis only increased the allowance for snow removal.

The company, of course, was unable to finance the fire loss on these terms and the whole matter came to a deadlock. Another meeting was called in September by the Board of Trade and its committee, as a result of which a second delegation approached the Premier of the province, asking his assistance, supplementing the efforts of the first delegation which had approached the Premier in March, 1921, just after the fire, for the same purpose.

Repeated effort was made after the September Board of Trade meeting to break the deadlock, but Lauzon and St. Romuald absolutely refused to do anything further. In consequence, when on Nov. 9 the first big snowstorm arrived, the company was obliged to store its cars in a temporary shed for the winter. A local garage operated two buses from Levis Ferry to Lauzon, but on the remainder of the system no service whatever was given.

PROVINCIAL LEGISLATURE TAKES A HAND

In February, 1922, another delegation waited on the Premier asking him to do something to break the deadlock, and in consequence the Legislature passed a law giving the Public Service Commission jurisdiction. In the meanwhile, the city of Levis made another attempt to get the other municipalities to make an offer which would be acceptable to the company. This again fell through and late in March the city of Levis passed a resolution making a certain offer to the company which, if refused, would be referred to the Public Service Commission, together with the propositions of the other municipalities for arbitration and a judgment. Lauzon immediately took action in the civil court to cancel the company's franchise and force it to remove its track and equipment. In the meanwhile, the new law came into effect and the company agreed with the city of Levis to refer the whole matter conjointly to the commission with a request to it to bring the other municipalities into line. The case came before the commission on April 26, when Lauzon and St. Romuald opposed the jurisdiction of the commission. The commission, however, maintained that it had jurisdiction and the hearing of the case went on. Lauzon, on finding that the commission had jurisdiction, withdrew its action on condition that the company pay the costs of the action before the civil court. St. Romuald, however, refused to acknowledge the jurisdiction and took an injunction against the commission to stop the hearing. This, however, on the following day was refused and the case continued and finally closed on May 4. The company had Dr. Herdt as its expert, together with Professor Burr of McGill University. Judgment was reserved by the commission, but one is expected by the end of this month.

*An article on the Levis County Railway appears on this page.
†See issues of this paper for Feb. 26, 1921, page 429, and March 5, 1921, page 460.

‡In an illustrated article in the issue of this paper for April 3, 1920, page 699, Mr. Weymen explained the snow conditions involved in a Levis winter.

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Does a Small Company Need a Safety Supervisor?

Manager of Nova Scotia Property Says that the Essential Requirement for Successful Accident Reduction Is Conviction of Its Importance on the Part of the Executive

BY C. C. CURTIS
Manager Cape Breton Electric Company, Ltd., Sydney, N. S.

THE manager of an electric railway who does not have a keen, genuine and personal interest in the safety work of his organization is not only missing a lot of fun but is seriously reducing the overall efficiency of his men, and is probably wasting, in settlement of claims, money which might better be spent for the constructive purpose of preventing accidents. He is also neglecting an opportunity of getting in closer touch with his fellow-workers, learning their points of view and drawing out many who have the welfare of the company always at heart, but who too often do not find an opportunity of demonstrating this fact.

It seems inconceivable that there should be public utility managers left of those who only a few years ago apparently felt that a claim agent capable of driving a hard bargain was far superior to a claim agent intent on preventing accidents.

Probably the old type is extinct; in any event, let's assume that every one nowadays believes in preventive measures and would like to have a "safety first" organization functioning at all times. How is it to be done? Must a small company have a safety supervisor and an elaborate plan, or is there some simple way which will produce results? My only answer is to describe briefly one scheme which has worked, not the best we are free to admit, not perfect in all its details, but simple, inexpensive and workable.

A SIMPLE ORGANIZATION ONLY IS NEEDED

The Cape Breton Electric Company, Ltd., under Stone & Webster management since its incorporation in 1902, operates a street railway in the city of Sydney and through the towns of Glace Bay, Dominion, North Sydney and Sydney Mines, serving a total population of about 60,000. Included in the system is an interurban line between Sydney and Glace Bay, a distance of 14 miles. Two ferryboats are operated across the harbor between Sydney and North Sydney, a distance of 5 miles. The company distributes light and power in all these cities and towns except Glace Bay, where there has been a municipal plant for twenty years.

A little more than three years ago, after considerable thought and discussion as to the best way of organizing for safety, we decided that the only way was to go ahead and see what would happen. It was felt that fire prevention was in many ways so closely related to accident prevention that it should be included in our scheme, and experience has shown that it makes our work more interesting, and the results are extremely gratifying.

A central safety committee was appointed, consisting of the superintendent and assistant superintendent of the railway department, the master mechanic, the inspectors and foremen, the assistant treasurer, the light and power superintendent, the superintendent of distribution, the chief engineer of the power station, the line foreman, the meter foreman, the superintendent of the ferry department and a few others from all departments.

For the first year or more meetings of this central committee were held weekly, since then bi-weekly. The personnel changes slightly from time to time, but superintendents and foremen are always kept on the committee.

A clerk in the manager's office acts as secretary, keeps minutes of all proceedings and looks after the distribution of safety literature and copy for our

CAPE BRETON ELECTRIC COMPANY, LIMITED

Minutes of Safety Meeting of Night Trainmen—Sydney & Glace Bay Division

April 4, 1922.

Meeting opened in Sydney Lobby at 9.30 a.m. on Monday, April 3, by reading of minutes of previous meeting, which were approved as read. Mr. Bulley comments as follows: Last car to reach Henry Street should pull up far enought so that the rear end would be beyond the front end of the waiting car. Passengers alighting would then see car on other track before they started to cross the tracks. Complaints about cars should be reported on in and out sheets and if nothing is done then it should be taken up with Inspector. If he doesn't attend to it bring it up in Safety Meeting.

N. Munroe—Car 6 was not coasting Friday. H. J. McNeil—Doors on car 52 not fixed. M. McKenzie—Roof on car 203 still leaking in vestibule. Switch at Ashby Corner not plugged and car split it once in a while. The tongue is slightly bent. This will be attended to. Mr. Bulley referred to the newspaper report of a woman falling in a water hole at Ashby Corner. She fell in the puddle of water covering the sewer in front of McDougall's Store. This sewer is blocked and has been reported to the City Engineer. H. J. McNeil knows about it.

P. C. Leonard, nothing.

J. McKinnon—Water has made a rut along side of car rails on Prince Street. Autos run down this rut and do not attempt to turn out until the car is very near. They then find it is almost impossible to get out of the track. Mr. Bulley suggested that in cases like that the motorman take a few seconds to explain to driver how dangerous a practise it is to drive so close. This might help out in several cases.

Mr. Bulley read an article from a magazine comparing the stopping distances of street cars and automobiles.

J. A. McPherson, nothing; M. McKenzie, nothing. H. J. McNeil—New poles on Townsend Street above George should have stop marks repainted. Since doors of all cars are only open on one side of street the marks should be painted on left hand side coming from the Esplanade.

R. Richards—Hanger straps should be placed in small cars, Several missing.

J. A. McDonald—Sanders not working on all Bay cars. On some it does not throw on rails.

N. Munroe, nothing; P. Diggins, nothing.

H. Strickland—The Glace Bay crossing diamond is pretty rough.

A. Cameron—Gave an illustration where he opened ventilators as car was hot and some passengers thanked him. When collecting fares further down the car one passenger complained of cold so he had to close them. Mr. Bulley read an article from a magazine on Statler Hotel rules. A. Cameron brought up the delay caused by trainmen having to carry lantern, stool, headlight and tool box from one car to another when changing. If permanent places were made for lantern and tool box on each car then time would be saved. This will be looked into. Meeting adjourned at 10:55 a.m.

(Signed) E. O. SMITH

SAMPLE SAFETY COMMITTEE MEETING MINUTES

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general newspaper advertising, which includes a considerable amount of "safety first" propaganda.

The manager acts as chairman of all meetings unless unavoidably absent. At each meeting minutes of the previous meeting are read and approved, then anything left over is discussed and, if possible, disposed of. After that suggestions are called for and fully discussed. Recent accidents or near accidents are studied for the purpose of preventing similar ones in the future, and always the thought is stressed that most accidents and fires are preventable if only proper precautions are taken in advance. Each man is encouraged to think for himself and to put the principles which he learns into practice, not only in his daily work but in his home life as well.

Accident prevention and fire prevention are the principal topics discussed, but no other subject is barred when time permits. An opportunity is thus offered for all men present to learn something more than they otherwise would concerning the conduct of our business. An atmosphere of frankness prevails and all the cards are laid on the table. If wage reductions are necessary the reason therefore is clearly explained and our financial reports are studied like accident reports.

Aside from the central committee, each superintendent acts as chairman of a local safety committee, consisting of all the men in his department. Meetings are likewise held bi-weekly at such hours as will be convenient for the majority of the men. Trainmen, trackmen and carhouse men meet in this way and each becomes familiar with the problems of the other.

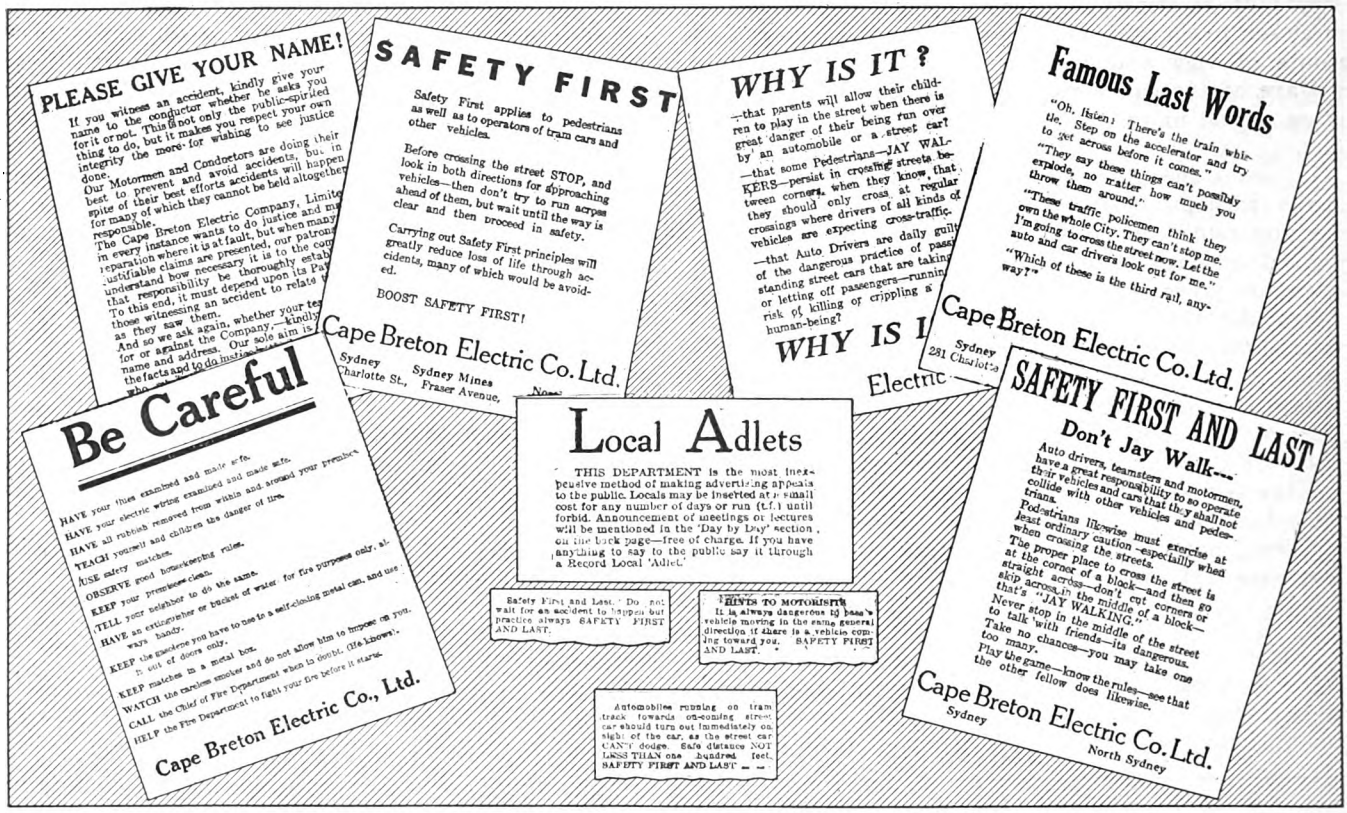
Recommendations made by the local committees are brought before the central committee for discussion and decision, but very often action has already been taken by the superintendent and no formal decision by the central committee or manager is necessary.

The idea is continually kept in mind that results are what we seek, and superintendents have ample authority to put into effect desirable suggestions without delay, provided of course that the expense is not prohibitive.

The time spent by men in attendance at meetings is at the company's expense except in the case of monthly men attending meetings held outside working hours, and such meetings are not frequent.

All Available Material Is Utilized

Our company is a member of such organizations as the American Electric Railway Association, the Canadian Electric Railway Association, the National Electric Light Association, the Canadian Electrical Association, the National Safety Council, the Canadian National Safety League, the National Fire Prevention Association, the Nova Scotia Accident Prevention Association, and the Society for Electrical Development, Inc. Through these organizations all kinds of material for the study of accident and fire prevention is constantly at hand and full use is made thereof.



SAMPLE ADVERTISEMENTS USED BY LOCAL RAILWAY IN SYDNEY, N. S.

Safety bulletin boards are placed at five or six main points on our property and bulletins prepared by the National Safety Council and the Canadian National Safety League are posted regularly so they may be seen by all who pass.

Safety calendars furnished by the National Safety Council have been purchased for the past three years and distributed to all our own men, as well as the schools in Sydney districts, public buildings, etc.

Material obtained from the National Fire Prevention Association is likewise given wide distribution among employees of our own company, and often sent out to the general public. About a year and a half ago we ordered from the National Fire Prevention Association

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illustrated leaflets entitled "Dwelling House Hazards," "The Evil Wooden Shingle," "Clean your Chimneys! Reduce Fire Waste! Save Fuel," "Chimney or Flues (A fable for Builders)," etc. These were distributed to employees and a bulletin was addressed to them by the manager. Last Christmas a considerable number of copies of an illustrated leaflet entitled "Holiday Fire Warning for the Home," and another gayly decorated poster—"Keep the Fire Demon Away," both prepared by the National Fire Prevention Association, were likewise distributed to employees and many outsiders. All this work we consider not only effective in preventing fires and educating our own men, as well as the general public, but it helps to give us a reputation for being progressive and public spirited.

Co-operation is extended to schools, police, fire departments, health departments, fire insurance companies and any other agencies which may be active in connection with special drives, such as are put on during "Clean-Up Week," "Fire Prevention Week," "No Accident Week," etc.

Our advertising space in three daily newspapers is devoted from time to time to educational work along accident and fire prevention lines. Display "ads" on the subject of general safety and fire prevention are run rather frequently, and "readers" such as "Hints to Motorists—Slow down and proceed cautiously when passing street corners, schools and bridges—Safety First and Last!" are interspersed with "readers" designed to encourage people to ride on the street cars.

First-aid work has not been neglected either, and frequent demonstrations have been made of the prone-pressure method of resuscitation. A year ago some ten or twelve of our men took the St. John ambulance course, consisting of six or seven lectures on first aid by a qualified physician, and most of them passed the resultant examination without trouble.

A weekly fire inspection is made of all our property, including power houses, substations, carhouse, yards, etc., and reports are turned in promptly.

In conclusion, this prevention work pays, and it's not difficult. A safety supervisor is not indispensable to a small company, but what is indispensable is a firm and never changing belief on the part of the manager that accident and fire prevention are a part of the day's work.

New Power Distribution Center for Montreal

Cote Street Substation, Recently Constructed at Load Center of Tramways System, Will Serve as Power Distribution Headquarters—Rotary Converters Used Rather than Motor-Generator Sets Installed in Several Other Substations of the System

FOR five years or more the Montreal Tramways has had in process a general remodeling of its power distribution system. This has taken the form of a comprehensive layout of the system as a whole, following the plan of a ring transmission with radial mains, the placing of a large part of the mains and feeders in underground conduits, the relocation and remodeling of the substations and equipment and the building of new substations to supply the increase in demand as well as to subdivide the power supply to prevent undue concentration.

The principal supply of power for the tramways is water power, but a reserve supply is maintained, mainly by means of the Hochelaga plant remodeled in 1918.

The development of the power distribution of the tramways up to and including 1918 was covered in a series of articles in this paper as follows: A general article on the system as a whole, Jan. 12, 1918, page 72; the conduit lines and substations, with particular reference to the St. Denis and Pointe aux Trembles substations, March 9, 1918, page 449, and the remodeling of the Hochelaga power plant, June 8, 1918, page 1085. In the March 9 article reference was made to a proposed Cote Street substation, regarding which no details had at that time been decided. This substation has since been designed, constructed and put into commission, being located at the center of gravity of the city load. It is more than a substation, because its location, both with respect to the tramways' main offices and the center of the load, brought about a decision to make it the headquarters of the power and distribution department, and the load-dispatching center of the system.

The station is not large, as substations go, the engineers having decided to limit its capacity to 8,000 kw. to avoid any large concentration of return current in one locality. The station also is manually operated, but the rotary converter equipment was designated to use flash barriers and other improvements added elsewhere particularly to facilitate automatic operation. In this case the extras were included as an additional precaution against flashovers.

This additional precaution was considered necessary because the station operates in parallel with others on the direct-current side and is supplied on the alternating-current side from several different sources. One supply is from the Hochelaga plant, which is operated in parallel with the system of the Montreal Public Service Corporation. Power is received also from the system of the Montreal Light, Heat & Power Company.

Flexibility Characterizes the Distribution System

The cutting in of the new substation involved a rearrangement of mains as indicated in Fig. 2. This diagram includes the essentials of the 13,200-volt switching facilities at Cote Street. The plan shows that one bus is assigned to the Hochelaga power plant, with which connection is made by four mains. Another bus takes care of the two mains from St. Denis substation. A third provides connection with the William Street power plant, and the fourth is a transfer bus with which connection is made from the lines of the Montreal Light, Heat & Power Company.

This substation is so designed that the high-tension system can be sectionalized. It can also be operated "selective."

A more detailed plan of the substation wiring is given in Fig. 1. This diagram can be visualized by means of the general substation plan, Fig. 4, and the

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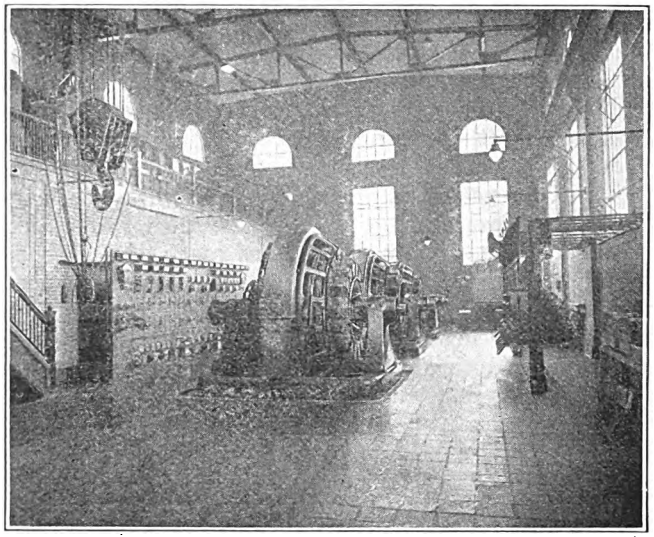
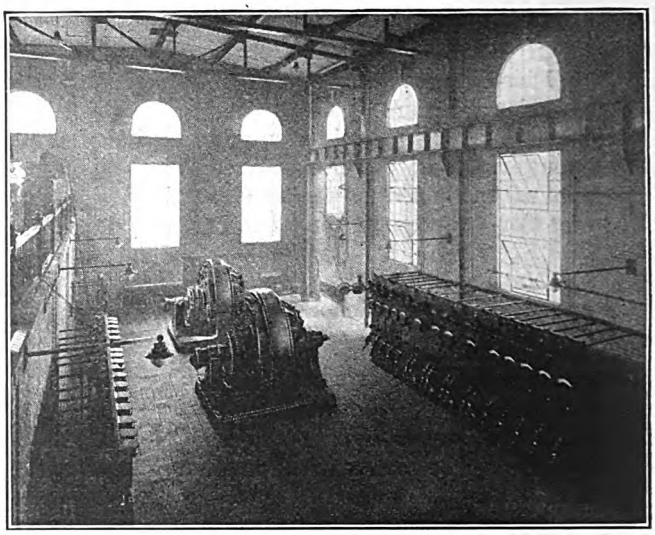


THE COTE STREET SUBSTATION IS CHEERFUL BY DAY AND NIGHT. ROTARY NO. 4 NOT YET PLACED



THIS PICTURE WAS TAKEN BEFORE ROTARY NO. 3 WAS INSTALLED IN THE COTE STREET SUBSTATION

cross-section, Fig. 6, as well as the photographs which are reproduced. For convenience of reference the type and sizes of the various pieces of electrical apparatus are given in the plan in Figs. 1 and 4.

The space within the building is subdivided in such a way as to facilitate supervision of the equipment and to give a general appearance of spaciousness. The rotary converters are on the main-floor level, supported on substantial concrete columns. Four 2,000-kw. six-phase General Electric rotaries are installed. The control switchboards are on vertical panels on the main floor, the direct-current board on one side, the alternating-current board on the other and convenient to the high-tension switching equipment, and the house service board at one end.

One side of the main floor is partitioned off for the high-tension bus compartments, the roof of this section forming a gallery where the high-tension circuit breakers are located. In the basement below the bus compartment is the high-tension cable room, and adjacent to this is the long transformer room stretching the length of the rotary room above.

The cells and barriers in the high-tension bus compartment are of reinforced concrete, the three flat busbars of one circuit being mounted one over the other in separate runs. The space above these conduits is occupied with vertical compartments for the disconnect switches, connections to the circuit breakers, cross connections between buses, etc.

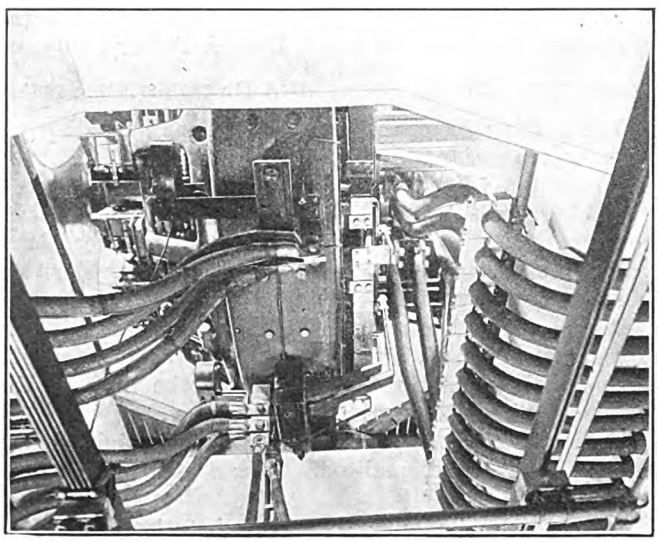
The feature of the bus arrangement is that it is possible to connect any distributing bus to either of the two main buses by means of selector disconnecting switches (double-throw switches) and the bus tie oil circuit breakers.

The rotary-transformer oil circuit breakers are directly connected to either of the two main buses by means of the selector disconnecting switches. Current transformers are placed between barriers, so as to give extra security. Asbestos cell doors are used throughout the bus compartments.

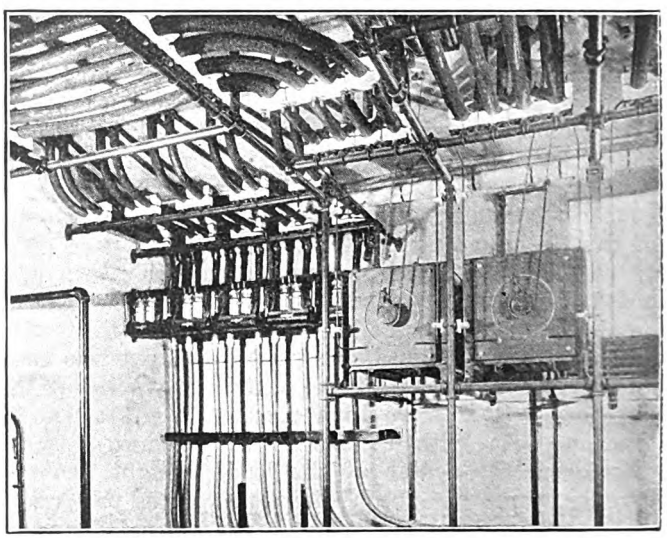
BUS AND TRANSFORMER ROOMS ARE LONG AND NARROW

The high-tension cable room, running along one side of the basement, is provided with cable entrances at each end. The risers from the cables to the oil circuit breakers are tapped in through lever disconnecting switches separated by asbestos barriers.

On one side of the cable room, against the transformer room, are the oil and water pipes for the banks



THE CONNECTIONS ON THE UNDERSIDE OF THE ROTARY ARE ARRANGED FOR CONVENIENT INSPECTION AND REPAIR



THE FIELD RHEOSTATS AND D.C. LIGHTNING ARRESTERS ARE LOCATED BELOW THE D.C. SWITCHBOARD

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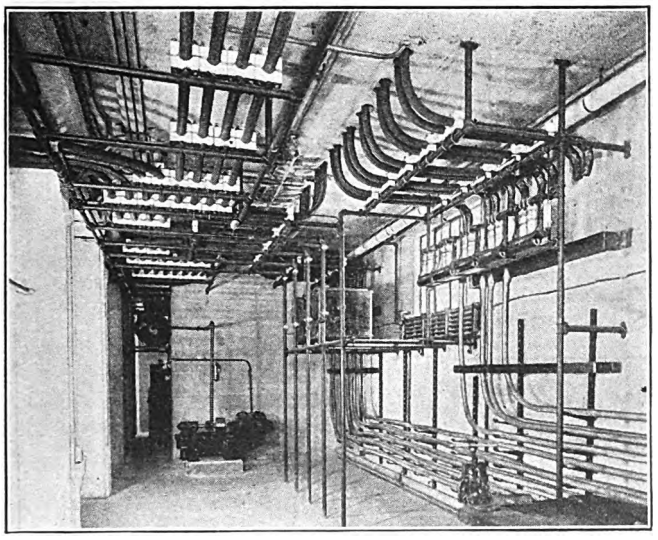
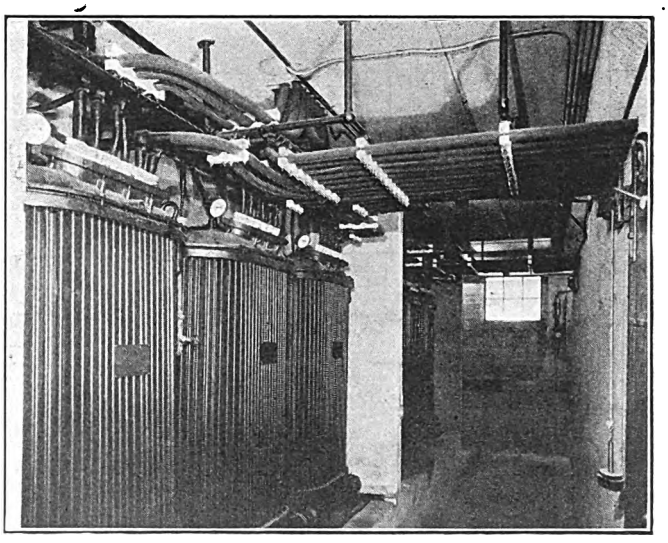


SPECIAL ATTENTION HAS BEEN GIVEN TO NEAT ARRANGEMENT OF D.C. CABLES IN THE MAIN BASEMENT



THE LOW-TENSION CABLES ARE RACKED OVERHEAD IN THE TRANSFORMER COMPARTMENT

of transformers located close by on the other side of the partition.

The transformer room is provided with a longitudinal track on which rolls a transfer truck for the transportation of a transformer to one end of the room, where it can be raised through a hatch by the main generator-room crane. The transformers are mounted on wheels and roll on cross-tracks to their respective places.

VARIED POWER REQUIREMENTS HARMONIZED ON THE SWITCHBOARDS

The main high-tension control switchboard contains the following panels: Four three-phase two-circuit incoming line and feeder panels, one three-phase two-circuit incoming line and bus tie panel, two three-phase two-circuit transformers and six-phase rotary panels, one three-phase two-circuit incoming line and bus tie panel, three three-phase two-circuit transformers and six-phase rotary panels, one three-phase two-circuit incoming line and feeder panel, and four six-phase rotary converter starting panels.

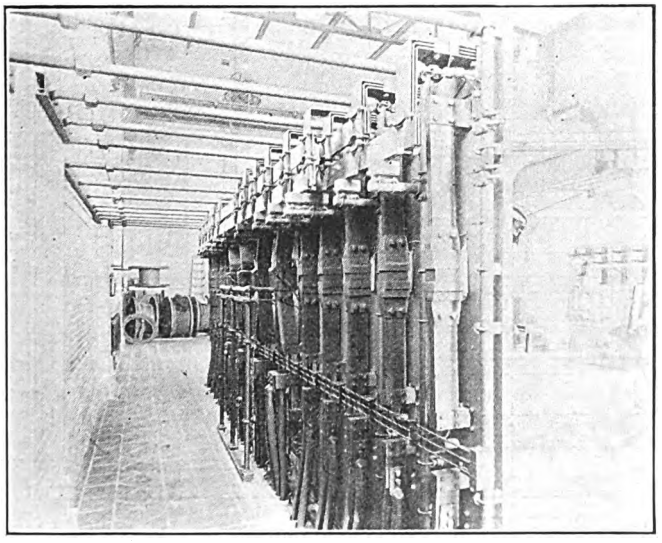
This high-tension switchboard controls five oil circuit breakers in incoming feeders from the Hochelaga power house and four oil circuit breakers for the incoming feeders from the central plant of the Montreal Light, Heat & Power Company, six oil circuit breakers for outgoing feeders to various stations of the Montreal Tramways, one oil circuit breaker for house service feeders, and four oil circuit breakers for the four banks of rotary converter transformers.

The incoming feeders are protected with reverse power relays, while the outgoing feeders and the rotary converter transformer circuits are protected by induction-type time-limit overload relays.

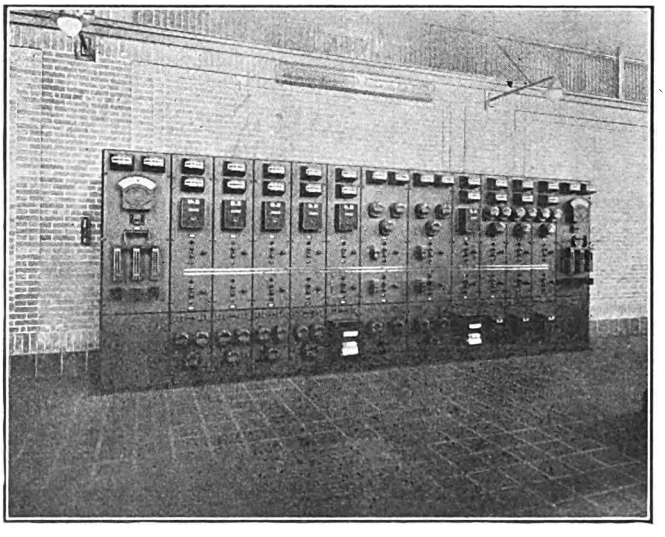
The rotary-converter transformer panels have an additional protection in a low-voltage release, which trips the high-tension oil circuit breaker and the rotary direct-current circuit breaker simultaneously, preventing a possible feed-back into the rotary and the direct-current system, which might cause overspeed.

To safeguard the rotaries against over-speed, they are, in addition, provided with speed-limit devices, and the rotary direct-current circuit breakers are provided with reverse-current relays.

This switchboard is equipped with mimic bus, showing at a glance the high-tension switching arrangement. All high-tension oil circuit breakers are remote-controlled, being of the familiar parallel-pot motor-operated type, excepting one oil circuit breaker controlling the house service, which is hand-operated.



ACCESSIBILITY IS A FEATURE OF THE DIRECT-CURRENT SWITCHBOARD



ON THE MAIN A.C. SWITCHBOARD A MINIATURE BUS REPRESENTS EACH ACTUAL BUS

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The direct-current railway switchboard consists of four rotary and ten feeder panels.

On the rotary panels are single-pole Reversite air circuit breakers, with overload shunt trip and bell-ringing attachments; ammeters, control switches for operating the remote-control equalizer air circuit breakers; field rheostat control handwheels; single-pole, quick-break knife switches; d.c. watt-hour meters; reactive volt-ampere indicators and two-point potential receptacles.

All feeder panels are equipped with plain overload 750-volt, 3,000-amp. air circuit breakers and the usual auxiliaries. The d.c. board is a single-polarity board, with all framework insulated from ground. The positive bus is mounted immediately behind the board and is of the "hollow" type for good radiation. All bus copper is painted black for the same purpose.

All Negative Switching Is Done in Basement

Taking up now the direct-current circuits, and referring to Fig. 6, it will be noted that the main basement is directly under the rotary room. It contains the remote-controlled equalizer circuit breaker panels, the negative switch panels, the negative bus, the equalizer bus and the general direct-current 600-volt cable layout.

The negative cables connecting to the negative bus are provided with shunts, making it possible to read the current of the individual negative cables.

They are also provided with pressure wires, so that it is possible to determine the drop in the cables from the point where they are tapped to the rail.

The positive cables are racked along one wall (the north wall) and leave the station through a duct entrance at the east end of the basement where they enter the municipal underground duct system.

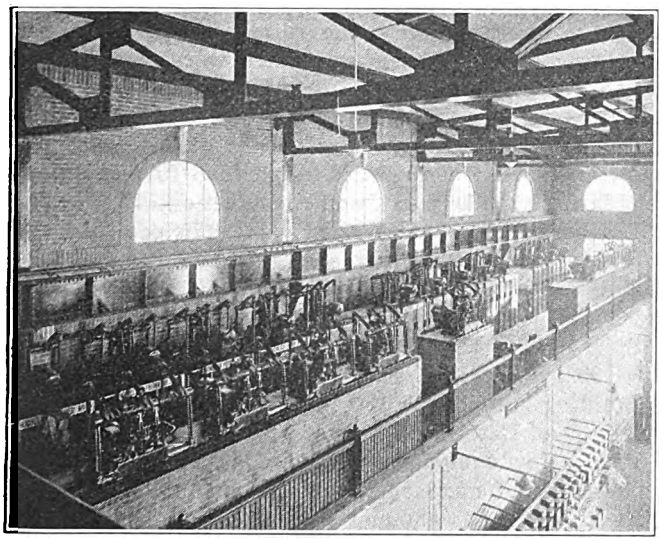
The arrangement of the equalizer remote-controlled air circuit breakers in the basement directly under the rotaries, and controlled from the direct-current rotary panels, gives the shortest possible equalizing connection between the rotaries and has the additional advantage of removing the breakers from the operating floor.

In all of the direct-current cable work between rotaries, switchboards and potheads on direct-current positive feeders, insulated cables with flameproof covering were used.

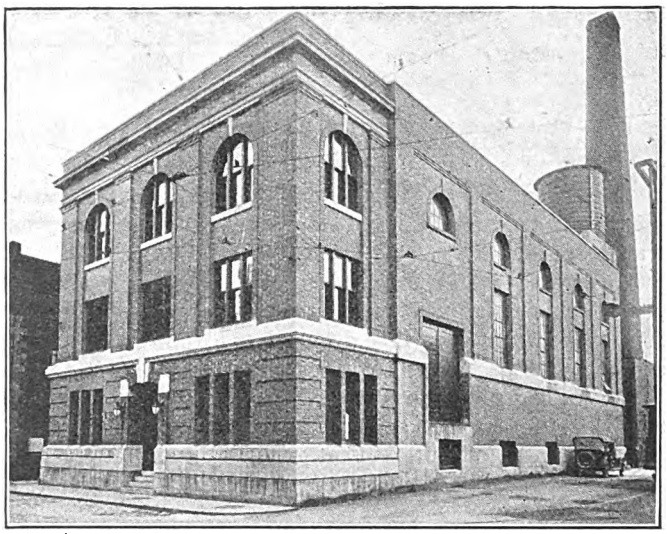
A part of the main basement is partitioned off as a battery room, to house the storage batteries used in connection with the remote-control switches, etc., and another small basement room is provided for the house service transformers.

Station House Service Is Liberal

The substation is well equipped with apparatus for house service. A bank of three 50-kva., single-phase, 60-cycle transformers lower the voltage from 12,100 to 2,200, and there is a bank of three 25-kva., single-phase 60-cycle transformers, which lower it further from 2,200 to 550 for miscellaneous power purposes about the station. Two 10-kva., single-phase transformers take power at 2,200 volts and deliver it at 220 or 110 volts for station lighting. Two 10-hp., three-phase, 550-volt induction motors drive centrifugal water pumps, and one three-phase, 550-volt induction motor drives an air compressor for service in blowing out electrical machinery in the plant. A 10-hp., three-phase, 550-volt induction motor direct-connected to a direct-current generator furnishes power for charging the 60-cell, 120-amp.-hr. storage battery.



A Birdseye View of the Circuit Breaker Gallery, A.C. Control Board Just Visible in Foreground



Montreal Tramways' Latest Substation Located on Cote Street

The house service switchboard from which the above equipment is controlled is located, as previously mentioned, at one end of the converter room, where it is directly over the house service transformer room.

Cote Street Station Is Latest Step in Local Power Distribution Development

In what has been said above, no attempt was made to catalog the various pieces of equipment which go to make up the station. As will have been noted, most of the apparatus is of standard types. The substation has been described in detail because it marks the latest in the evolution of substation design on the Montreal Tramways system.

From the architectural and structural standpoints, the building conforms with the tramways' standards. While the surroundings of the building were not such as to dictate special attention to appearance, the street front possesses the same architectural dignity as characterizes other recent substations of the company.

On account of the character of the ground on which the substation had to be placed, it was necessary to rest its foundation on piles. Of these more than 200 were used, reinforced concrete piles being selected on account

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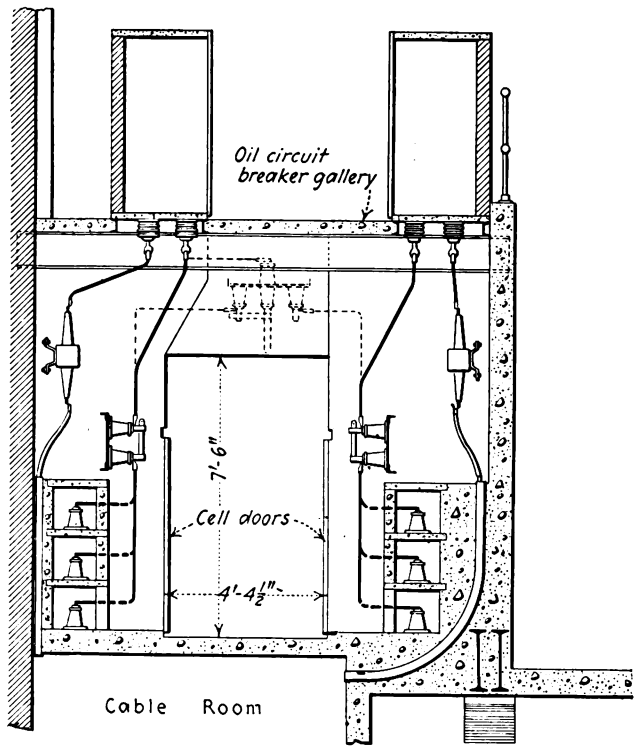

FIG. 5—CROSS-SECTION THROUGH BUS COMPARTMENT, SHOWING BUSBARS, DOUBLE-THROW TRANSFER SWITCH, ETC.

of their durability. To prevent leakage into the basement all concrete work below the surface line was waterproofed.

To provide water for cooling and other general purposes, an artesian well was drilled 1,005 ft. deep. From this water is pumped into a 13,000-gal. tank on the roof of the building.

The lighting of the station was given special attention, in the conviction that a well-lighted station is economical to operate. For general illumination two rows of 500-watt tungsten lamp fixtures were placed under the roof trusses and 100-watt lamps were hung on brackets around the walls of the rotary converter room. Throughout other parts of the building the lighting is on the same liberal scale.

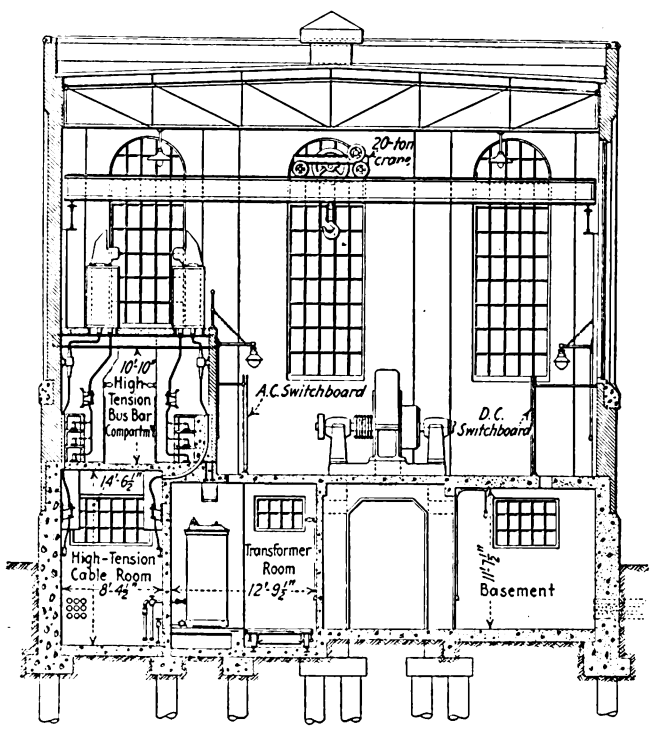

FIG. 6—CROSS-SECTION THROUGH PRINCIPAL ROOMS AND COMPARTMENTS OF SUBSTATION

The front of the building is occupied by offices already mentioned, and there is an additional office partitioned off from the main generating room for the load dispatcher. In this provision has been made for a private telephone exchange by means of which all the stations of the Montreal Tramways will be connected to the Cote Street substation by means of several private telephone lines.

In conclusion a word regarding costs will be in order. The total cost exclusive of site was about $779,000. Of this the building cost $191,000, the machinery and its installation $317,000 and the underground conduits and cables, with their installation, $271,000.

Internal Revenue Rules on Replacement

THE Internal Revenue Bureau has determined ratios of estimated post-war cost of replacement for use by taxpayers in computing claims for tentative allowance for amortization. The ratios are given in percentages based on the prices which were prevailing in June 30, 1916, as follows:

Ratios for computing estimated post-war cost of replacement of buildings, vessels, cars, tanks, blast furnaces, open-hearth furnaces, annealing furnaces, electric furnaces, coke ovens and construction of all kinds:

Lumber—hard, 240 per cent; soft, 175 per cent.

Structural steel, 60 per cent.

Building materials, other than lumber and structural steel, 225 per cent.

Steel (other than structural steel), and steel products, 90 per cent.

Building equipment, 150 per cent.

Labor, all classes, 160 per cent.

Ratios for computing estimated post-war costs of replacement of machinery and equipment:

Electrical machinery and equipment, 130 per cent.

Engines, turbines, compressors and similar facilities, 175 per cent.

Pumps, 135 per cent.

Boilers, 160 per cent.

Transmission equipment—shafting, pulleys, hangers, etc., 135 per cent; belting, 100 per cent.

Machine tools and small tools (machine tools are considered as that class of metal working machinery which can be used on both cast iron and steel), 130 per cent.

Woodworking machinery, 155 per cent.

Textile machinery, 155 per cent.

All other machinery, including cranes: machinery the cost of which did not exceed 10 cents per pound as of June 30, 1916, 120 per cent; machinery the cost of which did exceed 10 cents per pound as of June 30, 1916, 130 per cent.

Office furniture and equipment, 125 per cent.

Last month the Berlin Elevated Railway completed its first twenty-five years of service. Operation was begun April 13, 1897. To commemorate its twenty-fifth birthday the company has published a small but attractively illustrated pamphlet giving views of various stations and other interesting points along the line, with a map of the system.

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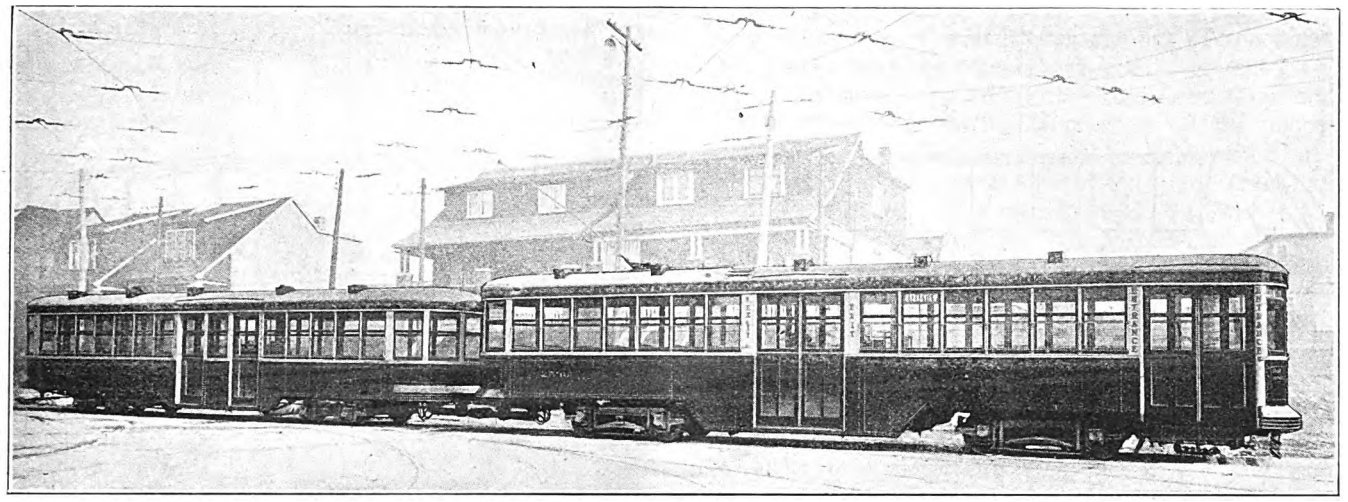


MOTOR CAR AND TRAILER TRAINS ARE PART OF NEW TORONTO EQUIPMENT

Toronto's Progressive Rolling Stock

The Toronto Transportation Commission Has Added 250 New Cars to Its Passenger Rolling Stock and Has Remodeled More than 350 Other Cars

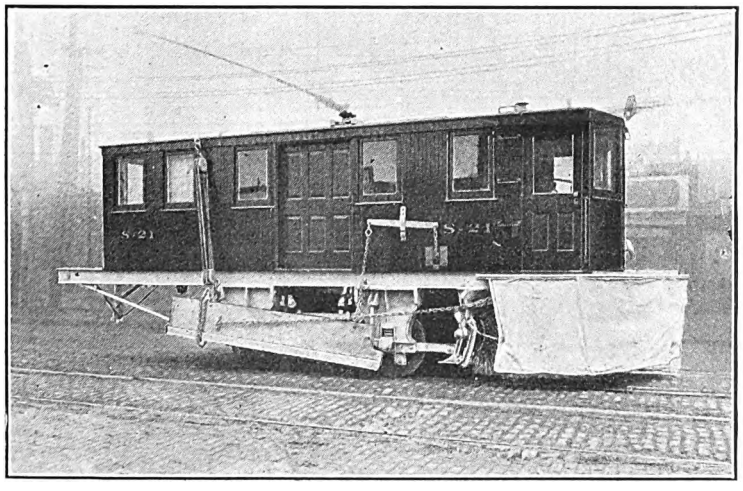
SINCE the Toronto Transportation Commission took over the operation of the lines formerly operated by the Toronto Railway Company, Sept. 1 last, it has received 190 new steel frame double-truck P.A.Y.P. type of motor cars and also sixty steel frame center-entrance double-door trailers. Bids have recently been requested for an additional 100 motor cars and 100 trailers. As yet the order for their construction has not been placed. Of the cars now in service, 140 motor cars and all of the trailers were built by the Canadian Car & Foundry Company. The Canadian Brill Company built fifty motor cars at its Preston works.

The motor cars seat fifty-eight and weigh 49,000 lb. approximately. The general dimensions and seating arrangement are shown in the accompanying illustrations. The trailers seat sixty-one and weigh 28,000 lb.

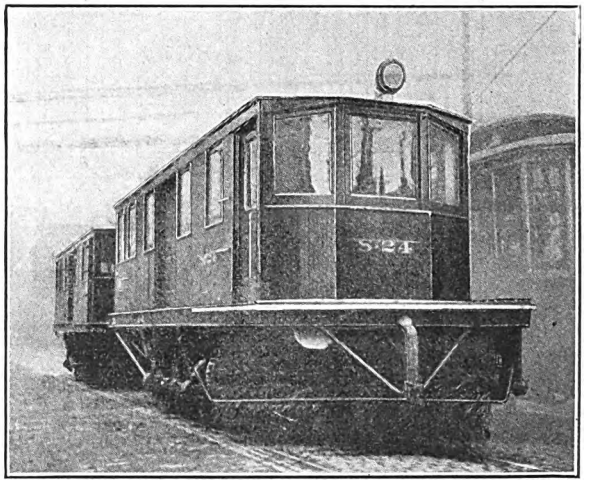
In the construction of the Canadian Car & Foundry Company cars steel center sills run the full length of the car bodies and the other members of the underframe are also of steel. The cars are provided with double floors, the lower floor being of 1-in. tongued and grooved white pine. The upper flooring is of ⅜-in. hard wood and between the two floors is a liberal coating of heavy lead and felt paper. Floor strips ½ in. x 1 in. are laid in the aisle between the cross seats. The trucks are Canadian Car & Foundry Company design with 4½ in. axles. The wheels used on the motor cars are 30-in. C.I and those on the trailers 22-in. C.I. Of the 140 motor cars built by the Canadian Car & Foundry Company, 100 are equipped with Westinghouse 533 T 4 motors, four motors per car. Forty are equipped with D K 83-A English Electric Company's motors. The cars equipped with English Electric Company motors have Q-2 form G controllers with a line switch contact. All motor and trail cars are built for single end operation.

The fifty cars built by the Brill Company are equipped with Canadian General Electric 241 B interpole ventilated 50-hp. motors and K 35 X A controllers with ratchet switch and General Electric line breakers type DB 976-A-7. Cincinnati Tool Steel Gear & Pinion Company's helical gears and pinions are used on all motor cars except those having Westinghouse motors. These are equipped with Nuttall helical gearing.

The English Electric Company's equipment consists



SWEEPER FITTED WITH SIDE WING



SWEEPERS IN YARD READY FOR SERVICE

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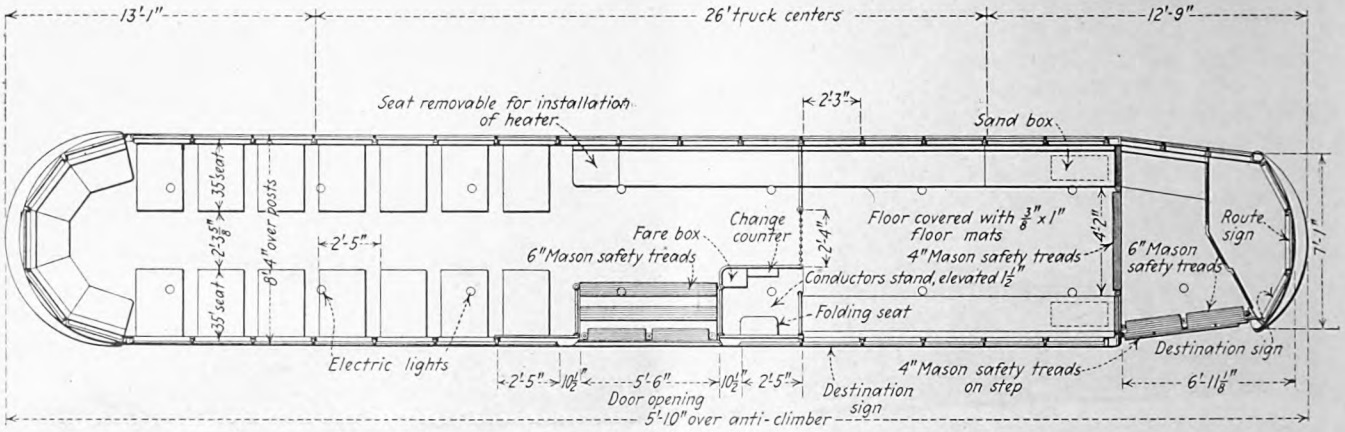
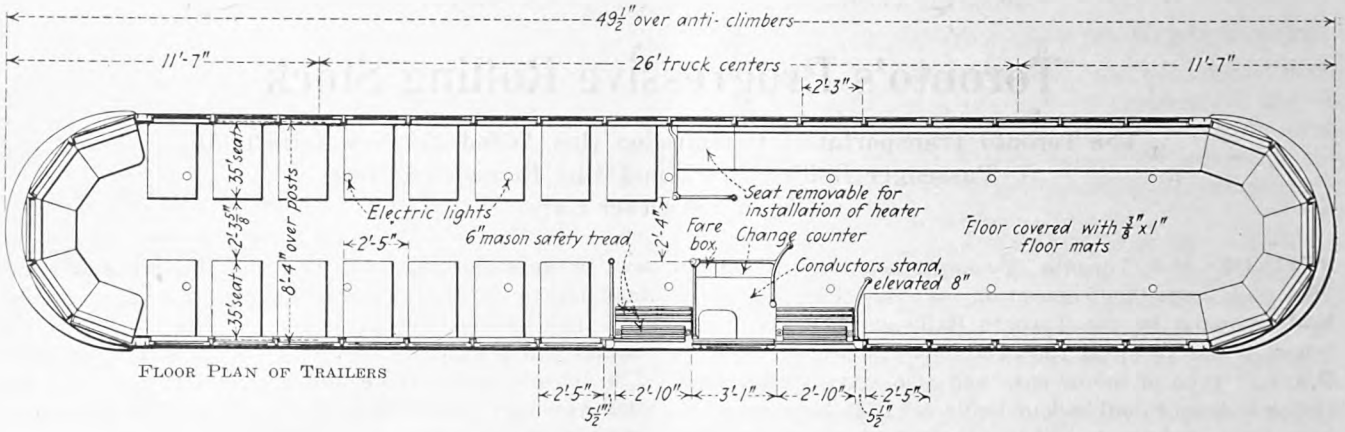
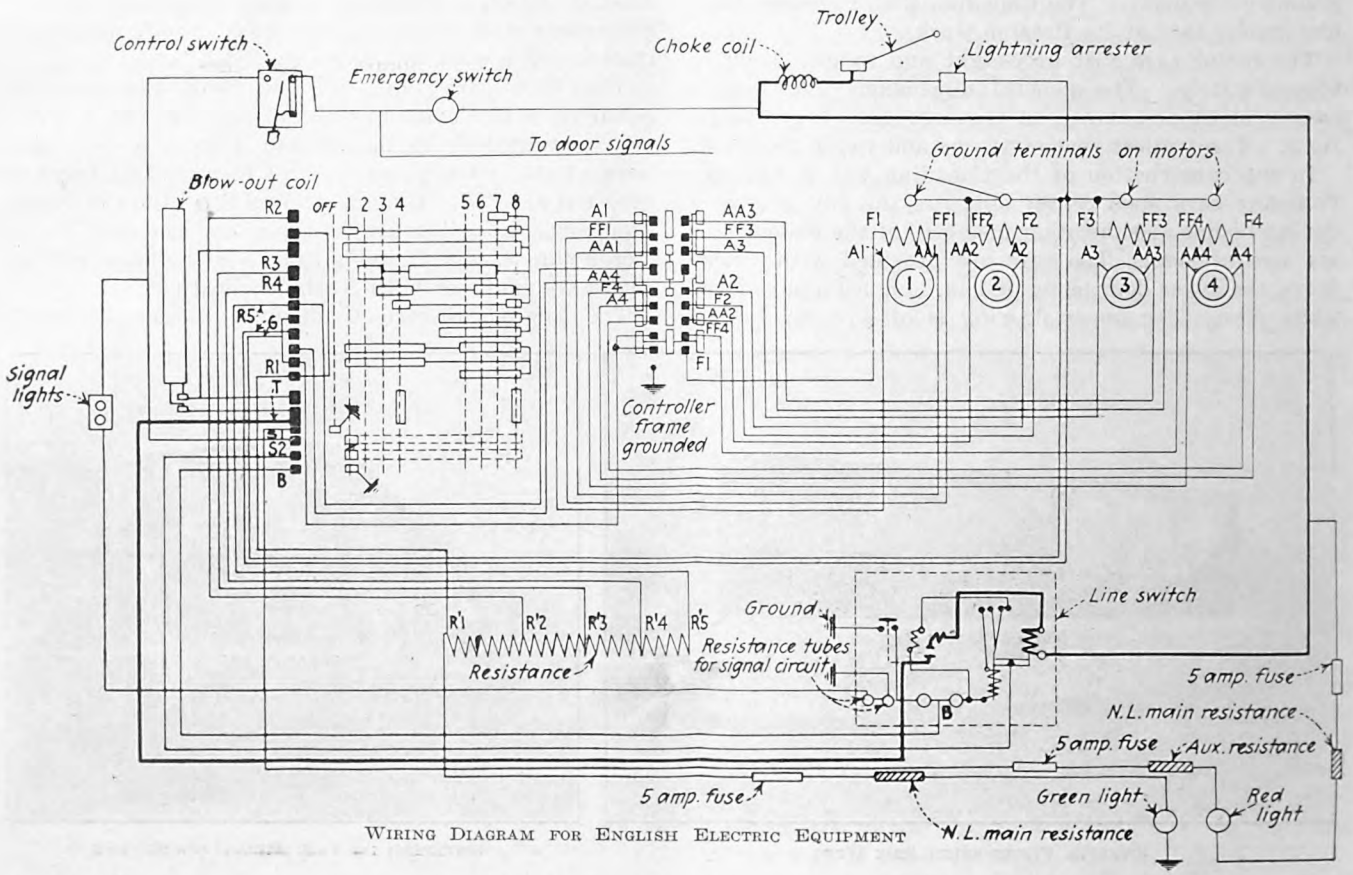


FLOOR PLAN OF MOTOR CAR



FLOOR PLAN OF TRAILERS

Floor Plans of Motor and Trail Cars and Control Diagram Used in Toronto



WIRING DIAGRAM FOR ENGLISH ELECTRIC EQUIPMENT

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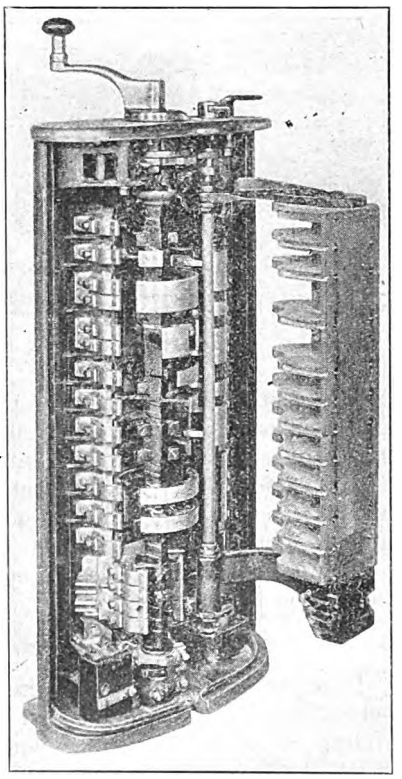
of four D.K.83-A, 55-hp., 600-volt, 640 r.p.m., series interpole, ventilated motors per car, one type "Q-2" form G controller, with magnetic shield blowout and slip ring switch, and one type H form Q resistance, consisting of six eleven-grid boxes for suspension under the car. The motors, which are of the four-pole series interpole type, are self-ventilated by a fan mounted on the armature shaft at the pinion end. This produces a dual flow of air through the machine, one current passing through the armature core and the other along the surface of the armature and through the field coils, thereby securing a very considerable reduction in the ultimate temperature rise. The frame is of the box type, the motor leads being brought out on the suspension bar side, the two armature leads at the commutator end and the two field leads at the pinion end. This arrangement proves very advantageous for double-truck cars. Among other desirable features to be found in the motor is the type of brush-holder, which is provided with a serrated clamping face, thereby securing rigidity and making it quite impossible for the holder to slip down onto the commutator. The interpole and main field coils are secured against movement by the insertion of a flat spring between the coil and the frame. The coil is protected from the spring by a light steel tray. The motor is designed in such a way that it is possible to drop it straight out of the truck without disturbing the wheels and axle.



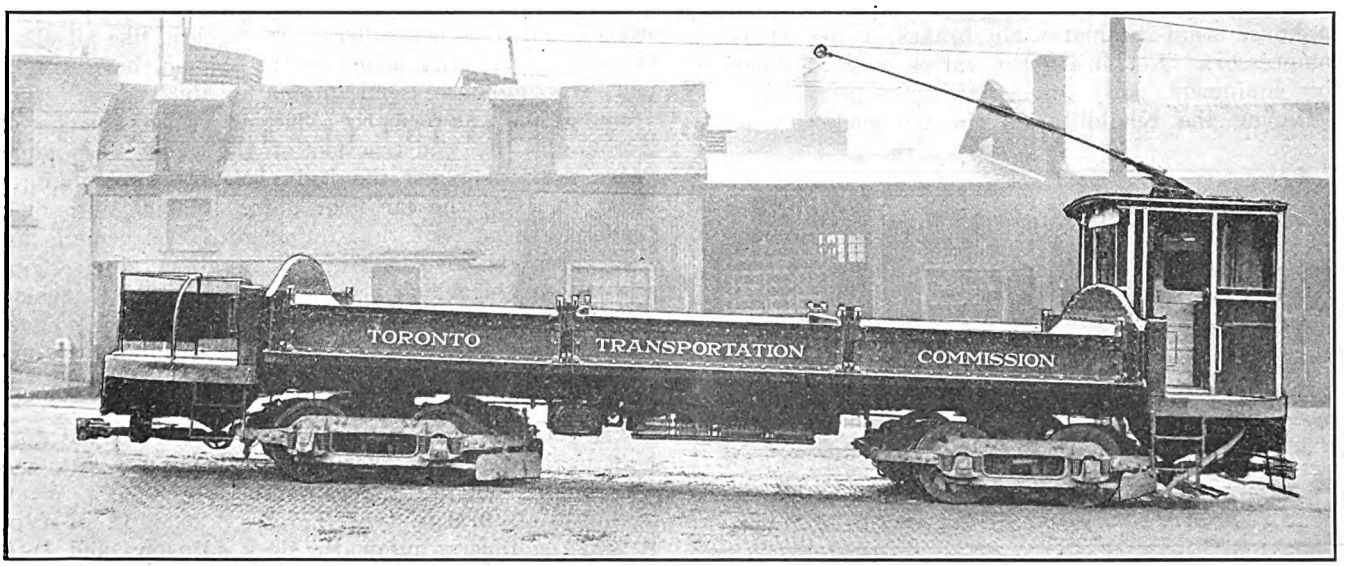
CONTROLLER WITH MAGNETIC SHIELD BLOWOUT, TYPE Q-2 FORM G

The gears were supplied by the Tool Steel Gear and Pinion Company of Cincinnati and are of the helical type, having a 7½-deg. angle. The gear cases are of the pressed steel type, are practically free from any riveting or welding and weigh complete 90 lb.

The controllers are for use with a four-motor equipment and are supplied with the "Zweigbergk" magnetic shield blowout coil to take care of any arcing that may possibly take place. The main power circuit is protected by a line switch with suitable overload devices, which is placed under the car, and the operation of this switch is provided for in a slip ring contact placed in the base of the controller.

The method of motor cut-out is new to the American continent and is taken care of by a crank projecting outside the back of the controller. This crank is moved by using the reverse key, which is not removable unless the controller is in the "off" position, and an upward movement of the crank lowers the controller reverse drum and cuts out Nos. 1 and 3 motors, and inversely a downward movement cuts out Nos. 2 and 4. The motors cut out are shown on a dial plate. This method, of course, obviates the necessity of opening up the controller with consequent time lost and possible risk of burning and electric shock; also, when the motors are cut out the controller is designed to give the full series-parallel effect, virtually making the car into a two-machine unit.

In contrast to the usual practice with the four-motor controllers, four series and four parallel steps are provided, the even acceleration being provided for in the grading of the resistance, which is divided into five steps. The blowout coil is short circuited on the fourth and eighth notches, these being the two running positions where the blowout coil has no useful work to do. The controllers supplied on this particular contract are not fitted with any notching device on the main power drum, any excessive motor currents being provided for in the main line switch, but it is of interest to note that this feature can be quickly and easily fitted by making a slight addition to the power drum star wheel and the power drum handle, and when provided it is impossible to move the power drum through the eight notches in less than four seconds.



TYPE OF DUMP CAR RECENTLY ADDED TO EQUIPMENT

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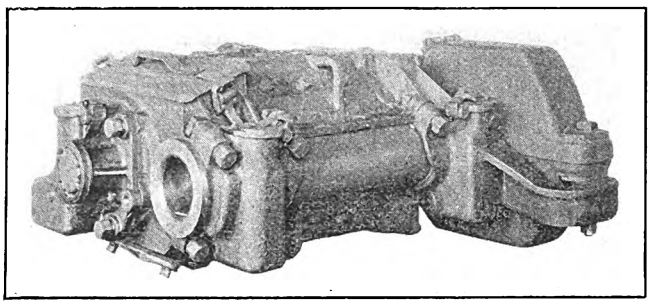
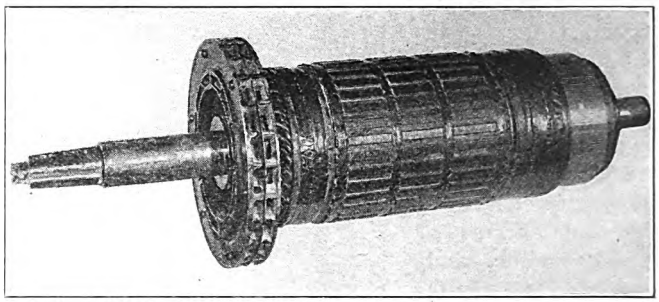


SERIES INTERPOLE VENTILATED MOTOR TYPE D K 83-A



ARMATURE FOR D K 83-A MOTOR

The resistance is of the "under-the-car" type and consists of six boxes, each box having eleven cast-iron grids. All grids are of the same pattern, thus reducing the number of different sizes of spares that must of necessity be stocked.

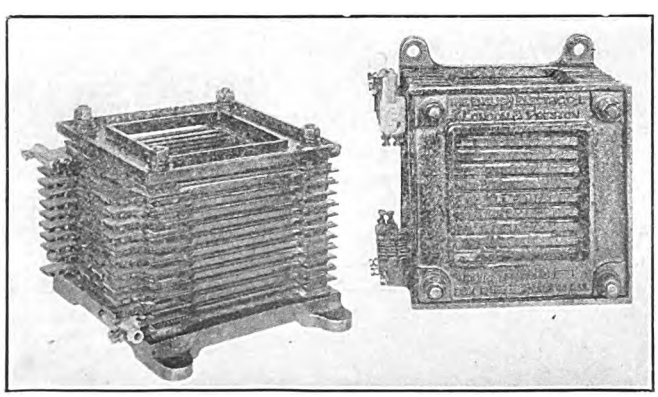
The door control and safety features of the National Pneumatic Company, which have been so widely adopted by a number of the larger electric railways in the United States, are installed on these cars and have proved of great advantage in operation.

Both motor cars and trailers are provided with Nichols Lintern indicating tail lights. A green light indication is given whenever power is being applied to the motors and a red light indication when coasting or braking operations are taking place or when the car is not moving. The red light receives its ground through a controller contact in the off position with both the English Electric Company and General Electric Company's equipment, but on the Westinghouse equipments the red light is grounded on the No. 4 armature lead. Tomlinson automatic air and electric couplers are used. Other equipment includes Peter Smith heaters type 2-P.O., which obtain air through the side of the car; Electric Service Supplies Company route and destination signs; Ohio Brass Company's headlights; air sanders; and drum switch for light connections between motor and trail cars; 140 sets Earll No. 10 catchers; H. B. life guards, and all motor cars have Nuttall U. S. 13 D trolley stands.

CAR REHABILITATION

Last winter 350 double-truck prepayment type cars were completely rehabilitated and the Maggan storage air brake system was removed and replaced by Westinghouse semi-automatic air brakes, using D H 16 compressors. K-1 emergency valves were also part of this equipment.

During the rehabilitation the old coal stoves formerly located in the center of the front end inside the bulkhead were removed and Peter Smith heaters of the same capacity as in the new cars were installed on the front platforms. With this rehabilitated rolling stock and the new motor cars and trailers, the company is able to put out on the street for rush-hour purposes a considerably better class of equipment than has ever been used in the city.



GRID RESISTOR FRAMES, TYPE H, FORM Q

SERVICE EQUIPMENT

In order to carry out the extensive program of track rehabilitation the commission has added additional rolling stock to its service equipment. Three differential dump cars with three pockets each and two crane cars for hauling and placing of rail and special work were added and eight additional differential dump cars have just been delivered. The differential dumping cars are mounted on Curtis D 2 trucks taken from old passenger cars and the work of mounting the bodies on them was done in the car shops. These cars are single-end equipments and have K 35 controllers, T.T.C. resistances and Westinghouse D H compressors and 4 G.E. 80 motors. They are also equipped with Tomlinson couplers and air-sanding apparatus.

The tilting body is divided into three compartments, each with its own side doors, so that different kinds of material may be hauled at the same time. The contents of the compartments, or a part of each compartment, may be discharged at different points, or the entire load discharged automatically at once. The material may be distributed along the track as desired by opening one door at a time and tilting the body gradually.

The crane cars previously mentioned are mounted on Diamond A frame trucks and also have 4 G.E. 80 motors and K 35 controllers. These cars, like all other motor cars recently added to the system, have single-end Westinghouse semi-automatic air brakes. The frame of one was formerly a flat car used by the city of Toronto in the construction of the Civic lines some years previously and the body bolsters were changed so as to lower the car floor 6 in. Watson automatic fenders are part of the equipment. The commission has purchased five McGuire Cummings single-truck snow sweepers, which are equipped with T.T.C. resistances, G.E. 80 motors and K controllers. These sweepers are provided with wings for leveling the snow which is thrown up by the sweepers alongside the tracks.

The commission has also had five steel-frame flat cars built in these shops. These cars are equipped with K-6 controllers, G.E. 80 motors, T.T.C. resistances, Westinghouse air brakes, type S.M.E.; 8 in. x 12 in. type S brake cylinders, automatic slack adjusters and D H 16 compressors.

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Four Months of Right-Hand Operation

A Review of the Effects of Changing the Rule of the Road from Left to Right-Hand Operation on the British Columbia Electric Railway

BY W. G. MURRIN
Assistant General Manager British Columbia Electric Railway, Vancouver, B. C.

IN AN article which appeared in the ELECTRIC RAILWAY JOURNAL of Nov. 19, 1921, page 894, I gave an outline of the problems which confronted my company in regard to the change of the rule of the road from left to right-hand operation in accordance with the highway act, amendment act of 1920, of British Columbia.

Below I give a short résumé of the procedure in actually making this change, of the progress to date toward completing the work and of accident record, in so far as the company is concerned, during the first four months of right-hand operation.

A day or two previous to Dec. 31, 1921 (Jan. 1, 1922, at 6 a.m. being date and time set for change), practically all city cars had passed through our Vancouver shops, where changes, alterations and additions such as installation of temporary steps on right-hand rear side of cars, cutting an opening in right-hand rear end for entrance and exit purposes, installation of right front-end exit door and steps, etc., had to be made. As each car came into the carhouse on the night of Dec. 31 or early the next morning the right-hand rear and side were removed and the gates on the rear left-hand side were made fast. The front exit door on the left-hand side of the car was made fast and the temporarily installed right-hand front door was released for operation. This door for some time following Jan. 1 was not mechanically operated.

By 10 a.m. Jan. 1 all cars had received attention and were made suitable for operating temporarily. The car service on New Year's Day was affected but slightly by the change-over, and on the following days the regular services were maintained.

As all cars had by this time been temporarily changed over, our next step was to board up temporarily the opening on the left-hand rear end of the cars for protection of passengers and conductors from the elements, the weather at this time being particularly cold. This was accomplished by fitting in the temporary side removed from the right rear end of the car. This job finished, the installation of mechanically operated gates was next taken in hand. This in itself was a big undertaking. This work, together with installing mechanism to operate the front exit door by the motorman, has recently been completed and our attention is now being directed to the removal of the front vestibule bulkheads and the reinstallation of one with a door from the main body of car into the vestibule on the right-hand side of car. At present passengers leave the main body of the car by the door on the left-hand side of the front bulkhead, pass behind the motorman, and leave by the door on the right of car. For the vestibule changes which are now being made it is necessary completely to remove the present bulkhead, change the location of certain uprights and car wiring and reinstall a new partition. It will readily be seen that with twenty different types of cars in operation a tremendous amount of work is involved in this change and I estimate it will take a number of months to complete this portion of the work.

All the change-over work to date has been carried out without interference with the maintenance of our regular car service and in completing the work this factor is not being overlooked.

The accompanying table will indicate the effect the change-over from left to right-hand operation has had in respect to certain classes of accidents as compared with the same four months in the two preceding years.

ACCIDENT DATA—BRITISH COLUMBIA ELECTRIC RAILWAY, JANUARY-APRIL

	Passengers	1920	1921	1922
1	Boarding and alighting	62	78	129
2	Due to operation of car	103	38	38
	Collisions			
3	With pedestrians	25	26	47
4	With autos	253	213	231
5	With rigs	33	14	20
6	With street cars	16	9	11
	Totals	492	378	476

Of the figures in the table only those items numbered 1 and 3, for 1922, appear to require an explanation from me. Boarding and alighting accidents, numbered 1 in the above statement, for 1922 show a decided increase over the two preceding years and this is directly attributable to the cars operating during the greater portion of the four-month period in question, Jan. 1 to April 30, without rear entrance and exit gates. Now that all cars are equipped, a decided decline in number of accidents of this class is noticeable.

Accidents to pedestrians, numbered 3 in the table, are not so serious as at first glance they might appear. While the number of accidents in this period for 1922 shows a decided increase over same period for 1920 and 1921, not one of the forty-seven accidents was of a serious nature. All were more or less trivial and the increase can be attributed directly to the rule-of-the-road change.

We anticipated the possibility of the occurrence of serious accidents following the change-over and, with a view to offsetting this exigency, an elaborate advertising campaign covering various angles regarding the change to be made was carried on by my company for some weeks preceding Jan. 1, 1922, and there is no question in my mind but that this campaign accomplished its purpose and resulted in the extremely low accident record shown herein.

Saving a Second on Each Stop

IN A RECENT address given by him at the Institute of Transport, London, J. K. Bruce, traffic manager of the London County Council Tramways, referred to the saving on the London County Council Tramway system of one second at every stop. He declares that this would represent a total saving each day of 220 hours. This saving would enable approximately 2,000 additional car-miles to be run each day, without increase in the number of operators or number of cars. Put in another way, the same number of car-miles could be run each day with seventeen fewer cars. A saving of seventeen cars at £2,000 a year each would mean a reduction in operation cost of £34,000 a year. In addition to this saving to the owners of the tramway system there would be a very important saving to the traveling public as well as a reduction in street congestion.

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Pertinent Points from the N.E.L.A. Convention

Happenings of Interest to Electric Railway Men Included Reports on Public Relations, Budget Control, Customer Ownership and Prime Movers—Operating Figures on Milwaukee Powdered Coal Station Presented

THE National Electric Light Association held its forty-fifth convention at Atlantic City from May 15 to May 19 inclusive. The convention was one of the best attended the association has ever had, there being a registration well in excess of 3,000. Throughout the whole convention there was a note of optimism, which apeared to be of fundamental soundness and not of mere Atlantic City manufacture.

There was a general feeling, concretely expressed by President M. R. Bump in his presidential address, that utilities can look forward confidently to a broad investment market which would justify proceeding with plans for necessary extension and rehabilitation.

This sentiment was also reflected by Carl D. Jackson, who spoke on "Some Post-War Problems of the Utilities." His address will be presented in abstract in an early issue.

Invested Insurance Funds Represent Public Ownership

Haley Fiske of the Metropolitan Life Insurance Company told of the large amount of public utility securities in which the people of the country who are saving their money in life insurance companies have a direct interest through the investment of these funds in such securities. Of the total insurance activities in the country—some 79,000,000 or more policies, representing probably policies on more than 50,000,000 lives—he pointed out that this meant that half of the people in the United States must be directly interested in the investment of funds in the utilities. In this way the public of the United States actually does own the utilities of the country, and this fact should be brought home very clearly to the public through publicity and educational work.

On the other hand, Mr. Fiske pointed out that the reason these securities were good investment for the funds made up of the savings of the public as a whole was that the officials of the insurance companies who had the responsibility of investing these funds expected good conservative management from the utilities. This meant that the funds would be safely invested and build up that reserve which is necessary to take care of the paying of obligations when life insurance benefits become due.

Mr. Fiske's address, as well as that of Mr. Jackson, was ordered printed and distributed to the membership of the N.E.L.A.

Secretary Hoover

It had been expected that Secretary Hoover would be present, but, on account of the emergency situation in the coal strike, he was detained in Washington. He did address the convention, however, by long-distance, loud-speaking telephone on Friday morning and expressed regret at his inability to be present. He stated his firm belief in the establishment of super-power systems for the production of electrical energy. Mr. Hoover said he was detained in Washington because of the urgency of the coal situation, but he felt that he had served the electrical industry better there than he would have served it had he attended the meeting.

Attorney-General Daugherty

Also unable to be present at the convention, although he had planned to do so, was Attorney-General Henry M. Daugherty. He was represented by an Assistant Attorney-General, Judge Holland, who presented Mr. Daugherty's address. The Attorney-General came out strongly against government ownership of any kind and said: "Regardless of class, color or means, more money belonging to the people is invested in utilities than in anything else. This is the character of public ownership, I am frank to say, of which I am in favor. I am not in favor of political form of governmental or municipal ownership. The electric light and power companies of the country are publicly owned, for they have more than 1,600,000 security holders among the citizens of this country. That is true public ownership, with the incentive of private development, investment and management, under sane public regulation, and it is preferable to political ownership and political management, which always follow where the municipality or the government owns the public utility."

Public Relations Most Important

Martin J. Insull of Chicago, chairman of the Public Relations Section, in reviewing the year's work of the section, stated that as between finance and public relations he is of the opinion that the latter is the more important in the public utility business, because people with money to invest are not attracted to a business to which the public is antagonistic. He said that it cannot be impressed too strongly on executives that the education of employees in the fundamental economics of the business is a very important part of their duty not only to their individual company but to the industry. Mr. Insull continued: "Public relations as an association activity has only had a distinct place for the past few years, therefore the surface has only been scratched, but the results so far obtained do indicate the great possibilities of this work in placing the industry in its proper position in the public mind."

Budget Control as Aid to Management

In a paper on "Budget Control" Louis F. Musil, treasurer of the Cities Service Company, New York, pointed out that "the budget is too often used only to act as a check on dollars, and because of that reason its administration in many cases has been passed to that man or group of men who were able to check dollars very well, but on whom no recognized responsibility is vested for concurrence in or initiation of policies or programs which make it necessary for the dollars to be checked." Mr. Musil argued for budget procedure not only as a means of economical expenditure, both of operating and capital funds, but also as a means of developing executives and as a means for existing executives to select those men who show executive ability as they plan work ahead on a budgeting scheme. Mr. Musil presented six fundamentals which he said should be incorporated in any budgeting system.

These are:

1. The executive must recognize that his function is to create and enforce policies rather than to work out the problems resulting from such policies. If the expected results of policies laid down are predicted and mutually accepted, there will be little question in determining their merit or in determining the changes that may be necessary.

2. The executive must have knowledge of the control which is exercised by every individual in his organization to whom he subdivides responsibility. He must give evidence as to his knowledge of that control or the lack of that control and reward all individuals accordingly.

3. Individual merit can better be gaged by comparing a man's results with an accepted estimate by him of his future performance than by comparing his results with the results of some other individual.

4. It is therefore necessary for each individual in the order of his responsibility to recognize the necessity of adopting some common system of estimating the possibilities ahead of him.

5. Each individual must recognize the necessity of making his own estimate of what he is going to do and how he is going to do it before he or his associates or his executives can concede his

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qualifications or expect a full measure of results.

6. Each individual must further recognize that, through such a system, by the constant comparison of results with expectations, the leaks resulting from human omission and human judgment can most effectively be minimized.

SAVINGS BANKS AND CUSTOMER OWNERSHIP

M. S. Sloan, chairman of the committee on relations with savings banks, reported that already twelve states permitted investment of savings or trust funds in utility securities and the effort now is to obtain similar action in other states. Mr. Sloan presented statistics which showed the advantage of public utility investment for this purpose and indicated that these statistics were being presented in various states.

John F. Gilchrist, as chairman of the committee on customer ownership, made a very strong report urging continued and greater activity in this line. The committee has definitely concluded that customer ownership is not to be looked upon as a war measure destined to fade out with the return of normal conditions, but from a financing standpoint alone will become more and more important each year in the future.

The committee indicated that more than 200 electric light companies are engaged in the sale of securities to customers, and, from the eighty-four reporting, it showed that approximately 570,000 shares had been sold during the year. The ratio of total stockholders to total customers for all of the companies is 1 to 17. The average purchase for all companies is about seven shares per stockholder. The selling cost per share was as high as $9 in one instance, but the average for the thirty-five companies was $4.30. One large company was able to reduce its selling cost to $1 per share in the last year. Other companies got down as low as 94 cents and 70 cents.

W. S. Murray, who in a recent report had shown the high actual cost of government-owned utility service in Ontario, was called upon by the Hamilton (Ont.) *Spectator* to retract his statement. Mr. Murray said he had nothing to add to or subtract from the conclusion he sent through.

PUBLIC POLICY COMMITTEE SUPPORTS COMMISSION REGULATION

The public policy committee, S. Z. Mitchell, Electric Bond & Share Company, chairman, reported on general policies of the association and of the industry. "As an industry, it has been our fixed policy to co-operate with the various public utility commissions to the end that regulation should be established on such a sound and equitable basis as to commend itself alike to the utilities and the public whom they serve." While recognizing the fairness of the commission to the electrical industry as a general proposition, the committee realizes that commission control is still in a developmental stage, and says: "We should therefore in this formative period of regulations help evolve a system as perfect as possible."

The public policy committee also gave strong support to the work of the various state bureaus of public information and credited these bureaus with having accomplished a real change in the attitude toward public utilities in those states where they have worked.

INDUCTIVE INTERFERENCE AGREEMENT

One of the outstanding features of the convention was the discussion on inductive interference, on which subject after considerable work the National Electric Light Association, representing the central-station industry, and the Bell Telephone Company, representing the telephone industry, have agreed upon a basis of co-operation to eliminate inductive interference difficulties in the future in so far as practicable. These inductive interference principles have been published as a special pamphlet and may be secured from either the National Electric Light Association headquarters or the American Telephone & Telegraph Company.

VALUABLE PRIME MOVERS REPORT

As usual, the prime movers report attracted great attention. This report is a book in itself, and presents data and analysis on the performance of a large number of large turbines. Experience with Diesel engines, powdered fuel and oil fired boiler plants also is included as a part of the year's work. Other information contained is that regarding improvement in turbine details, maintaining heat balance, tendency in steam pressures and superheat, prevention of clinker adhesion, water softening and lubrication. In general, the committee points out that station equipment has become virtually standardized except in details.

In the discussion on this report, one thing of interest was the statement by Mr. Anderson of the Milwaukee Electric Railway & Light Company with reference to the experience with powdered fuel in that company's Lakeside Station. A description of this plant was given in the April 15 issue of ELECTRIC RAILWAY JOURNAL, page 633.

Mr. Anderson said that if members are willing to accept the fact which he presented, they would no longer question the advisability of installing powdered fuel. The plant has been operating for fourteen months, one-half the time with one 20,000-kw. unit installed and the remainder of the time with 40,000-kw. in equipment installed. During that time 200,000,000 kw.-hr. has been generated without interruptions. Since operating conditions have not been adjusted to the point where the guaranteed turbine water rate has been obtained, and since continuous fuel composition has not been obtained, the most favorable economy and operating results have not been secured so far. Nevertheless, with coal varying from 9,000 to 13,500 B.t.u. and 15 per cent ash, and with a night load only 30 per cent of the day load, the following results have been obtained. Station water rate, 12.7 lb. per kilowatt-hour; steam for auxiliaries (allowing for banking of boilers), 2.4 per cent; boiler efficiency, 84.2 to 85.9 per cent (during steaming periods); over-all plant efficiency, 83.2 to 84.48 per cent; B.t.u. per kilowatt-hour (net), 19,097, and thermal efficiency (net), 17.88 per cent. When more normal conditions are obtained, Mr. Anderson feels confident that a thermal efficiency of 19.2 per cent and a boiler and economizer efficiency of 88 per cent will be obtained. From the tests which have been made he has come to the conclusion that the coal must be dried to contain not more than 7 or 8 per cent moisture, since anything in excess of this amount will cause irregular feeding of the fuel and increase the cost of conveying it. With a unit coal costing $28.78 per 1,000,000 B.t.u. and a unit labor cost of 62.5 cents per man-hour, a total operating expense of 0.5053 cent per kilowatt-hour has been obtained. These figures also can be improved, he declared, when operating conditions become more normal.

Since it was necessary to do considerable pioneering in constructing this plant, it cost more than one should cost now that more experience is available. Mr. Anderson declared that if a plant were construeted now it could probably be built for 10 per cent less than the Lakeside plant. Answering some comments which have been raised regarding trouble with ash issuing from smokestacks of powdered-fuel installations, Mr. Anderson pointed out that 70 per cent of the ash is being removed at Lakeside before it enters the stacks by utilizing washers in the breeching back of the boilers.

The electrical apparatus committee devoted most of its attention to breaker rating and to the automatic substation. This report pointed out that in the central station field the high cost of control equipment operated against the installation of automatic direct-current substations, but that the automatic alternating-current transformer station was coming into wide use.

The accountants showed great interest in the development of budgeting to include construction, operation, materials and supplies and cash requirements from the dual angles of forecast and control.

The American Electric Railway Association was represented at the convention by Executive Secretary J. W. Welsh, by the Director of the Advertising Section, Labert St. Clair, and by the chairman of the exhibit committee of the October, 1922, convention, E. J. Blair of Chicago.

OFFICERS ELECTED

Officers elected for the ensuing year in the N. E. L. A. include Frank W. Smith, vice-president of the United Electric Light & Power Company, New

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York, as president of the association, and Walter H. Johnson, Philadelphia; Franklin A. Griffith, Portland, Ore.; J. E. Davidson, Omaha, and R. F. Pack, Minneapolis, as vice-presidents.

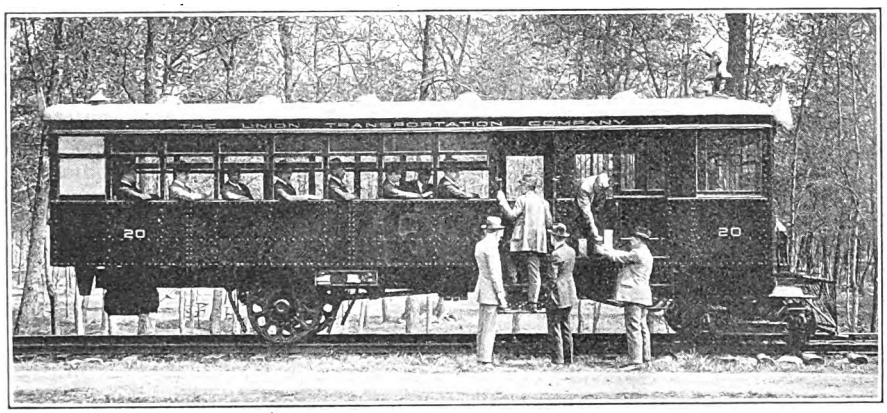
Gasoline Rail Car at Short-Line Convention

This New Type of Car Has Body Extending Over the Engine and Only One Speed Reverse

RAILROAD officials were given the opportunity a few days ago of inspecting the new White rail coach, which was run over the Pennsylvania Railroad from Philadelphia to Washington, a distance of 136 miles. The car made the run to Washington for the annual meeting of the American Short Line Railroad Association. It made daily runs during the convention over the tracks of the Washington & Old Dominion Railway, carrying as passengers representatives of the short-line railroads in attendance at the meeting.

While a number of short-line railroads have been operating gasoline rail cars for several years, it is only recently that the gasoline car has come to attract wide attention of railroad men, not only operators of short-line railways, but officials of some of the country's largest transportation systems.

The rail car driven to Washington



WHITE FORTY-ONE-PASSENGER RAIL CAR WITH BRILL BODY AND FITTINGS. NOW IN SERVICE OF NEW JERSEY SHORT LINE RAILROAD

was built for the Union Transportation Company and is now operating over the company's 25 miles of track, between Pemberton and Hightstown, N. J. A twenty-nine-passenger rail car was placed in service several months ago, and its operation proved so successful that a second car of larger capacity was purchased.

The larger car—the one used on the demonstration run—has a seating capacity of forty-one and a baggage compartment directly in the rear of the driver, who controls the car from the right-hand side. The Brill body, which is of semi-steel construction, extends over the engine of a specially designed White rail car chassis. There is a four-wheel pivotal truck in front and two wheels in the rear. It is governed to a speed of 33 m.p.h. Only one speed is provided in reverse, giving a speed of 9 m.p.h.

The trips over the Great Falls division of the Washington & Old Dominion Railway were considered a severe test for the car as the road is a succession of grades and curves, the grades running as high as 3½ to 4 per cent and the curves to 10 deg., with a frequent combination of both grade and curve. The grades were negotiated with ease, and a fair speed was maintained even on the most severe ascents. To demonstrate its reserve power the car was brought to a stop when midway up a grade and again started. It accelerated readily and continued to top of grades without difficulty. This was true in both forward and reverse speeds.

The principal dimensions of the forty-one-passenger car are as follows:

Length over all	33 ft. 10⅜ in.
Width over all	9 ft. 6 in.
Height, rail to top of ventilators, unloaded	11 ft. 1 in.
Wheelbase, total	22 ft. 5 in.
Wheelbase, pivotal truck	4 ft. 0 in.
Weight complete	21,500 lb.

Developments in Gasoline Rail Cars

THE May 19 meeting of the New York Railroad Club was devoted to a discussion of recent developments in gasoline-driven rail cars, with sidelights on the use of gasoline, electric and storage-battery types of equipment, for short-haul and branch-line service.

W. L. Bean, executive assistant New York, New Haven & Hartford Railroad, delivered the principal address of the evening. He told of his road's experience with three thirty-five passenger Mack rail cars put into service early this year. He advocated the lightweight car with two wheels on the rear end; these should have rear wheels of 36 to 40 in. in diameter, with some form of shock absorber.

Railroad men, said Mr. Bean, should not expect that a light car will have power enough to pull trailers, but he did advocate the development of a larger car, to seat fifty to sixty people, with baggage area of 100 sq.ft. This should operate at 40 to 45 m.p.h. in either direction. Other speakers also favored the larger car, using a type of engine not yet developed, with six cylinders and about 110-hp. capacity. Such a prime mover would require the development of a new transmission and rear axle, since none heavy enough is now available.

In discussing future construction, Mr. Bean said the rail cars should operate at high speed obtained on down grade without vibration and should have double ignition and greater cooling service than is now motor-truck practice. The difficulty in operating signal apparatus, due to the electrical resistance of the roller bearings used in the rear wheels, was mentioned and it was predicted that future construction might involve wheels pressed onto the rear axle.

F. S. Gallagher, engineer of rolling stock for the New York Central Railroad, told about his experiences, back in 1891, in developing gasoline rail cars for the Pullman Company. The first passenger cars used on rails had four wheels, he said, and this was increased to eight to secure better weight distribution. It will be hard to convince railroad men that the six-wheel type will operate satisfactorily.

C. E. R. A. Committee Appointments

PRESIDENT Samuel W. Greenland of the Central Electric Railway Association has announced the following committee appointments for the current year:

Auditing—A. R. Baxter, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., chairman; J. S. Clark, V. R. Shick and L. W. Vanbilker.

Annual Transportation — H. A. Nicholl, Union Traction Company of Indiana, Anderson, Ind., chairman; F. A. Healey, G. K. Jeffries, W. S. Rodger and F. W. Coen.

Constitution and By-Laws—Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., chairman; F. R. Coates, C. N. Wilcoxon, F. D. Carpenter and A. C. Blinn.

Finance—C. J. Munton, Fort Wayne & Northwestern Railway, Kendallville, Ind., chairman; G. T. Seeley, J. F. Collins, J. C. McClure and Robert I. Todd.

Hotel and Arrangements—S. D. Hutchins, Westinghouse Traction Brake Company, Columbus, Ohio, chairman; Harry L. Brown, John Benham, James H. Drew and C. Dorticos.

National Safety Council — T. A. Ferneding, Dayton, Springfield & Xenia Southern Railway, Dayton, Ohio, chairman; E. Smith, E. M. Walker, F. A. Bundy and P. H. Palmer.

Publicity—H. J. Kenfield, *Electric Traction*, Chicago, chairman; Harry L. Brown and C. J. Laney.

Resolutions—Joseph A. McGowan, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., chairman; R. A. Crume, J. F. Starkey, Walter Shroyer and G. Muhlhausen.

Rules Governing Interchange of Equipment—C. S. Keever, Union Traction Company of Indiana, Anderson,

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Ind., chairman; E. B. Gunn, H. Bullen, G. K. Jeffries and C. C. Fast.

Education and Training of Employees—H. C. DeCamp, City Railway, Dayton, Ohio, chairman; A. Swartz and Samuel Riddle.

Uniform Charges for Repairs to Interchanged Equipment—A. W. Redderson, Indiana Service Corporation, Fort Wayne, Ind., chairman; P. V. C. See, R. C. Taylor, M. Ackerman, J. F. Elward and B. J. Jones.

Program—J. P. Barnes, Louisville Railway, Louisville, Ky., chairman; H. C. DeCamp, J. C. Schade, Samuel Riddle and L. G. Parker.

Supply Men—M. B. Lambert, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., chairman; C. C. Creighton, J. A. Donahey, E. C. Folsom, W. D. Hamer, C. T. Dehorn, H. H. Buckman, S. W. Crawford, E. J. Smith, E. S. Sawtelle, G. L. Kippenberger, James C. Jameson and Robert J. Deneen.

Electric Railway Express—F. D. Norviel, Union Traction Company of Indiana, Anderson, Ind., chairman; J. A. Greenland and R. R. Smith.

Transportation—Bert Weedon, Interstate Public Service Company, Indianapolis, Ind., chairman; James S. Clark, Henry Gebhart, W. S. Whitney, C. O. Sullivan, J. H. Pound and R. A. Crume.

New England Club Honors Mr. Foster

THE regular May meeting of the New England Street Railway Club was held on May 25 in Manchester, N. H., in honor of E. C. Foster, the president of the local traction and light system, who had on that day completed fifty years of service in the street railway industry. Nearly 250 members attended the meeting and day's entertainment.

The day closed with a testimonial banquet at which Gov. Albert O. Brown of New Hampshire; A. W. Phinney on behalf of the city of Manchester; Henry C. Page, Worcester; Edward Dana, Boston, and P. F. Sullivan, Boston, spoke of the life work of Mr. Foster and of his unfailing record in never having labor troubles on any of his properties.

The remainder of the program may be summarized as follows: The party met at 11 o'clock at the Traction street carhouse, where four special cars and two Mack motor buses took them to Pine Island Park for a ride and inspection trip. A buffet lunch was served at noon upon the return of the party from the park trip. In the afternoon there was a formal meeting at Lake Massabesic, at which five new members were voted in and a highly interesting paper was presented by F. E. Webster, vice-president Massachusetts Northeastern Street Railway, on the history of street railways and power development in New Hampshire from the time of the first horse car line to date.

A musical comedy entitled "Oh! Boy Jackie" was staged after the meeting by the men employees of the company, and their wives and sweethearts took the feminine rôles. During the evening banquet they also rendered songs and did much to enliven the meeting. Following the show the party again boarded the cars and went to the Brook Street power station, the principal high-tension substation in the city. After leaving this station they went direct to the banquet hall.

American Association News

Convention Exhibits Committee Appointments and Planning

THE committee on exhibits held a meeting in Chicago on May 4 to give consideration to the numerous detail arrangements to be made in connection with the planning of the exhibition, provision of meeting rooms for the convention, etc. Those in attendance were Chairman E. J. Blair, H. H. Adams, C. H. Jones, Roy Holden, J. C. McQuiston, Fred Dell, L. W. Shugg, R. B. Fisher, L. E. Gould and Mr. Bowmen, representing the Chicago Association of Commerce.

After discussing various problems that came up in connection with holding the convention on the great Municipal Pier, such as provision of various kinds of power, air, space for noisy units, space for cars, etc., it was concluded that there were no insurmountable difficulties and that the pier offered facilities which will perhaps result in the most attractive and successful exhibition ever held by the association. After an all-day meeting, including an inspection of the pier, the committee was quite enthusiastic as to the outlook.

It was decided that the minimum space will measure 10 ft. x 20 ft. and that the price of space shall not be in excess of $1 per square foot, the understanding being that as soon as definite estimates of expenses have been prepared the charge will be fixed as much below $1 as is practicable, as the association desires that the manufacturers have space at actual cost. It was decided to provide meeting rooms at the outer end of the exhibit hall so that all delegates will pass through the exhibits in going to and from sessions.

A decision was also reached that it is desirable to operate a restaurant on the pier during the week of the convention and that it should be of just as high grade as is practicable. Space and equipment will be available for this purpose in the middle of the north pier house opposite the exhibit hall, the committee having decided that the south pier house would be better suited for various reasons for the use of the convention.

Exhibits Director Appointed

Extensive study and planning for the convention has been actively pressed by chairman Blair since the committee meeting with the result that a more satisfactory arrangement with the pier authorities has been obtained and a director of exhibits appointed. For this important task C. W. Kelly was selected. Mr. Kelly is secretary-treasurer and director of exhibits of the National Railway Appliance Association. He is already well organized, with an office in Chicago, to handle the full details of the October convention. His long experience in arranging large exhibits of railway materials gives him a thorough understanding of the many ramifications of the work and the committee believes that his service will be of the highest value.

Personnel of Committee

The appointments on the committee on exhibits are as follows: E. J. Blair, chairman, assistant to president Chicago Elevated Railways; W. J. Cummings, McGuire-Cummings Manufacturing Company; Charles H. Jones, Chicago, North Shore & Milwaukee Railroad; H. H. Adams, Chicago Surface Lines; J. C. McQuiston, Westinghouse companies; L. W. Shugg, General Electric Company; R. B. Fisher, Buda Company; W. J. Walsh, Galena-Signal Oil Company; and R. R. Holden, Hagerman Castle Corporation.

Letter to the Claims Association

CECIL G. RICE, president American Electric Railway Claims Association, is sending a series of letters to the members of that organization to apprise them of its work. The sixth in the series was issued on May 13 and reads as follows:

Once upon a time I was touring. It was not my machine. We know we were headed in the right direction, but were not positive we were on the right road.

That's my situation with Claims Association progress. I know where we're going, in spite of everything, but I'd sort of like to have YOU say a few words about the road we're traveling.

Let's see whither we have been going, according to my diary:

April 13—Many commented on this letter. It made them think better of themselves and let the "boss' know we were able to sit up and take nourishment. *Acra* published it.

April 20—Everybody likes the "Code." They realize it is an analysis of their present practice clearly stated. "Dignifies Claims Work."

April 24—It was a "dud." I asked for suggestions and surveys. Guess it was too long or too heavy, for replies have been few.

May 4—Worked hard on that outline of association plans. Some comments. Not many. ELECTRIC RAILWAY JOURNAL published it.

May 13—This is it. Better slow up now until we find out where we stand. Thirteen is lucky. I complete thirteen years of service July 1, 1922.

Here's the point. When touring we sure would have been glad if some one had said: "Buddy, if you're going to Chicago you're headed right," or "You'd better turn off if you want to get there by Oct. 2, because this road is closed."

The same goes for my midnight oil work for the Claims Association. I'd like to know what YOU think about our speed and direction. Are we on the right road? If you have already written me something nice, forget this. If not, shoot me a letter of criticism or commendation, either one. Don't be stingy. Say it out loud. Do it now.

The big idea is to get you to catch up with those four letters because I've written another little book. It's going to stir you up. The "boss" will sit up and take notice too. I am expecting you will want to write me about it sure. "How a Claim Should be Adjusted" is the title of the new book.

It may not be what you expect, but you'll like it all right. Do you want a copy?

Good luck to you until I hear from you or you hear from me.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Wild and Fantastic

Philadelphia Rapid Transit's $290,000,000 Valuation Claim So Characterized by City's Expert

Robert M. Feustel, valuation expert for the city of Philadelphia, forwarded to City Solicitor Smyth on May 23 a letter embodying his views on the railway matter there. The letter was accompanied by the city's figures on the valuation of the Philadelphia Rapid Transit Company. Mr. Feustel held forth city ownership of the entire transit system in Philadelphia as a possible solution of an impossible situation.

Mr. Feustel's letter would indicate that the city does not expect a valuation sufficiently large to enable the company to pay underlying company rentals as well as P. R. T. dividends. The position of the company was set forth in lucid language by Mr. Feustel as one that held no hope for the future in that no valuation figure that could reasonably be fixed by the commission would afford a return sufficient to enable the company to attract the inflow of fresh capital which is necessary for it to keep pace with the growth of the city.

Mr. Feustel rejects the company's valuation claim of more than $290,000,000 as "wild and fantastic," and urges that the recent experience of the city in the Frankford elevated negotiations be not repeated.

As an alternative, he suggests that the city take the company in as its partner in transit business, so that the city could construct high-speed lines as well as provide the money for surface extensions that the company is unable to raise. Mr. Feustel says in part:

> This company has built scarcely a mile of extensions in the last ten years. During this decade, the population has grown by 300,000, and the total passengers carried has increased 80 per cent. The drain upon its resources, caused by its burdensome fixed charges in the form of guaranteed rentals and bond interest, has been in the past and will continue to be the real reason for this company's failure to keep pace with the growth of the city. By absorbing so high a proportion of net earnings as to render the company's financial condition markedly unsound, these guaranteed rentals have made it impossible to attract that constant inflow of fresh capital which a large utility system must have to enable it to make extensions and betterments.
>
> Without attempting to forecast the nature of a judicial determination of value by the commission and the courts, it is significant to point out that before P. R. T. can establish its present stock issue on a 6 per cent basis and continue to meet its underlying obligations, it would have to receive a return of at least 8 per cent on a valuation of at least $150,000,000, a valuation $30,000,000 more than it would cost to reproduce the property today in its present physical condition, and $20,000,000 more than the cumulative investment from 1854 to date, including superseded horse car, cable and early electric lines. Unless the commission departs from its established practice of allowing a 7 per cent return the rate base must be increased to $172,000,000 to produce the $12,000,000 net return required.
>
> Again, disregarding the wild and fantastic claim for valuation put in evidence by the company's witnesses, it is of even greater significance that the company's latest official pronouncement on the transit problem of Philadelphia is based on the tacit assumption that the future holds forth no promise of any revenues sufficient to enable the company to attract new private capital into its system. The company's prediction that only public money will furnish future extensions in Philadelphia traction system, whether of high-speed or of surface lines, may be taken as a frank admission that under its present financial setup, no valuation that could reasonably be fixed by the commission would afford a return sufficient to enable the company to meet the necessities of the growth of Philadelphia.
>
> How the necessary public money should be obtained is an important problem; but this is, after all, not the most vital part of the transportation problem. Whether the funds are raised by borrowing or by assessment of local benefits, they will be raised if and when they are needed. But before they are raised a satisfactory answer should be received to the question: "What treatment will be accorded the necessary public money which is contributed toward the construction of an adequate transportation system in Philadelphia?"
>
> It is not the purpose of this letter to formulate such an answer. It is sufficient to say that the facts in the report transmitted herewith must be the foundation upon which any effective partnership between the city and the company is reared. In general it may be said that two courses are open to the city. The first is to acquire the ownership of the entire existing system and add to it the units deemed necessary. The second is to share with the present owners the proceeds of the joint system which will result from the city's money contribution.

His report accompanying this letter contains 259 printed pages with many tables and charts. The following table appears in the book and is entitled "The Basis for a Fair Valuation":

REPRODUCTION FIGURES	
No. 1—Company's estimated cost of reproduction new based on prices as of date of closing of inventory June 30, 1919	$290,729,742
No. 2—Check of company's cost of reproduction new based on prices as of date of closing of inventory June 30, 1919	187,553,326
No. 3—Check of company's estimated cost of reproduction new based on prices of June 30, 1919, after deducting depreciation which has actually taken place	147,339,822
No. 4—Cost of reproduction new based on latest prices available—first quarter of 1922	147,870,575
No. 5—Cost of reproduction new based on prices of the first quarter of 1922, after deducting depreciation which has actually taken place	116,504,042
INVESTMENT FIGURES	
No. 6—Total capital paid in on securities issued as of June 30, 1919	125,284,036
No. 7—Cumulative total investment or historical cost as of June 30, 1919, including horse car, cable and early electric lines	128,835,370
No. 8—Cumulative total investment or historical cost as of June 30, 1919, after deducting superseded property	109,568,007
No. 9—Original cost new of the present existing property	108,784,068
No. 10—Original cost new of the present existing property, after deducting depreciation which has actually taken place	89,024,521

Dispute Over Paving Settled

Diplomacy has won the day in the threatened stoppage of electric railway transportation at Muscatine, Ia., for at a conference between President B. J. Denman of the Muscatine city lines and the Councilmen meeting in special session the terms of the railway were accepted and the demands of the city withdrawn.

The city had insisted on a repaving program which would have entailed an expense of $50,000 on the company. The program called for relaying of track and paving with brick on several streets. The company offered a substitute program of paving between rails with macadam, paving street intersections with brick or asphalt to harmonize with the city paving and the re-equipment of certain lines with better, but not new rails. The city refused to accept this offer at first and the railway finally declared it would suspend operations and tear up the rails, dismantling the railway plant in case the $50,000 expenditure was insisted on. The railway officials set the date for a final show-down at May 20.

Citizens of Muscatine rose up in arms when the possibility of losing the railway system became known. Their protests to the City Council resulted in the calling of a special meeting to which President Denman of the traction lines was invited. The company's offer as outlined in a letter to the Councilmen a few weeks previous was accepted unanimously.

$150,000 for Extensions

Differences between the city of Dallas, Tex., and the Dallas Railway, which resulted in a public hearing before the City Commission on a proposal to restore the 5-cent fare, have been amicably settled, and the railway will continue to charge a 6-cent fare on all its lines. The matter was finally disposed of when the officials of the company, through Judge W. M. Holland, president, gave the City Commission formal notice that the stockholders were ready to repay into the company's treasury $111,400. The city claimed that this sum had been wrongfully applied to the payment of dividends. It will now be made available for betterments and additions to the company's lines, such expenditures to be added to the value of the company's properties.

It is announced that in addition to the $111,400 returned to the company's treasury by its stockholders, the excess earnings during April will bring the sum available at this time for extensions and betterments to nearly $150,000.

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Bacharach Bill a Menace

Measure Is Unlikely to Pass, but It Attracts Much Attention as a Dangerous Symptom

Another hearing was held on the Bacharach bill before the House judiciary committee in Washington on May 23. This measure, which proposes to limit the power of federal courts in injunction proceedings, is not expected to become a law in the nea future, but great interest is shown in the measure, and the hearings are well attended by many who believe the bill is a dangerous and improper one. The hearing of May 23 was stopped by the demand for the presence of members of the House on the floor to answer to roll calls, and another hearing was set for June 8.

The chief witness at last Tuesday's hearing was Alfred P. Thom, general counsel of the National Association of Railway Managers, who appeared in opposition to the measure. He took the position that the proposed bill was unconstitutional in that it would emasculate the equity powers of the Federal courts, rendering them incapable of granting relief.

ONLY ONE PROPONENT HEARD

The only proponent to be heard in behalf of the bill was S. A. Ettleson, Corporation Counsel of the city of Chicago. He related experiences of the city government of Chicago with the traction company there, and said the enactment of the Bacharach bill would save the citizens of Chicago $60,000 a day. Corporation Counsel Ettleson stated that the traction company and the city of Chicago had effected a settlement of their disputes in 1917, the traction company accepting an ordinance for a 5-cent fare, and for the payment to the city of a portion of the gross receipts. In violation of its contract, he claimed, the traction company applied to the Illinois Public Service Commission for an increase in fare because of war conditions, and was given an advance of 1 cent, then 2 cents, and finally 3 cents. The city of Chicago appealed to the State courts, the witness said, and the case finally reached the State Supreme Court, which sustained the commission. An appeal to the United States Supreme Court was then taken, but without redress, as that court sustained the lower courts. Thereupon the elimination of the Public Utilities Commission became an issue at the next election on the ticket headed by Governor Small. It was the understanding that a State Commerce Commission would be appointed in place of the utilities commission and that the new commission would reverse the decision of the former body, the witness said.

When Gov. Small appointed the commission the city of Chicago appealed for a reduction in traction fares and after hearing extending over four months, and the taking of 4,000 pages of testimony, the railway fare of Chicago was fixed at 5 cents. The company then appealed to the federal courts, and was granted an injunction which is still in force. It was contended by the Corporation Counsel that by the enactment of the Bacharach bill the State Commerce Commission would no longer be hampered by the Federal Courts in carrying out the wishes of the people.

The State Bar Association of Ohio was represented by F. E. Eagleson, of Columbus, who contended that the bill if passed would deprive the Federal courts of fundamental jurisdiction. Mr. Eagleson paid his respects to Mayor Hylan of New York, stating that his Honor's testimony was unworthy of consideration, and that his intimations that justice was perverted behind the scenes showed him to be unfit to be a judge and unworthy of the high honors bestowed upon him by the City of New York.

Mayor Curley Attacked

Thomas Carens writing in the Boston *Herald*, for May 18, says that by practically unanimous vote the Massachusetts House of Representatives the day before consigned to oblivion all the attempts by Mayor James M. Curley and others to bring about a repeal of the Boston Elevated Railway public control act of 1918, or to attack its validity. Mr. Carens says that this action followed the most brilliant speech of the present session, delivered by Speaker Benjamin Loring Young from his old place on the floor, and in which he bluntly charged that Curley's whole course during the session has not been in the interests of the car-riding public, but of the "same old gang" which brought the Boston Elevated to the verge of bankruptcy in 1918 and which would jump at the chance to take it back in its present rehabilitated condition.

Reduction of Three Cents an Hour Announced

The Colorado Springs & Interurban Railway, Colorado Springs, Col., has made an arrangement with its employees whereby a uniform reduction of 3 cents per hour in the rate of pay will take effect on June 1 next. For the train service in cents per hour the scale will be as follows:

	One-Man Cars	Two-Man Cars
First three months.....	52	45
Second nine months.....	55	48
After one year.....	57	50

Wage Agreement Reached

The New Orleans Railway & Light Company and the Amalgamated Association, have reached an agreement as to the scale of wages which is to obtain during the ensuing year, beginning June 1, 1922. The pay is to be 45, 47 and 51 cents an hour, according to length of time in the service, as is now being paid under the existing pay agreement. Judge Foster approved the agreement as presented by Receiver O'Keefe on May 17.

Utilities Not Insured Against Loss by Commission

"The Public Service Commission does not insure a utility against loss. If poor business judgment has been exercised in the management of a property, the public should not suffer thereby. Neither should future rate payers be called upon to reimburse the company for losses sustained by insufficient rates granted to past consumers of the company."

The ruling was made by the Public Service Commission of New York on May 22 in an order issued to the Western New York Utilities, Inc., of Medina, directing that it return to electric rates charged the public in Albion, Barker, Lynonville, Medina and other places and fourteen towns in Orleans, Niagara and Monroe counties prior to Feb. 23, 1921, when the company increased its rates. The present rates are to be set aside June 1 and the former rates charged are to prevail for a year and thereafter until changed by the commission. The average reduction is about 15 per cent.

Men Vote on Wage Reduction

Employees of the Connecticut Company in all cities where the company operates have voted this week on the wage reduction proposition, and while the figures have not been compiled for tabulation it is a known fact that at least 90 per cent, if not more, have voted against the decrease proposed by the company. At present most of the regular trolley men work nine hours a day and at the 55-cent wage scale prevailing for employees of more than a year's standing they receive an average of about $4.95 a day. If the company's scale of 50 cents an hour were accepted it would mean a reduction to $4.50.

A year ago trolley men were receiving a wage scale of 54 to 60 cents an hour based on length of service. Under the decision of an arbitration board of three members a reduction of 8½ per cent was agreed on, and the present scale provides 47 cents an hour for the first three months, 51 cents for the next nine months and the maximum of 55 cents for employees of over a year's experience.

New Scale in Effect

An agreement has been reached covering the rate of wages to be paid employees of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., for the year beginning May 1, 1922. The following scale in cents per hour is in effect:

Operators of one-man cars:
- First six months 41
- Second six months 43
- Thereafter 46½

Interurban:
- Passenger trainmen 46½
- Freight and express 48¾

To employees other than the above who are members of the Amalgamated Association of Street and Electric Railway Employees of America, wages were reduced 3½ per cent from the rates in effect up to May 1, 1922.

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Federal Charter Refused

Present Fares at Vancouver May Be Extended Until New Commision Functions

The petition of the British Columbia Electric Railway, Vancouver, B. C., for a federal charter, which would have the effect of taking the railway out of provincial and civic control, was refused by the railway committee of the private bills committee of the Dominion parliament on May 2. This action followed opposition by the provincial government, the city of Vancouver and the Union of Canadian municipalities, which foresaw similar moves elsewhere should the application succeed.

The government of the province of British Columbia has in the meantime agreed to the appointment of some kind of commission which would pass upon the present problems of the British Columbia Electric Railway or which would form a permanent public utilities commission. All the cities and municipalities affected with the exception of the city of Vancouver have agreed to extend the present fares until such committee functions, which cannot be until the next session of the provincial house which takes place next autumn or winter.

The position in Vancouver and surrounding district is that the present rates of fare, which were extended from time to time by agreement, stop on June 30 next unless another extension is granted. The fare in Vancouver would then revert from 6 cents to the 5 cents stipulated in the franchise. The company intimates that it cannot operate on a 5-cent fare.

Last year foreseeing this difficulty as well as the necessity for obtaining stability if new capital was to be obtained, the company proposed a new franchise with the cities and districts affected but negotiations failed. As an alternative to the Dominion charter, it proposed a retention of the present fares for a number of years and this may now be the solution.

The company is faced with requests for a number of extensions to its railway lines, the necessity for building new power plants at a cost of $10,000,000 and the need for extending its gas distribution system, all of which need new capital.

Further Action Taken in Taxpayers' Suit

Mayor Hugh M. Caldwell, of Seattle, Wash., has taken the first steps to relieve the general tax fund of all liability in connection with the administration, maintenance and operation on the municipal railway. This action is in compliance with the State Supreme Court's recent decision in the "Fourteen" taxpayers suit. After conference with the other city officials, Mayor Caldwell announced that he would at once recommend to the City Council that the legal, accounting and purchasing work of the railway system be segregated from the work of tax-supported departments, and hereafter paid out of the railway revenues. Heretofore, the corporation counsel's office had cared for all the railway legal business involving the employment of a considerable number of assistants and claim agents. Numerous employees of the city comptroller's office have given all their time to railway accounting, and the general railway purchasing has all passed through the regular city purchasing agent. These offices are all maintained by general taxation, and under the Supreme Court decision, no money so raised can be used for the railway.

Bill for Transit District Deferred

The George Louis Richards bill, reported in the ELECTRIC RAILWAY JOURNAL issue of May 20, which would create a Metropolitan Transit District for Boston and take two divisions from the Eastern Massachusetts Street Railway and add them to the Boston Elevated so as to have a unified system within a single-fare area, will not be passed by the Massachusetts Legislature this year. The legislative committee on street railways has decided to redraft the measure so as to submit the street railway provisions in it to the State Department of Public Utilities for a study and a report to the next Legislature.

While the Boston Elevated favored the original bill the Eastern Massachusetts opposed it, but the opposition is not to the general idea of a unified system. If the Eastern Massachusetts is assured of adequate compensation for the division it is called upon to give up it will approve the plan. Taking the property by the right of eminent domain would place the valuation in the hands of the courts, and probably be acceptable to the company.

Will Draft Ordinance for Interurban Operation

It has been agreed upon by officials of the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., and Chairman Gallmeyer of the special railway committee of the City Council that, so far as the operation of interurban cars over city tracks is concerned, an ordinance should be drafted by each side looking toward relief in the congestion caused by the interurban cars in Monroe Avenue. These drafts will be the basis of an ordinance which will be presented to the City Commission.

This matter has been before the City Commission unofficially several times. The railway has no franchise from the city, having operated for several years under a rental contract with the Grand Rapids Railway. This contract terminated about a year ago, and the street railway officials declined to renew it, on the ground that it interfered with the city cars to such an extent as to make the operation of the interurbans undesirable at any price. It also claimed that the great weight of the interurban cars caused more depreciation to the street railway equipment than the amount of the rentals. The interurban company brought suit in the Circuit Court to enjoin the city railway from ousting it. This suit still is pending, but negotiations are under way to settle it out of court. City Commissioners are unanimous that interurban cars cannot be permitted to continue operations in the downtown business streets.

Ordinance Restraining Jitneys Upheld

The Fourth Court of Civil Appeals at San Antonio, Tex., has reversed the decision of Judge Robert B. Minor in the Seventy-Fifth District Court in the "jitney" case and has ordered the temporary injunction granted by Judge Minor dissolved. This temporary injunction restrained the city officials from enforcing the provisions of the jitney ordinance, which restricted the operation of the jitneys in San Antonio to certain lines and forced them to operate on a fixed and previously announced schedule.

The ordinance rerouting the jitneys was passed by the city on Dec. 1, 1921, and was twice amended by the city, the last time on Jan. 30, 1922. It directed the removal of jitneys from all the principal downtown streets and rerouted lines through the residential district in such manner that they would nowhere be in competition with the electric railway lines. The ordinance was enacted as a compromise agreement with the traction company in return for reduction in passenger fares. With the dissolution of the injunction granted by Judge Minor the city is now enforcing the terms of the ordinance.

Frank R. Williams, chief counsel for the jitney men, announced that the jitneys would fight the ordinance through the court of last resort. No notice of appeal has yet been filed. Meantime the city is enforcing the ordinace.

Schenectady Situation Threatening

John H. Reardon, the International officer who is in charge of the situation in Schenectady, N. Y., went to Detroit to confer with W. D. Mahon, International President of the Amalgamated Association. On the return of Mr. Reardon, a meeting of the Schenectady division will be called, and it is declared probable the crisis will be precipitated on a motion for a vote of confidence in the present officials, who are confident of support. In this connection it will be recalled that James F. Hamilton, president of the Schenectady Railway, has refused to deal with the union on a new agreement while the present officers are in charge of its affairs.

Since May 1 the Schenectady men have been working without a contract and as a result the company has not taken up any question with the union officials. This is taken as an indication by many employees that the organization is not functioning, and has caused many to lapse in dues.

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Chicago to Vote on Rapid Transit Plan

Voters of Chicago will have a chance next November to decide whether they are to have subways, if recommendations of a subcommittee of the Chicago City Council are approved. This plan was adopted on May 19 at a meeting where the presidents of the surface and the elevated lines reported that they had no new proposal for transportation improvement to offer. The subcommittee then directed its engineers and lawyers to prepare plans and an ordinance to be submitted to the Council.

The city has more than $30,000,000 available in the traction fund and it is intended to use this for an independent subway system if an agreement cannot be made with the existing companies. The city administration is opposed to making an arrangement with the companies and while the Aldermen are more friendly it has been impossible up to the present to get on a common basis.

The chairman of the Council committee, Alderman Schwartz, is anxious to have his own plan favored. This calls for the issuance of a form of security to purchase the existing lines and it is not likely that this will be considered favorably until the value of the certificates has been proved by a test case in the Supreme Court.

Receivers Freed from Custody

Receivers Huff and Lee of the Steinway Railway won a victory over District Attorney Dana Wallace, who tried to prevent them from charging a separate fare on the Steinway lines. The lines, until the receivership, were a part of the New York & Queens County Railway. The receivers were freed from custody when Justice Cropsey in the Queens Supreme Court, Long Island City, sustained the writ of habeas corpus. He said in his finding that there was no obligation upon the receivers to operate the lines so that a 5-cent fare would be continued over the New York & Queens system and suggested that the Transit Commission could fix a joint fare, but this question had not been brought into the argument.

"The Reason Why" for Extension on a Scientific Basis

Maps of the Twin Cities are made by the Twin City Rapid Transit Company, Minneapolis Minn., showing every structure in either city, and each fall these maps will be brought up to date by addition of structures erected or started up to September. Buildings of each year will be distinguished by different colors. These maps will be the basis of the Minneapolis Street Railway or the St. Paul City Railway toward applications or demands for extensions of the lines in any part of either city.

Needs in other ways may be studied from this street railway map just as well as the needs of more or new street car services, such as school houses and parks. They will show the trend of growth and the character of this growth, whether in residences, apartments, duplexes, or industries. H. W. Ralph, superintendent of schedules, and his assistant, Peter Skurdasvold, have been working on the maps since last September, and only the loop district sections are unfinished. The reason for working on outskirts first is that there is where the demand comes first for extensions of lines. Decision as to extensions of trolley lines will hereafter be on a purely scientific basis.

Mr. Ralph said that heretofore it had been necessary to guess at such important matters as to growth and need for line extensions, but that now in defining to the authorities its attitude toward various requests for service extensions of all kinds, even to preparation of streets for trackless trolleys, the company would find the maps invaluable.

Regulate Buses or Lose Trolley!

Electric railways must cease operation if jitneys and buses are allowed to go unregulated, in the opinion of Alfred Fischer, director of the Public Utility Information Bureau, Ann Arbor, who has published two articles on the "plight of Michigan's electric lines" in the Detroit *Saturday Night*.

The proper relation between the two systems of transportation is for the bus to act as a feeder in thinly developed districts. This Mr. Fischer makes quite clear. He explains that the first agitation for bus regulation has demanded that the buses shall be operated by trolley companies. He differentiates between city bus service and the intercity bus service, and he points out that excessive taxation of the truck operators will be unfair. Legislation must equalize the burdens of the common carrier paying taxes to the state for a private right of way and his competitor who operates over highways maintained by the state.

The final solution of the ownership or control of transportation means will be based on good service at cost to cover the expense of giving that service. Those who can give the service best will win. This, Mr. Fischer feels, is the moral to gain from the competition of the bus, the discussion as to public ownership and the problems still facing the railways.

Seeks to Hasten Hearing

The Supreme Court has been requested to advance for hearing the case of Henry F. Mueller and others vs. Samuel W. Adler, on appeal from the District Court for the Eastern District of Missouri, involving the United Railways of St. Louis. Mr. Adler, a mortgage bondholder, filed a suit for a receivership and enforcement of a lien against the company, alleging that the railway had acted contrary to its covenants in its deed of trust. Under this bill a receiver was appointed, who is still acting.

News Notes

Must Continue Service.—The Public Utilities Commission has ordered the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, to continue operation of its Columbus-Orient, and Lima-Defiance branches until Sept. 1, when the case will be reopened for further argument.

One-Mile Municipal Line Privately Operated.—The Minneapolis (Minn.) Street Railway will operate a municipally owned trolley line for the benefit of residents between the Columbia Heights Street car line and the city's water filtration plant, more than a mile distant and in an adjoining county. The company will furnish a motorman and the power and will assume all liability. Only one car will be required and a 5-cent fare for the round trip is planned. The car and the track are furnished by the city, which will pay the company $4,000 a year and will take on no liability insurance. Service is to begin on May 1. The line has been utilized to haul materials to and from the water plant.

Sioux City Line Presents Alternatives.—A fare increase or a wage cut is the solution to the present problem of the Sioux City (Ia.) Service Company, which the president, R. J. Dunham, offered to city officials and representatives of the employees. Mr. Dunham said that the debt of the company is half the value of the property, and that the net loss during the year ending Dec. 31, 1921, was $35,262. The amount of the suggested wage cut was not stated, but Mr. Dunham said that a decrease or increase of 1 cent an hour means a loss or gain to the company of $8,500. In the last two years, according to officials of the city, the fare has been increased from 5 cents to 7 cents, with four tokens for 25 cents, and the city has ruled the jitneys from the streets.

Traction-Highway Line Under Road Commission.—The Indiana Highway Commission is about to become the owner of a stretch of interurban railroad—only a few hundred feet in length, to be sure, but none the less a railroad. The "line" is a stretch of track across the traction-highway bridge at Terre Haute, now owned by Vigo County. The bridge is used by the Terre Haute-Paris line of the Terre Haute, Indianapolis & Eastern Traction Company and was built by Vigo County. The interurban company pays an annual rental for using the bridge. Now that the highway commission has taken into the state system the road on which the bridge is located, it is necessary also to take over the trackage. The commission will send an engineer soon to confer with county authorities on the purchase price.

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Financial and Corporate

North Shore Line Earnings Increase

During the calendar year 1921, the Chicago, North Shore & Milwaukee Railroad showed an increase in gross earnings of $307,137. This record was made in spite of a decrease in amount of traffic of approximately 9 per cent due to the unfavorable business conditions, which were especially pronounced in the manufacturing cities of Kenosha, Racine and Milwaukee. The increase in gross earnings is attributed mainly to the change in intrastate rates in Illinois and Wisconsin which became effective on July 14, 1921.

CONSOLIDATED INCOME STATEMENT, CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD
(Including Milwaukee City Lines)

	1916	1917	1918	1919	1920	1921
Operating revenue	$1,157,191	$1,751,373	$2,899,975	$3,237,921	$4,193,869	$4,507,366
Operating expense	714,887	1,114,512	1,856,038	2,319,464	3,229,048	3,440,761
Net revenue	$442,304	$636,861	$1,043,937	$918,457	$964,621	$1,066,605
Taxes	66,038	95,680	185,822	163,101	151,746	225,844
Operating income	$376,266	$541,181	$858,115	$755,356	$812,875	$840,761
Non-operating income	6,208	4,858	9,470	17,879	10,332	11,972
Gross income	$382,474	$546,039	$867,585	$773 235	$823 707	$852,733
Fixed charges	237,966	266,580	332,506	341,396	390,196	463,013
Net income	$144,478	$279,459	$535,079	$431 839	$433,011	$389,720

In the annual report prepared by President Britton I. Budd, a decrease in net income of $43,291 is laid to the operation of the first six months. During this time operating costs were abnormally high and could not be overcome during the remainder of the year notwithstanding an increase in rates as already mentioned and a general decrease in wages and salaries effective on June 16.

The amount expended for capital requirements during the year was $591,683. During the year the company issued and sold $500,000 of fifteen-year, 7 per cent sinking fund collateral notes secured by first mortgage bonds. On June 15, 1921, $260,000 of serial notes fell due and were paid. The company also paid during the year $72,000 of equipment notes and $71,000 of the ten-year and fifteen-year sinking fund notes through the sinking fund.

Mention is made that work has begun on the construction of a new brick passenger station at Kenosha which will be ready for use this spring. A new brick passenger station at Indian Hill is also under construction.

During the year, employee accidents were reduced approximately 17 per cent, and accidents resulting in injury to the public or damage to public property decreased approximately 24 per cent. Collisions with vehicles, collisions between cars and derailments were reduced 33 per cent, as compared with the previous year. These results were accomplished through the various channels of the safety organization which held more than 100 safety meetings of employees, distributed literature and conducted periodical inspections of equipment and properties.

The comparative income account for the years 1920 and 1921 and a consolidated income statement for the past six years are presented in the accompanying tables.

COMPARATIVE INCOME ACCOUNT FOR 1921 AND 1920 CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD

	1921	1920	Increase or Decrease
Operating Revenue:			
Passenger revenue	$3,980,879	$3,686,631	$294,248
Freight and express	477,898	471,496	6,401
Miscellaneous revenue	42,029	35,542	6,487
Total	$4,500,806	$4,193,669	$307,136
Operating expenses:			
Way and structures	$491,160	$373,331	$117,830
Equipment	352,358	311,912	40,445
Conducting transportation	1,377,462	1,461,226	83,764*
Power	458,302	432,020	26,282
Traffic	100,972	65,833	35,140
General and miscellaneous	660,507	584,725	75,782
Total	$3,440,761	$3,229,047	$211,713

* Decrease.

$10,000,000 Freed by Court

By a decision of the United States Supreme Court on May 15 that the New York statutory gas rates of 80 cents were confiscatory during the calendar years 1919 and 1920 the seven gas companies allied with the Consolidated Gas Company receive approximately $10,000,000 which had been impounded pending the outcome of the rate cases.

The decision just rendered was delivered in cases appealed by the State and county authorities from the decision of the United States District Court of New York City that the rates were confiscatory. Appellants contended that the Consolidated decision was not binding in the other cases in that it covered cost conditions in 1918 and eight months of 1919, while the other cases presented different conditions in the last four months of 1919 and throughout 1920.

The questions passed upon in the original decision of the court in this case were referred to in an editorial in the ELECTRIC RAILWAY JOURNAL for March 11, 1922.

Plan for Sale and Reorganization Approved

At a special meeting of the stockholders of the Tennessee Railway, Light & Power Company, Chattanooga, Tenn., on May 19, the plan calling for the sale of all the assets of the company was ratified. The plan, the details of which already have been made public, will now become effective, E. W. Clark & Company, Bonbright & Company, H. M. Byllesby & Company and Hodenpyl, Hardy & Company, who are large holders of preferred and common stock, having previously expressed their intention as stockholders to exchange their stock and exercise their full subscription rights to the new issues provided under the terms of the plan.

These firms have agreed to underwrite without compensation the second preferred and common stock of the new company offered for subscription and not taken by the stockholders. They will also participate in a small commission offered alike to all bankers and brokers for service rendered in connection with the deposit of securities under the plan.

Through the approval of this plan the company will be enabled on June 1 to face its maturities aggregating $3,561,000, it being the opinion of the stockholders as well as that of the board that the plan is the best means of caring for these obligations and protecting the interests of the company.

Employees Purchase 40 per Cent of Stock Issue

In two days time 480 of the 600 employees of the Wisconsin Gas & Electric Company, Kenosha, Wis., purchased $200,000 of the company's issue of $500,000 of 7 per cent preferred stock. According to the custom of that company the issue was to be sold directly to the public in small amounts. However, before opening the public sale, an opportunity was given the employees of the company to become shareholders. Notwithstanding heavy purchases by them in the past of stocks and bonds or notes of the company, 480 of them came forward in two days time and absorbed two-fifths of the issue. The purpose of the company in floating this $500,000 issue is to finance its 1922 program of service improvements, betterments, etc. The offering was referred to in the ELECTRIC RAILWAY JOURNAL, May 13, page 805, in reciting results of the Milwaukee stock campaign.

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Suggestion that Taxpayers Share Cost of Improvements

Philadelphia Rapid Transit President Favors City Ownership of Railways with Private Operation and a Share in the Profits for the Management and Men—His Magnum Opus in New Drive

THOMAS E. MITTEN, president of the Philadelphia (Pa.) Rapid Transit Company, says that the ultimate answer to the transit situation there lies in city ownership of all subways, elevated and surface tracks under company operation, with co-operative accomplishment rewarded by added compensation to men and management. He says that the cost of added transit should be properly apportioned as between general taxation and assessment of benefited property. His suggestion is that the company supply cars, power and movable equipment and operate under lease, revocable by the city, with assumed protection of the company's investment and a reasonable return thereon.

Mr. Mitten's suggestions are contained in a twelve-page pamphlet addressed to the Mayor of Philadelphia, members of the City Council, the Public Service Commission, the joint transit committee, P. R. T. stockholders and interested citizens generally. The pamplet is called the "Rapid Transit Handbook." Mr. Mitten's conclusions follow:

Higher fares discourage increased riding and interfere with the extension of home building areas, thus nullifying the main justification for use of municipal funds in aid of added transit.

Inability to collect sufficient revenue in fares to meet costs of operation, and in addition pay the interest on city investment, makes necessary the use of some other means to avoid overburdening city credit.

There being no inducement for further investment of private capital, municipal funds, or those secured through assessment of benefited property, must be depended upon for future transit development.

Subway and elevated lines relieve surface street congestion to advantage of general vehicular and pedestrian traffic. This, with increased values of public or other property, not subject to special assessment for added transit would justify general taxes bearing a share of the costs of rapid transit developments.

Failure to assess some portion of the costs of added transit upon property owners who are specially benefited, exhausts the city's borrowing capacity and thus prevents property owners from getting other improvements to which they may be properly entitled.

Liberal treatment of earlier investment is justified because of the risks taken by original pioneers in developing transit; but a continuation of the present plan of building subways benefiting private property, which takes no risk whatever, is without any such justification.

A commission of public spirited citizens, representing the real estate and commercial interests, could, in co-operation with the city and the company, together best plan for added transit.

According to Mr. Mitten Philadelphia's future depends largely upon proper development of adequate transit. He says the city and company should co-operate to provide a satisfactory system, deriving every possible benefit from knowledge gained by experience in this and other cities.

Philadelphia increased the fare from 5 cents to 7 cents cash—four tickets for 25 cents—Nov. 1, 1920. In 1921 75,000,000 fewer passengers were carried; that is, 835,000,000, against 910,000,000 in 1920.

According to Mr. Mitten the greatest loss of passengers has been in the best paying class—the short riders. He says that passengers using free transfers continue to ride, but their fares seldom pay the cost of the service. Passengers carried in Philadelphia in 1920 increased 36 per cent as compared with 1916. Brooklyn, the system nearest approximating Philadelphia in size and conditions, showed during this period increased riding of but 12 per cent. Philadelphia, with increased fare, in 1921 carried 8 per cent fewer passengers than in 1920. Brooklyn, with fare unchanged, showed increased riding of 8 per cent.

Mr. Mitten says that New York and Chicago are likewise fairly comparable with each other. Chicago, with increased fare, in 1921 carried 2 per cent fewer passengers than in 1920. New York, with fare unchanged, showed increased riding of 5 per cent. Boston, in 1921, with a 10-cent fare, carried 12 per cent fewer passengers than in 1917 with a 5-cent fare.

New York and Brooklyn, with the basic 5-cent fare unchanged, says Mr. Mitten, show increased riding, but cannot meet expenses. Philadelphia, Chicago and Boston, with increased fares, show heavy loss in passengers carried, and have not increased their revenue sufficiently to justify the expectation that further increase in fares would be followed by a sufficient increase in revenue to pay interest on added investment required to perfect the service.

In continuing Mr. Mitten says:

Reduced Rentals

Philadelphians have been persuaded to the belief that much is to be expected from a decrease in the rentals paid by P. R. T. under lease to the underlying companies. To secure a proper perspective, one must understand that the city itself admitted, in the testimony of its director of city transit before the Public Service Commission of Pennsylvania in 1918, that $129,000,000 of capital was actually paid in. This sum should not be construed as being the full total of the investment made by underlying companies, as they are known to have enlarged property out of earnings, neither do their fixed capital accounts represent the various necessary structural overhead costs sanctioned by the commissions and courts. Furthermore, this sum shows no recognition of substantial sums paid by underlying companies to consolidate competing lines into a unified system.

The Public Service Commission, before whom valuation proceedings are now being conducted, cannot deal with the question of underlying rentals, but must, under the law, base its conclusion as to the rate of fare, upon the present value of the used and useful property.

Reducing the cost of providing transit, by decreasing the rentals or other form of return now being paid to underlying companies, has many advocates. Justice, however, prompts the recollection that original pioneers in early transit made no such profit from street railway investment as did those who invested in property abutting street railway lines.

City growth to present areas, and city's great advantage by increased taxable values, are both in large measure due to pioneers of street railway development, who successively scrapped horse cars, cable cars and the original four-wheel trolley, in favor of improved method and larger cars. This ladder, upon which cities climbed to their present status, cannot in fairness be thrown down without a reasonable consideration of the equities involved.

The Philadelphia Rapid Transit in 1907-8 started its Market Street subway-elevated line, and in 1919, according to Mr. Mitten, was more than $5,000,000 short of having earned 6 per cent upon the actual money invested, while the city advantaged by $113,000,000 abnormal increase in West Philadelphia taxable values alone. Owners of abutting property also secured great advantage from increased values, without contributing to the cost.

Philadelphia has appropriated to city transit construction the following designated and ear-marked items:

Frankford elevated		$15,000,000
Broad Street subway	$28,000,000	
Delivery loop	7,600,000	35,600,000
Byberry surface line		1,200,000
Darby elevated		4,200,000
Parkway-Roxborough subway-elevated		7,500,000
Chestnut Street subway		5,000,000
Real estate and sewers		2,700,000
Total appropriation		$71,200,000

Expenditures to March 31, 1922, from loan and general funds, have been as follows:

Frankford elevated		$9,102,745
Broad Street subway	$3,641,225	
Delivery loop	1,578,637	5,219,863
Byberry surface line		382,127
Sewer relocation		489,014
Real estate		491,460
Deficiency items		336
Salaries, office expenses, etc.		1,142,594
Carrying charges (interest and sinking fund)		4,184,714
		$21,012,854
Contracts placed or pending		5,900,000
Total expenditure		$26,912,854

Mr. Mitten says that this idle investment has already cost the taxpayers of Philadelphia more than $4,000,000 in interest and sinking fund charges. He says that city investment in transit should not be increased without a definite plan for financing additional high-speed lines, since none of those to which the city is now committed, can be made to earn interest on construction costs. He then goes on:

Greater New York's borrowing capacity does not permit of any material expenditure for added transit. Interest has been earned only upon the relatively small city investment of $59,000,000 in original subways, but on the $230,000,000 in new subways there is an accumulated deficit of $44,850,000. New York City taxpayers must bear the shortage, which for 1921 exceeded $9,500,000.

Boston, with $43,000,000 of public money invested in transit, for three years, showed a deficit of about $5,000,000.

Philadelphia should take advantage of that most important element left out of account in Boston and New York and make the property owner pay, into the public treasury, some portion of his profits from transit development, to help pay for its cost.

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COMPARATIVE RESULTS

Showing, in the case of Philadelphia and Chicago, decreased traffic following increased fare, as compared to well sustained annual increase in passengers carried at Brooklyn and New York with fares unchanged.

TOTAL PASSENGERS CARRIED

Philadelphia (Fare Increased in 1920)		Brooklyn (Base Fare Unchanged)
670,000,000	1916	765,000,000
910,000,000	1920	855,000,000
835,000,000	1921	920,000,000
Increase 36 per cent	1920 over 1916	Increase 12 per cent
Decrease 8 per cent	1921 over 1920	Increase 8 per cent
Chicago (Fare Increased in 1920)		**New York (Base Fare Unchanged)**
1,390,000,000	1916	1,480,000,000
1,540,000,000	1920	1,705,000,000
1,515,000,000	1921	1,785,000,000
Increase 11 per cent	1920 over 1916	Increase 15 per cent
Decrease 2 per cent	1921 over 1920	Increase 5 per cent

CITY PAVING

Cleveland, Ohio, by many considered the best example of service-at-cost plan, now requires abutting property to share the cost of surface street railway extensions. Cleveland has, for some years past, endeavored to relieve its street railways of paving costs and other taxes, in an effort to secure adequate service at minimum cost.

Costs of city paving and other forms of taxation should not be added to the cost of car rides under present conditions. City action is required to eliminate such items of expense, and also, by traffic regulation, to free street railway tracks from vehicular interference, and thus reduce delays and make possible the operation of additional cars, with a consequent larger percentage of seats supplied to number of passengers carried.

BENEFITED PROPERTY ASSESSMENTS

The City Club of New York, in a report based upon a survey of the aggregate rise in land values in Manhattan and the Bronx, found that the property owners benefited in the districts served could have paid the entire cost of the subway, $43,000,000, and still have had a profit on their increased land values of $37,500,000, created solely by the construction of the subway. City Club says:

"In view of this fact, would it not be reasonable to require property benefited in outlying districts to pay for the cost of a rapid transit line built to serve it?"

Mr. Mitten then quotes from the report of the Federal Electric Railways Commission to the President in August, 1920, in which that commission urged that in every community (where and to such extent as may be practicable) consideration be given to the advisability of requiring extensions and rapid transit systems of subway and elevated to be paid for, not out of new capital invested through the medium of bonds or stock (which means for all time an added burden upon the car rider) but from special taxes assessed against the owners of property in the district, the value of which is enhanced by such extensions. In commenting along these lines Mr. Mitten says:

Legislation defining city-built transit as a local improvement, the cost of which may be assessed upon property benefited thereby, was written into the rapid transit act of New York State by the amendment of 1909.

Pennsylvania's Commission on Constitutional Amendment and Revision adopted a provision by virtue of which all property benefited may be assessed to pay the cost of city-built transit. While the sanction to call the constitutional convention in Pennsylvania was denied by the electors at the 1921 primaries, there is an increasing sentiment that this principle of assessing cost on the property benefited should be written into the law, so that the municipality may build needed rapid transit lines, without overburdening general tax budgets to make up deficiencies in transit carrying charges.

San Francisco has successfully applied this principle. The Twin Peaks Tunnel project, involving an expenditure of about $4,500,000, was undertaken for the purpose of providing rapid transit to the southwesterly corner of the city, comprising approximately 4,000 acres of desirable home sites, otherwise practically isolated from the business section of the city by the Twin Peaks range of hills. The Bureau of Engineering, City of San Francisco, in a report dated July, 1921, states that the money for this entire project was provided by assessment on the property benefited.

The Board of Local Improvements of the city of Chicago in 1921 recommended the construction of a system of subways. Michael J. Faherty, chairman of the board, said:

"A subway in any district will result in the landlords boosting rents. The tenant will have to pay the increased rents whether subways are built by special assessment or in other ways. My plan is to make the landlord pay part of his increased income toward subway construction."

Mr. Faherty estimated that one-sixth of the additional income-producing power of benefited property would entirely pay for the subway.

One advantage of applying the principle of assessing property for benefits received, is that it acts as an automatic check to the demand for unwarranted extensions. If the land to be benefited is not able to stand the burden of any assessment, then it is evident that the development is premature.

MEN AND MANAGEMENT

Effective management is essential to satisfactory service. The law of Pennsylvania provides for reward of efficient management by authorizing participation in such resulting profits as shall be established before the Public Service Commission.

Men and management co-operating in Philadelphia, during the period 1911-1921, created added annual net income of $16,000,000, through patronage induced by developing the short riding habit, savings through increased production, elimination of waste and reduction in accident costs. During this period, rides per capita were doubled without increasing the number of men employed.

A TALE OF THREE CITIES

Showing how Philadelphia, 1910-1920, under Mitten management, compared, in results of operation and average rate of fare, with Brooklyn and Pittsburgh during the same period

Comparative Statistics, 1910	Philadelphia	Brooklyn	Pittsburgh
Gross operating revenue	$18,839,413	$20,906,930	$10,250,937
Operating expenses	10,156,013	11,726,392	6,092,028
Net operating revenue	$8,683,400	$9,180,538	$4,158,909
Taxes	1,582,336	1,454,213	427,128
Operating income	$7,101,064	$7,726,325	$3,731,781
Population	1,549,008	1,634,351	942,108
Total rides per capita	288	348	247
Average fare—total passengers, cents	4.13	3.60	4.32
Comparative statistics, 1920	**Philadelphia**	**Brooklyn**	**Pittsburgh**
Gross operating revenue	$38,807,354	$41,414,352	$21,322,503
Operating expenses	26,593,913	34,666,132	18,318,386
Net operating revenue	$12,213,441	$6,748,220	$3,004,117
Taxes	2,601,253	2,201,653	662,222
Operating income	$9,612,188	$4,546,567	$2,341,895
Population	1,823,779	2,018,356	1,094,809
Total rides per capita	501	447	293
Average fare—total passengers, cents	4.15	4.39	6.48

Co-operative accomplishment makes for good service. Commenting upon the then proposed contract with Pittsburgh Railways, Mayor Magee, formerly a public service commissioner, was quoted in Pittsburgh newspapers as saying:

"A clear cut provision should be added that will permit of a reward to the company for its efficiency, either due to decreased expenses or an increase in the riding habit of the public. . . . I look upon such a clause as being the most important, perhaps, of any that could be inserted in the contract. The revolutionary changes by the management of the street railways of Philadelphia have brought advantages to the car riders, because of wise management, that are so surprising as to be almost unbelievable."

Such a provision was embodied in the Pittsburgh contract, which is now in force.

Company Estimates Uniform

Time for Giving Decision on Toronto Arbitration Extended to Oct. 1—City's Side Being Presented

A synopsis of the evidence presented before the arbitration board in the Toronto (Ont.) Railway case by various experts as to the present value and the reproduction or replacement value of the railway's equipment has been published from time to time in the ELECTRIC RAILWAY JOURNAL. As a result of the application before the Appellate Court of Ontario by the counsel for the city corporation, some of the figures have recently been made public which were given by the different experts together with the cost as shown by the Toronto Railway's books, the court having granted the application by the city corporation for production of the figures.

Counsel for the city are now presenting their side before the arbitration board. It may be possible at a later date to give a summary of the evidence produced by the city's experts.

Appraisals have already been submitted by the company's experts. In each of these cases the valuations put in include all the assets of the company, while the city's experts are submitting appraisals of different portions of the assets like rolling stock, tracks, buildings, etc., which mean valuating on a different basis.

The time for making the award of the board, which was originally fixed for March 1, has been extended to Oct. 1, in order to enable the city corporation to complete its evidence.

Corporation Makes Its Annual Report to Commission

The Los Angeles Railway Corporation, operating in Los Angeles, has made its report to the State Railroad Commission for the year 1921, reporting that its operating revenue was $10,121,517 and operating expenses $8,232,577, giving a net operating revenue of $1,888,939; miscellaneous non-operating revenue amounted to $119,494. Interest, rent, taxes and other deductions totaled $1,788,005. The net corporate income for the year was $220,429. The deficit at the beginning of the year amounted to $975,014. Miscellaneous additions to the surplus of the company for 1921 amounted to $3,036, and miscellaneous deductions were $413,316.

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Railway Must Earn Its Way

The Tacoma Municipal Railway, serving the tideflats district, will have to earn its way hereafter or go out of business. This is the conclusion of City Attorney J. Charles Dennis, from the press reports of the decision of the State Supreme Court, handed down recently in the case brought by the citizens of Seattle to prevent the use of general fund money to pay any claims arising out of the purchase or operation of the Seattle street car system.

The Tacoma municipal line now owes the general fund $145,320 in loans made the railway operating fund in the past four years to cover interest charges. In addition, there was due at the first of the year $13,111 in interest on bonds for the payment of which no funds were available.

The court decision comes just in time to clarify the city's case in the matter of the U. S. Shipping Board loan on the municipal line, and City Attorney Charles Dennis has wired the Shipping Board of the court decision. When the Shipping Board loaned $223,000 to the city for double-tracking the tideflats line, the contract with the city contained a clause to the effect that 25 per cent of the receipts were to be set aside for interest and redemption charges and if this were not sufficient to meet the charges, the general fund should pay the difference. The Supreme Court, in the recent Seattle decision, has apparently nullified this clause, City Attorney Dennis states.

Discontinuance Application Heard

The Public Utilities Commission of Connecticut at Hartford, Conn., on May 17 heard the petition of the Connecticut Company for the discontinuation of the interurban service that operates between the cities of Hartford and Rockville for the major part over the steam tracks of the New Haven road.

President Lucius S. Storrs, representing the Connecticut Company, was commended for the position he took, when he announced that it was the desire of the company to act in accordance with the wishes of the community which the interurban serves. He further stated that economies effected by the discontinuance of the one line would result in improved service on the other—that of the surface lines so called.

Interesting Compilation Furnished Covering New Jersey Company

Robinson & Company, New York, N. Y., have compiled a fourteen-page booklet descriptive of the Public Service Corporation of New Jersey with particular reference to its common stock. A map showing the activities of the corporation in the railway, gas and electricity field is included. The data are complete with all details as to the corporation's management, field of operations, summary of securities, common stock dividend record and prospects, etc.

Some interesting statistics are given on the growth of the business since 1904. It is recorded that in 1904 the traction lines carried 165,400,000 revenue passengers, in 1910 258,746,130, and in 1921 348,284,712 revenue passengers were carried.

Financial News Notes

Loan for Extensions Hinted.—It is said that the Budget Committee of the Consul General of Paris, France, will issue a 400,000,000 franc loan ($80,000,000) for the extension of motor bus and electric railway lines in the suburbs of Paris.

New Company Will Take Over Railway.—The Mississippi Power Company has been chartered at Little Rock, Ark., to take over the railway and electric light company of Fort Smith, Ark. The capital stock is $1,700,000 and the officers are D. C. Green, president; George Sengel, Jr., vice-president; L. J. Noble, secretary, and R. D. Beard, treasurer.

New Issue Offered to Stockholders.—The stockholders of the Washington Water Power Company, Spokane, Wash., have been offered the right to subscribe to the extent of 10 per cent of their holdings to a new issue of stock. The amount of the new issue of capital stock is $1,549,000 and the proceeds will be used for capital expenditures already made or to be made this year. The regular quarterly dividend has been declared payable July 15 and all of the stockholders of the company using their subscription rights on or before June 20 will be entitled to the quarterly dividend on their additional holdings.

Capital Stock to Be Increased.—The stockholders of Tampa (Fla.) Electric Company have voted to increase the capital stock of the company from $2,879,800 to $3,454,800. Each stockholder of record on May 5, 1922, is offered the right to subscribe at $100 per share for one-fifth of a share of new capital stock for each share of capital stock standing in his name on the books of company at close of business on that date. Payment for stock subscribed for must be made in full at $100 per share on or before June 1, 1922, or at the option of the subscriber in two installments, $50 per share on June 1, 1922, $50 per share on Nov. 16, 1922.

Reorganization Plan Modified.—The plan for the reorganization of the San Francisco-Oakland Terminal Railways, San Francisco, Cal., has been modified by the reorganization committee and if approved by security holders will become operative thirty days after acceptance. The modified plan provides for elimination of tide lands, refunding of Halsey notes by subsidiary of new company to be organized, refunding issue to mature in fifteen years; one share of new common stock will be offered for four shares of old preferred instead of one share of new common for two shares old preferred as in the original plan. A board of fifteen directors chosen from the different groups of security holders will be created and voting power will be placed in the hands of a trust, where it will remain lodged for a fixed time for the benefit of stockholders.

Conspectus of Indexes for May, 1922

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	May 1922 **7.14**	April 1922 **7.14**	May 1921 **7.24**	May 1921 **7.24**	**4.84**
Street Railway Materials*	April 1922 **157**	March 1922 **156**	April 1921 **175**	Sept. 1920 **247**	**100**
Street Railway Wages*	May 1922 **213**	April 1922 **213**	May 1921 **227**	Sept. 1920 **232**	**100**
Steel Unfilled orders (Million tons)	Apr. 30 1922 **5.10**	Mar. 31 1922 **4.49**	Apr. 30 1921 **5.85**	Apr. 30 1917 **12.18**	**5.91**
U.S. Bank Clearings Outside N. Y. City (Billions)	April 1922 **11.68**	March 1922 **12.26**	April 1921 **11.59**	March 1920 **18.54**	Av. Mo. 1913 **6.12**
Business Failures Number	April 1922 **1,948**	March 1922 **2,317**	April 1921 **1,410**	Jan. 1922 **2,722**	Av. Mo. 1913 **1,213**
Liabilities (millions)	**72.55**	**57.51**	**51.05**	**105.7**	**24.64**

	Latest	Month Ago	Year Ago	Peak	1913
Eng. News-Record Construction costs	May 1922 **164.6**	April 1922 **164.7**	May 1921 **210.8**	June 1920 **273.8**	**100**
U.S. Bur. Lab. Stat. Wholesale Commodities	April 1922 **152**	March 1922 **152**	April 1921 **154**	May 1920 **272**	**100**
Bradstreet's Wholesale Commodities	May 1 1922 **11.70**	Apr. 1 1922 **11.53**	May 1 1921 **10.82**	Feb. 1 1920 **20.87**	**9.21**
Dun's Wholesale Commodities	May 1 1922 **168.1**	Apr. 1 1922 **166.3**	May 1 1921 **166.7**	May 1 1920 **263.3**	**120.9**
U.S. Bur. Lab. Stat. Retail food	April 1922 **139**	March 1922 **139**	April 1921 **152**	June 1920 **219**	**100**
Nat. Ind. Conf. Bd. Cost of living	April 1922 **154.8**	March 1922 **154.7**	April 1921 **167.6**	July 1920 **204.5**	(1914) **100**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over, except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on street and interurban railways in the United States.

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Traffic and Transportation

Lower Fare Discussed

Mayor-Elect of Seattle Favors Reduction in Fare—Ways of Accomplishing Change Paramount in City Affairs

The first subject of discussion among city officials of Seattle, Wash., is that of a possible reduction in fares, the proposed fare to be 5 cents, if such a reduction is possible. The present fare on the lines of the Seattle (Wash.) Municipal Railway is 8⅓ cents, if tokens are purchased, or 10 cents cash, both fares having transfer privileges. In view of the fact that Mayor-elect B. J. Brown has announced that his first consideration after he assumes office on June 5, with a newly organized City Council, will be the reduction in fares and the expressed statement of every member of the City Council approving a return to the 5-cent fare in the city, the subject is bound to become paramount in city affairs.

CITY WANTS ADVICE

Corporation Counsel Walter F. Meier has been asked by Councilman-elect E. L Blaine for an opinion on some of the possible legal consequences should a lowered fare be undertaken, and Mr. Meier, in his opinion, declares that reduction in costs of maintenance and operation is the only way open to reduce car fare, which, he states, cannot be effected either at the expense of the bondholders or the taxpayers. In his opinion, Mr. Meier held that the railway contract does not admit of a foreclosure, but does admit of a receiver's sale in case of a proved violation. This would not revive the franchise formerly held by the Stone & Webster interest, except by consent of the City Council.

Mayor Hugh N. Caldwell, a former corporation counsel of the city, asserts that the fare reduction can come only through revision of the contract with the Stone & Webster interest.

The Mayor said the situation would eventually result in the contract revision on more equitable terms, the turning back of the system to the original owners, or the appointment of a receiver to handle the railway's affairs. The Mayor advocated a return to the jitney bus transportation in competition with the railway, which he said would help to bring the bondholders to terms, and urged that no steps be taken to exceed the letter of the contract, and that no more be done to solve the railway's problems "more than is absolutely necessary under the contract."

In the meantime, Councilman C. B. Fitzgerald has announced his intention of introducing at the first meeting of the new Council a fare-reduction bill, providing for a straight 5-cent fare on all lines, and that the matter of a charge for transfers and the installation of economies which will make the reduced fare possible will be left to the railway department and the Mayor as administrative officials.

In the meantime, D. W. Henderson, superintendent of the municipal railways, is working out plans for every possible reduction in the operating costs of the railway. Along this line, he is endeavoring to increase the number of one-man cars on the railway lines to effect further savings. As an experiment in the conversion of old equipment to conform to the one-man car plan, Mr. Henderson has just had one of the single-end cars made over into a one-man car. The street railway has twenty-seven cars of the type remodeled, and if it proves satisfactory, the other twenty-six will be remodeled. This will increase the number of one-man cars, which now number 30 per cent of the equipment, according to Mr. Henderson. As a method of reducing operating costs, Mr. Henderson has made the statement that he prefers the plan of increasing one-man cars to that of reducing salaries of the railway operatives any further.

Talk of Fare Compromise in Louisville

Ever since the United States Circuit Court of Appeals handed down its decision sustaining the injunction granted by Judge Evans, restraining city officials from interfering with the Louisville (Ky.) Railway in collecting a 7-cent fare, there has been talk of a compromise. According to Clayton B. Blakey, city attorney, the next move in the case rests with Judge Evans, unless a compromise is agreed upon.

Procedure in the case in the absence of a compromise, according to Mr. Blakey, will be to try it out on its merits, which will involve the taking of testimony as to valuation of property, income and expense.

Mayor Quin is reported to have said that he would consider a compromise of 6-cent fare should one be offered by the company. He said also that any other offer or suggestion made by the railway regarding a settlement of the case would receive consideration.

Commission Dismisses Suit

As a result of the Knoxville Railway & Light Company and the city of Knoxville, Tenn., filing a petition with the State Railroad & Public Utilities Commission asking that their appeal to the Supreme Court be dismissed, the fare in Knoxville will remain at 6 cents. This step ends a long controversy which has been raging since early last year, when the Knoxville Railway petitioned for a 7-cent fare with 2 cents additional as a transfer charge. The commission at that time ordered an appraisal of the property upon which it allowed an increase in fare from 5 cents to 6 cents. The city was opposed to the higher fare order. The decision of the commission was reviewed at length in the ELECTRIC RAILWAY JOURNAL, issue of July 9, 1921.

Electric Railways Excluded

Interstate Commerce Commission Holds No Reduction in Charges of These Companies Is Warranted

Reductions equivalent to 10 per cent on all freight rates were ordered in an opinion handed down by the Interstate Commerce Commission on May 24. The commission found:

1. That on and after March 1, 1922, a fair return upon the aggregate value of the railway property of the carriers defined in Section 15A of the interstate commerce act, determined as therein provided, will be 5.75 per cent of such aggregate property value, as a uniform percentage for all rate groups, or territories designated by this commission.
2. That the existing freight rates and charges including charges for switching and other accessorial services and all other charges applicable to freight service, which were increased by authority of "Increased rates 1920, *supra*," will be on and after July 1, 1922, unjust and unreasonable to the extent that they may respectively include more than the following percentage of increase over the rates in effect immediately prior to Aug. 26, 1920, in and between the various rate groups as defined in "Increased Rates 1920, 58 I. C. C. 220, 489," and "Authority to increase rates, 302."

In the Eastern group, also between points in Illinois territory and between Illinois territory and the Eastern group, 26 per cent instead of the 40 per cent authorized in the decisions last cited.

In the Western group, and between the Western group and Illinois territory, 21.5 per cent instead of the 35 per cent so authorized.

In the Southern and Mountain-Pacific groups, 12.5 per cent instead of the 25 per cent so authorized.

On interterritorial traffic, except as otherwise provided herein, 20 per cent instead of the 33⅓ per cent.

The opinion carries the following reference to electric railroads:

The only evidence as to the rates, fares and charges of electric railroads was introduced in behalf of a national association of such carriers. This was substantially to the effect that most electric lines do not fall within the view of section 15A of the interstate commerce act; that while generally their freight rates and charges were increased pursuant to increased rates, 1920 *supra*, the authority thereby granted did not extend to passenger fares, and that no reduction in their charges is warranted at this time. This evidence stands uncontroverted upon the record.

In the case cited, we said at page 253: "Petitions have been filed in this proceeding by a national organization of electric lines, seeking permission to increase their rates in the same proportion as the rates of trunk lines are advanced. The operating costs of these lines have, on the whole, increased in approximately the same ratio as those of steam railroads. In some instances, there is competition between the electric lines and the steam railroads. We conclude that the freight rates of electric lines may be increased by the same percentages as are approved herein for trunk lines in the same territory. This is not to be construed as an expression of disapproval of increases, made or proposed in the regular manner, in the passenger fares of electric lines."

Thereafter, many passenger fares were increased by electric lines in the same proportion as those of steam lines. On the whole, these carriers have had substantially the same relief as the steam carriers. The influences affecting their charges are much the same, and it would seem that they should receive like treatment. But the evidence is too meager to permit of specific findings as to individual electric lines, or electric lines as a whole.

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Commission's Suggestions Adopted by Connecticut Company

"Our experience with the operation of buses has shown that this type of service cannot be operated at as low a cost per passenger as the trolleys, but where the condition of the track or public betterment projects makes necessary a large expenditure for track renewal on non-paying lines, it is quite possible that such substitution may be a means of retaining a measure of service that would not be warranted under other conditions." These statements are contained in a letter written by Lucius S. Storrs, president of the Connecticut Company, to the Public Utilities Commission, in reply to the commission's recent ruling concerning passenger rates in Connecticut and the suggestion that motor buses be used where trolleys have never paid and are unlikely to pay.

The commission at that time informed the company that the present rates of fare, except in the test case areas, would be permitted to stand despite a number of petitions for fare reduction from various parts of the State. The commission, however, called attention to the fact that it reserved jurisdiction over the pending cases and would decide later whether the present fare rates would bear changing.

President Storrs replied that the commission's suggestions for modification of present tests has been given careful consideration by the directors.

"A careful survey of the property will be made to determine the possibility of such substitution," he said concerning the suggestion to establish increased motor bus transportation on non-paying lines.

"It is our opinion that the ultimate interests of the communities and the company can be best served if the same rate of fare is applied to the entire property.

"In Bridgeport the results of the test thus far conducted show conclusively that the present method is not providing as much revenue as was obtained during the period immediately prior to its inauguration and the receipts fall far short of meeting all items of the cost of service.

"We will accept your suggestion as to the modification in the Norwich test area."

Beginning May 21, metal tickets, obtainable at three for 25 cents, were acceptable in payment of fare on that part of the Bridgeport system where the initial payment has been 10 cents.

Houston Disputes Car Removal

A controversy has arisen in Houston, Texas, over the question of removing the cars from Main Street, as proposed by Mayor B. E. Holcombe and agreed to by the officials of the Houston Electric Company. Acting on this agreement, the traction company has built a double track line on Fannin Street, which parallels Main, and the cars that had formerly used Main Street are being rerouted on Fannin and other streets on which tracks already were built.

Merchants along Main Street divided on the question, one faction favoring the removal of the cars and the other opposing. Both sides have prepared petitions for presentation before the City Council. Already three car lines have been rerouted, leaving four lines still on Main Street. These lines are awaiting the completion of a single track one block long from Fannin to Capitol Avenue.

The new tracks have been laid by the Houston Electric Company at a cost of $125,000. It was agreed that the cars would be removed from Main Street for a period of one year as an experiment to determine if the patrons really wanted the change. The traction company agreed not to remove its tracks from Main Street during this test but to cover then with asphaltum, and at the end of a year, if the patrons wanted the cars back on Main Street, they would be put back without undue cost.

It now looks as if court action may be resorted to by one or the other faction.

Hearing on Equalization of Fares Held

Further hearing on application of the United Traction Company, Albany, N. Y., for equalization of its fares discloses that receipts exceed the estimate of the United Traction Company. Actual revenue from operation showed an increase of 17 per cent over the amount the company estimated it would receive from the operation of its lines during the first four months of this year, Davis L. Waters, auditor of the company, testified before the Public Service Commission at a hearing on the order of the commission for further testimony about finance held on May 19. The testimony is closed and a decision is expected soon. Chairman William A. Prendergast conducted the hearing. Expenses of the company over the period amounted to 8 per cent over the amount previously estimated.

It was brought out that, figured on a car-mile basis, the revenue in the Albany zone was 54 cents a mile, while the expense for actual operation was 36 cents. In the Troy zone the revenue was 42 cents and the expense 37 cents.

The company made application several months ago for an equalization of the fares charged in Albany and Troy. In the latter city 6 cents is charged, which also is the amount in Cohoes and Rensselaer. In Albany the rate is 8 cents.

Mr. Waters testified that the company would have to expend nearly $600,000 for new trackwork in Albany and Troy this year.

A. E. Reynolds, general manager of the company, testified that since the operation of one-man cars in Albany better service has been given the public. He also testified regarding the expense of operating the cars.

Free Transportation Largely Eliminated

Simultaneous with the taking over of the Detroit United Railway system by the Department of Street Railways, City of Detroit, an order was issued which eliminates a great part of the free transportation heretofore supplied in Detroit and commonly supplied by most companies. Henceforth in Detroit no one will be permitted to ride on a pass except conductors and operators in full uniform, police and firemen in full uniform, division supervising officials presenting instructor's badges and trackmen presenting trackmen's badges. Any employee whose work requires that he get out on the property will be provided transportation from his office to that point and return, but he must pay his fare when riding from home to work or at any time when not actually on company business.

All motormen of both one-man and two-man cars are henceforth to be called "operators," according to a recent order of the department.

Another change made in the organization of the municipal railway system in Detroit was the abolishment of the position of night superintendent of city lines. Under the municipal operation, each division superintendent will be responsible for operation of cars on his various lines and for the conduct of the personnel of night forces as well as day forces.

Lower Fare to Become Effective June 1

Instead of reducing its fare to 6 cents as of July 1 as arranged in the new franchise the Washington Water Power Company and the Spokane City Railways filed a new tariff with the State Department of Public Works which calls for a 7-cent cash fare and a 6-cent ticket fare to become effective on June 1. E. V. Kuykendall, director of the State Department of Public Works, stated that the department would waive the thirty-day period which must usually elapse before the filing of a new tariff and its going into effect. The universal transfer will not, however, become operative until July 1, when the consolidation of the two properties takes place.

General Manager Connors of the Spokane City Railways expressed his approval of the earlier date for the lower fare schedule. On this point he said:

> It will give our riders an opportunity to get accustomed to the new plan. I can see a bright future in store for the Spokane United Railways after consolidation and I am therefore more than pleased to help push the good work along by giving the people the benefit of the fare reduction sooner than they expected.

Preparing for One-Man Cars.—The Olean, Bradford & Salamanca Railway is preparing for operation of one-man cars in the city of Olean, N. Y. It expects to put its first car of this type into service in ten days and others will soon follow. Cars are now being reconverted for one-man operation.

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Interurban Service Extended Through Chicago

Since Feb. 15, 1922, the Chicago North Shore & Milwaukee Railroad has been operating its Milwaukee limited trains through the loop to Sixty-third Street and Woodlawn Avenue on the south side, providing an hourly service for south side business men and residents to and from Milwaukee and intervening cities. Similarly, the merchandise dispatch service of the company was extended from the loop south and receiving stations located at Sixty-third Street and Calumet Avenue and Forty-first Street and Union Avenue at the Union Stockyards. This extension of the services of the company over the elevated structure to the south side of the city gives this section the same high grade service that is afforded to passengers boarding and leaving the trains in the loop or at north side stations.

The extension of the service adds about twenty-five minutes to the running time of each limited train, but inasmuch as there was formerly a layover for each limited of fifty-five minutes, it was possible to extend the service with but little additional cost.

As a result patronage of the through service to the south side is increasing steadily and it is felt by the officers of the company that in time it will add substantially to the patronage of the North Shore Line. It makes the railroad more useful to the community and tends to create new habits of travel, because of the convenience, which will bring much of the travel on the part of the south side people to cities north of Chicago to the North Shore Line.

While the elevated railroad gives a good service from the south side to the Loop, where the main Chicago terminal of the line has been heretofore, the North Shore trains give a de luxe non-stop service for which the passengers are willing to pay a higher rate of fare. The city is divided into three zones, so that it costs only 11 cents more for a Milwaukee passenger to ride clear through to the south side than it does to come only into Wilson Avenue on the north side. The straight mileage rate does not apply after the train reaches the elevated system in the city.

Fare Reduction Ordinance Repealed

The City Council of Little Rock, Ark., has repealed the ordinance requiring the Little Rock Railway & Electric Company to reduce its fares from 6 to 5 cents. One Alderman explained that the ordinance was ineffective because of the failure of the Council to give the company the necessary thirty-day notice, as required by law. The repeal of the ordinance, it is said, was requested by the attorneys having in charge for the city the public utility rate cases that are pending in the courts. A resolution was introduced by the public utilities committee notifying the railway that a hearing would be held in the Council chamber on the evening of June 26 to determine what will be a fair and reasonable charge for carrying passengers, and, providing the facts and evidence at the hearing justify, the rate charged will be reduced. The resolution was adopted.

Transportation News Notes

One-Man Cars Appear.—The Philadelphia (Pa.) Rapid Transit Company recently started the operation of one-man cars on the Jefferson and Master Streets divisions.

Will Contract for Tokens.—Joseph S. Goodwin, general manager of the Detroit (Mich.) Municipal Railway, has received authority to contract for 500,000 metal tokens to facilitate fare handling.

Five-Cent Fares to Continue.—The Lake Shore Electric Railway, Cleveland, Ohio, has abandoned its fight for higher fares at Sandusky. This means 5-cent fares will continue, six tickets for a quarter and free transfers.

Warning Autoists.—The police of Trenton, N. J., are distributing circulars to autoists warning them to be careful when pulling from a curb to prevent being struck by a trolley car. The majority of the trolley-auto crashes are due to careless autoists.

An "Exciter" Comes from Pine Bluff.—The Pine Bluff (Ark.) Company, in conjunction with the Arkansas Light & Power Company, recently began publishing a small weekly house organ, called the "Exciter." The little magazine contains personal and other items. It is edited by A. G. Whidden, in charge of publicity for the companies.

$1.25 Weekly Pass for Fort Smith.—The Fort Smith Light & Traction Company has received permission from the Arkansas Railroad Commission to increase as of May 29, its cash fare from 6 to 7 cents and to install a weekly pass at $1.25. The latter will be of the transferable, unlimited-ride type now in use at Racine and Kenosha, Wis.; Youngstown, Ohio; New Brighton and Meadville, Pa.; Fort Wayne and Terre Haute, Ind.

Rewards Offered for Service Suggestions.—To encourage trainmen in making suggestions for the betterment of service, the Los Angeles (Cal.) Railway has announced that monthly cash prizes will be given for the best ideas. Only trainmen engaged in actual operation of cars will be allowed to participate. For the best suggestion in any calendar month, $7.50 will be given, $5 for the second best and $2.50 for the third best. The plan was put in effect May 1.

City Appeals from Ruling.—An appeal was filed recently by the City Solicitor of Scranton, Pa., against the ruling of the Public Service Commission continuing the 8-cent fare on the lines of the Scranton Railway for another six months. The city contends that the commission acted without serving proper notice upon the city and the public. The appeal was filed in the Superior Court of Allentown and the first Monday in October was set by Judge Trexlen as the day for hearing the argument.

Will Increase One-Man Cars.—So satisfactory has the one-man car system proved on a number of lines of the Springfield (Mass.) Street Railway that it is planned to add a number of lines to the one-man car list this season. Preparatory to this extension between twenty and thirty cars of the double-truck type are being made over into one-man cars, as these cars have the preference over the small one-man cars, first introduced. At present there are three day lines and three all-night lines operating in Springfield on the one-man basis. All the company's Westfield lines, except those running between Westfield and Springfield, have the one-man car service.

Uncertain Outlook Emphasized.—In a conference with the executive committee of the Holyoke Chamber of Commerce, on May 15, relative to a suggestion that the Holyoke (Mass.) Street Railway reduce its rates or extend its zone limits, President Louis D. Pellissier said that he deemed any reduction at this time as ill-advised. He said that while the company last year paid a dividend of approximately 6 per cent on the par value of the stock, the average price paid by the stockholder was $120 a share, so that the dividend really amounted to only 5 per cent. He explained that the total revenues in 1921 were $11,000 less than in 1920 and the passenger revenues $28,000 less, while the outlook for the future was uncertain.

Freight Rights Granted.—The town board of Port Fulton, Ind., in the southern part of the State, has adopted an ordinance granting the Interstate Public Service Company an amended franchise for the use of the streets of the town by removing the restriction on hauling freight, which under the old franchise might be handled only between the hours of 8 p.m. and 6 a.m. The removal of the restrictions is in order to aid the building of rail-river terminals in which the Interstate will co-operate with the Inland Waterways Company, which will handle the water end of the traffic while the Interstate will handle the rail end. The Interstate will give connections to freight hauled either by steam or electric road and the branch to be laid to make the necessary connection will be considerably less than a mile long. The companies have options and will buy the land on which the Ohio River terminals will be built.

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Personal Mention

Canadian Officers Prepare for Meeting

G. Gordon Gale, Thomas Ahearn, George Kidd, F. D. Burpee and Arthur Gaboury Are Hosts for Canadian Electric Railway Association

AGAINST the background of the Canadian Electric Railway Association five men stand out as does the aurora borealis against the Canadian sky. These five men—G. Gordon Gale, Thomas Ahearn, George Kidd, F. D. Burpee, and A. Gaboury—will guide the meeting of the association in Quebec on June 1, 2 and 3, and cram into those three days a variety of important railway matters. The brilliance of display will be apparent then—the evidence of months of painstaking planning.

MR. GALE LEADS

G. Gordon Gale, president of the Canadian Electric Railway Association, will act as chief master of ceremonies. Mr. Gale is vice-president and general manager of the Hull (Que.) Electric Company, as every one in the industry knows. His promotions read like steady steps leading to his present post of responsibility and honor, for the notices say: "Mr. G. Gordon Gale appointed acting general superintendent of the Hull Electric Company; Mr. Gale appointed general superintendent of the Hull Electric Company; Mr. Gale appointed manager; Mr. Gale appointed vice-president." And most of this time Mr. Gale has been chief engineer of the company at Hull. Those changes are logical, and they sound easy. They were for Mr. Gale, else he would never be where he is when he is. His association with the Hull Electric Company began in 1907. Before that, Mr. Gale was assistant engineer of the electrical plant of the Canadian Rubber Company. He is a graduate of the electrical engineering department of McGill University.

Mr. Burpee, vice-president of the association, is manager and director of the Ottawa Electric Railway, and director of the Ottawa Traction Company. He joined the company in 1893 and five years later became assistant to the superintendent and secretary-treasurer. In 1912 he took over the duties of superintendent, and held that position, with the exception of the war period, until 1920. In that year he was appointed general manager.

In the post of treasurer is Arthur Gaboury, superintendent of the Montreal Tramways. His work in railway associations has been active and extensive. In 1919 he was elected president of the Canadian Association, and during that year he served on the executive committee of the American Electric Railway Transportation & Traffic Association. Mr. Gaboury began as conductor and motorman with the Montreal Street Railway, gaining there pointers on the practical side of transportation. He was successively assistant inspector in traffic handling, chief clerk at the St. Denis Street carhouse, claim agent, and assistant superintendent. In 1907 he was appointed superintendent.

MR. AHEARN A PIONEER

Mr. Ahearn, who is honorary president of the association, is known everywhere as the president of the Ottawa Electric Railway, and one of the leaders in the construction of that railway, which was the first in Canada. Building a railroad is far simpler than making it run, and run successfully. Mr. Ahearn did both, and thereby solved the problem of operating an electric service on wheels throughout the Canadian winter. For many years Mr. Ahearn was active in the construction of electric works, and was vice-president of Ahearn & Soper, Ltd., electrical engineers and contractors. Shortly after entering business, Mr. Ahearn was manager of the Bell Telephone Company at Ottawa.

George Kidd, general manager of the British Columbia Electric Railway, is serving once more as honorary vice-president of the Canadian Electric Railway Association. He was trained in accountancy and accepted a post with Mellors, Basden & Mellors, chartered accountants, Nottingham, England. In 1907 he was appointed secretary of the British Columbia Electric Railway, with his office in London, England. In 1911 he was made comptroller of the company and removed to Vancouver, B. C., and in May, 1914, received the appointment of general manager of the company, which position he now holds. The British Columbia Electric Railway represents an investment of $60,000,000 in and around Vancouver and Victoria, controlling the electric railway, light, power and gas systems in these centers.

T. AHEARN G. KIDD G. G. GALE F. D. BURPEE A. GABOURY

One of the most recent accomplishments of Mr. Kidd was the acquisition of the Western Power Company of Canada, which system has now been amalgamated with the mainland system of the British Columbia Electric Railway. A $10,000,000 water power development scheme is being planned on Stavex Lake, where the Western Power Company's present generating plant is situated.

Major Henry Mattison, chief civil engineer for the Manchester (England) Corporation Tramways, has been appointed general manager of the undertaking, in succession to J. M. McElroy, retired through ill health. Mr. Mattinson has been connected with the Manchester tramways for twenty-one years and has been chiefly responsible for the construction of almost the whole of the present 220 miles of single track. During the war he carried out much railway construction and reconstruction work in Syria.

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G. D. Baker—Owner and President

New Leader of Springfield & Washington Railway Co-operates With Bus Line in Restoration Plans

George D. Baker, who recently was elected president of the Springfield & Washington Railway, South Charleston, Ohio, after purchasing the road from the other heirs of his father, George W. Baker, is known as one of the liveliest business men in central Ohio. In addition to his traction interests, he is also owner of a railroad tie producing business. Its extent may be realized when it is known that he but recently installed a $200,000 plant in Washington Courthouse for the chemical treating of ties to preserve their life.

Takes Over Line

Mr. Baker took over the Springfield & Washington line shortly after application had been made by the former owners to the Public Utilities Commission to discontinue the road because of poor business and loss of revenue. The line operates between Springfield and South Charleston. Originally, it was intended to extend the line from Springfield to Portsmouth, but when the tracks were laid to South Charleston the backers ran out of funds and the company halted its extension efforts.

Mr. Baker took the line over in the belief that through proper management and reduction of operating expense the properties could be made a paying investment, and traction men in the middle West are watching his moves with extreme interest in the belief that some of his ideas may be applicable to their own lines.

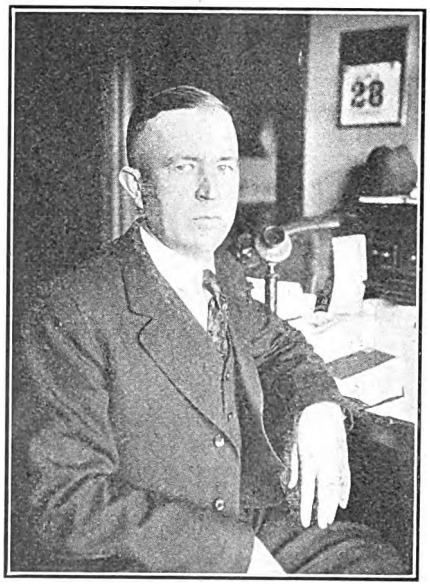
One of the first steps taken by the new owner of the line was to perfect an agreement with the Flag bus line, which had been operating buses between Springfield and Washington Courthouse, whereby the buses were to be operated between South Charleston and Washington Courthouse only, thereby serving as a feeder for the traction line. In return, a through rate agreement was made so that Springfield passengers would make the trip from South Charleston to Washington Courthouse via the bus line.

Plans to Install Additional Bus Lines as Feeders

Within the next few weeks other bus lines, owned by the traction line, will begin operating from various points to connect with the road and serve as additional feeders. Another step planned is the removal of the Springfield station to a point where the rental will not be so high. Night carrying of freight in order to make the traffic carry through twenty-four hours a day is also contemplated. Mr. Baker also has a number of other ideas "up his sleeve," but these he declines to reveal until he has been given an opportunity to test their soundness.

Construction of the Springfield & Washington Railway was started originally by a company known as the Springfield, Charleston, Washington & Chillicothe Railway. George W. Baker, father of the present owner of the line, was at that time in the tie business at Washington Courthouse and furnished most of the ties for the line. He became one of the heaviest creditors, and when the road failed some time later, he took over the properties and organized it as the Springfield & Washington Railways. When the father died in 1914, the son, George D. Baker, took over the tie business and the road was operated by the other heirs, with Floyd Baker as general manager. The road began to show deficits in 1921 and early this year an application was filed with the State to discontinue the line. It was then that Mr. Baker stepped in and purchased the company and reorganized its affairs.

The new officers of the company are: George D. Baker, president; W. W. Keifer, vice-president; W. F. Gangwish, secretary, and C. J. Baughn, treasurer.



G. D. Baker

The new owner has secured the co-operation of the Chamber of Commerce in Springfield and Washington Courthouse and these organizations have pledged themselves to assist in every way toward making the road a financial success. Those who are acquainted with Mr. Baker, however, say that developments will show him to be making most of the suggestions and doing the real work of placing the road on its feet. It is easy to see that Mr. Baker has established a reputation for progressiveness and that he will hold it in his new work.

M. F. Ryan, who has been with the Philadelphia (Pa.) Rapid Transit Company for fifty years, was honor guest at a banquet in celebration of his long service. He was a conductor for some time, and later was made superintendent of surface lines.

Obituary

John Q. Ross

John Q. Ross, a member of the board of directors and for several years president of the Muskegon Traction & Lighting Company, died at his home in Muskegon, Mich., on May 12. Mr. Ross was only forty-eight years old. He was very prominent in his home state, where for two terms he served as Lieutenant-Governor.

Mr. Ross played an important part in the life of the Muskegon Traction & Lighting Company during the last few years. He brought about a reorganization of the local management of the company two years ago, with the result that the American Light & Traction Company, the parent company, placed George Steinwedel in charge as president and general manager at Muskegon. Mr. Steinwedel shortly afterward reorganized the entire personnel of the company. Mr. Ross then resigned as president, but continued as a director.

Mr. Ross was a lawyer, but quit active law practice a few years ago to look after his industrial interests. He was president or a director of more than a score of Muskegon industries.

John F. Stephens, member of the board of trustees of the Boston (Mass.) Elevated Railway, died in Roxbury, Mass., May 11.

Charles J. Smith, division superintendent of the Dorr carhouse of the Community Traction Company, Toledo, Ohio, died May 20. He started as a conductor with the company twenty-five years ago.

Frederick G. Wisell, chief draftsman in the engineering department in Seattle, Wash., of the Puget Sound Power & Light Company, died April 22. He did some work for the company at Snoqualmie Falls in 1907, and later that year became a draftsman in the Seattle office. In 1914 he was transferred to the engineering department, and two years later, when the engineering forces of the company were consolidated, he was made chief draftsman.

Clayton E. Dutot, timetable maker for the New York Consolidated Railroad, which operates the subway and elevated lines of the Brooklyn Rapid Transit system, died at his home in Brooklyn, on May 10. He had been with the Brooklyn Rapid Transit Company for more than twenty-one years and was an expert in the making of schedules and run sheets. Mr. Dutot entered the employ of the Brooklyn Rapid Transit Company as agent and operator. He was made train clerk in 1903. The following year he was promoted to the position of dispatcher, and in 1908 was assigned to the timetable department, where he remained up to the time of his death.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

$300,000 for Power Improvements

Five New Automatic Substations Are Included in Program of United Railways, St. Louis

Contracts have just been let for five new automatic substations in St. Louis. Owing to the increased number of cars operated, the receiver of the United Railways found it necessary to increase materially the power facilities of the system. At the present time more cars are being operated than ever before—about 1,360 at the peak hours—resulting in an overload on the present facilities, both transmission and converting equipment. As the majority of the power used is purchased power, principally from Keokuk Dam on the Mississippi River, the question resolved itself into additional transmission and converting equipment.

A contract has just been entered into for the purchase of four 1,000 kw. converters with the necessary automatic control equipment for two 2,000 kw. units at present on hand which will be moved from existing stations to new buildings. Requiring additional equipment on two of its County Lines, the company purchased apparatus of the automatic type and the experience with this equipment, together with the experience with other companies, led to the adoption of automatic apparatus for the new city stations as follows:

One 1,000 kw. station at Union and Maple Avenues (western portion of the city); one 2,000 kw. (two 1,000 kw. units) station at Taylor and Fairfax (central western portion of the city); one 2,000 kw. station at 7th and Franklin (downtown district); one 1,000 kw. unit at Broadway and Arsenal Street (eastern and semi-southern portion of the city).

The total approximate cost of the new substations will be $300,000, against which there will be a credit applicable on account of copper removed of from $25,000 to $40,000, depending upon the amount of copper it is finally decided can be dispensed with and the scrap value of copper at the time. The gross figure of $300,000 is divided approximately as follows: electrical equipment, installed, $185,000; transmission and distribution (practically all transmission), $60,000; land and buildings, $55,000.

Southern Pacific Lines Establish Tie-Treating Plant at Los Angeles Harbor

The Southern Pacific Lines have just completed and placed in operation at Los Angeles Harbor a new tie-treating plant, which provides for the employment of 100 men at the start. The new plant is under the management of Frank D. Mattos, and will handle and treat approximately 750,000 railroad ties a year. Green ties will be brought to the plant at Los Angeles Harbor via ships from the tie-producing points at northern locations on the Pacific Coast, and will be treated under the railroad's own process, namely, Rueping, before being placed in service. Douglas fir lumber is the type of tie treated under this process. Tie requirements of the Southern Pacific Lines are in the neighborhood of 3,000,000 ties a year. This process renders the ties serviceable for from fifteen to twenty years. This new plant is one of three controlled and operated by the railroad.

The Coal Situation

Prices of coal advanced last week an average of 51 cents. The volume of free coal is restricted, as the large non-union shippers are committed on their May output. Those who have coal for sale are the ones who are following a policy of getting the top of the market, selling from day to day and at most from week to week.

Efforts at Washington to hold the price down have but little affected market quotations; they have really introduced a general hesitation that may be the forerunner of an easing of prices. The meeting of non-union operators in Washington on May 31 will bring out more fully the plans of the Secretary of Commerce and the opposition of any who have no faith in such procedure. It is recognized that distribution plays an important role in controlling prices, and in this the jobber, who now is speculator as well, is a factor. He is the key to distribution for the great majority of small producers.

In the Middle West pooling of buying by railroads and other large consumers is holding the market in check. Speculators found that much of the tonnage which they have shipped in on consignment was not readily taken and some low figures were taken to dispose of these cars. This steadying influence has been exerted in the face of a distinctly bullish market.

New England and the Northwestern markets remain comparatively quiet. In the former, stocks are heavy and although the supply has been shortened, consumers are not eager to buy at the ruling quotations. The rising prices have caused rehandlers in that section to be more cautious about commitments. The Northwest has been stirred only slightly by the unusual orders placed with the docks at the Head-on-the-Lakes for shipment to Lake Michigan points and to distant rail destinations. Lake dumpings proceed at the rate of 250,000 to 300,000 tons weekly but much of this coal is being shipped to other lower lake points. *Coal Age* index of spot prices of bituminous coal increased 42 points to 303 on May 22. Spot prices are now at their highest point since late in 1920.

Westinghouse Sales for the Year, $100,000,000

In spite of the extremely adverse conditions of the past year, the sales of the Westinghouse Electric & Manufacturing Company amounted to almost exactly $100,000,000, as shown by its annual report, as of March 31, 1922. This is the largest volume of business handled by this company except during the abnormally active previous three years. Manufacturing costs were high, however, as these could not be reduced as rapidly as prices fell. Furthermore, the expense of development work and about $1,500,000 for depreciation of inventory were charged against manufacturing costs, so that the increase in surplus was only slightly greater than the amount paid out in dividends.

The excellent "cash position" of the company is shown by the fact that its current assets—including cash, U. S. securities, and accounts and notes receivable—total $41,700,000, while its current liabilities—accounts payable, dividends unpaid, and accrued interests, etc.—are only $11,400,000. In addition, the company possesses an inventory of $55,000,000.

Chairman Guy E. Tripp says in his report: "The contraction in orders booked continued throughout the year until January, 1922, when there began a substantial improvement which has since been maintained. In addition to the favorable indications for an increasing demand for the regular lines of the company's products, a large demand for radio telephone receiving apparatus has recently developed with a prospect of its continuance for an indefinite period. It should be pointed out, however, that the ensuing year promises to be a period of keen competition."

The income account for the year is as follows:

Gross earnings	$99,722,026
Cost of sales	93,461,846
Net manufacturing profit	6,260,180
Other income	2,673,808
Gross income	8,933,988
Interest on bond and notes	3,096,600
Net income available for dividends, etc.	5,837,388

Metal, Coal and Material Prices

Metals—New York	May 23, 1922
Copper, electrolytic, cents per lb.	13.75
Copper wire base, cents per lb.	15.00
Lead, cents per lb.	5.56
Zinc, cents per lb.	5.50
Tin, Straits, cents per lb.	30.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$7.375
Somerset mine run, Boston, net tons	4.125
Pittsburgh, mine run, Pittsburgh, net tons	....
Franklin, Ill., screenings, Chicago, net tons	....
Central, Ill., screenings, Chicago, net tons	....
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.75
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	96.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	97.00

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$8,000,000 for French Railway Electrification

The Locomotives and Esuipment to Be Furnished by French Representatives of International General Electric Company

The forward-looking policy of the French railroads in electrifying their main lines is evidenced by the recent definite action of the Paris-Orleans Railway, one of the six great systems of France. According to dispatches recently received, and as a part of the program for electrification with the 1,500-volt direct current system, selected after an exhaustive study of European and American experience, this railroad, which operates over 5,000 miles of route, has placed an $8,000,000 contract for eighty freight locomotives and eighty heavy high-speed passenger motor cars.

This equipment will be furnished by a group of French manufacturers headed by the Compagnie Francaise Thomson-Houston, representatives in France for the International General Electric Company. While the larger part of the order will be manufactured in France, considerable material of American manufacture, it is understood, will also be required.

The engines will be used on an extension of the original electrification made a quarter of a century ago by the French Thomson-Houston Company with General Electric apparatus. The first part of the new 1,500-volt section will cover 125 miles of dense main line traffic between Paris and Vierzon. The motor cars will replace and extend the present suburban steam service out of Paris.

The high-speed through-passenger service from Paris to Vierzon on the way to southern France will be served by 1,500-volt, direct-current electric locomotives weighing 250,000 lb. each and capable of regular running speeds between 80 and 85 miles per hour. While these machines are not included in the contracts thus far awarded, the railway company is expected to announce the placing of this business at an early date and to give consideration soon to the purchase of large numbers of additional locomotives for use on the 2,000 miles of its system in the central plateau region.

Rolling Stock

Long Island Railroad, New York, N. Y., has filed for approval with the Interstate Commerce Commission a certificate issue of $980,000 to enable it to secure forty steel motor passenger cars.

United Railways, St. Louis, Mo., has ordered fifty equipments from the Westinghouse Electric & Manufacturing Company for the cars now under construction in the railway company's shops. The motors will be type 510-A, 35 hp., 600 volt, the control will be single end K-35-HH, with a Westinghouse type 801-E line switch used in conjunction with pneumatic door engines and door-interlocking equipments.

Track and Roadway

Department of Street Railways, Detroit, Mich., will probably rebuild 12 to 15 miles of double track overhead this summer.

Public Service Railway, Newark, N.J., has removed the tracks from along the curb line and placed them in the center of the streets at Woodbury, N. J.

Gary (Ind.) Street Railway will use Dayton resilient ties in the reconstruction work on Broadway from the Wabash Railroad to the north terminus at the steel mill gates. This improvement was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 20.

Petaluma & Santa Rosa Railroad, Petaluma, Cal., has been granted permission by the State Railroad Commission to construct eleven grade crossings for a spur track across Washington, Water, and First Streets and B, C, D, E, F, G and H Streets and Second Street in the City of Petaluma.

Pacific Northwest Traction Company, Everett, Wash., H. B. Sewall, manager, announces that an expenditure of $250,000 will be made on the interurban line running between Bellingham and towns in Skagit County. The work proposed will include the replacing of several bridges, and four and one-half miles of trestle decking.

Shops and Buildings

Georgia Railway & Power Company, Atlanta, Ga., expects to build one new carhouse.

Department of Street Railways, Detroit, Mich., will build a new shop building 275 x 237 ft. in the immediate future for use as a paint shop and shop office and stores building.

Hagerstown & Frederick Railway, Hagerstown, Md., has broken ground at the carhouse on Summit Avenue for a storage building 33 ft. x 63 ft. It will be one story and constructed of brick and tile, with concrete floor. It will be used by the company for storage of material for general repairs, such as wire, etc.

Boston (Mass.) Elevated Railway expects to be in the new inspection and repair shops being erected at Forest Hills on scheduled time. The building is two stories high, 65 x 450-ft. of brick and steel and will cost about $250,000. When the structure is complete the company will have a modern repair shop.

New York, N. Y.—The Transit Commission has ordered that bids be received on June 2 for the construction of a temporary car shed at the Lenox Avenue shops of the Interborough Rapid Transit Company on 147th Street and for storage tracks in the 180th Street yard. These sheds are to house 350 new subway cars, 100 of which are to be ordered immediately.

Trade Notes

Galena-Signal Oil Company, Detroit, Mich., announces the removal of its Detroit office from Room 2203 Dime Bank Building to Room 2214.

Fiber Conduit Company, Orangeburg, N. Y., has acquired the plant of the American Fiber Conduit Corporation at Fulton, N. Y., and the conduit manufacturing business of the Johns-Manville Company at Lockport, N. Y., and has appointed Johns-Manville Inc., as sales agent for its products, effective as of May 15, 1922.

Johns-Manville, Inc.-The Johns-Pratt Company have mutually decided to manufacture and market their respective products separately. For many years Johns-Manville, Inc., has acted as exclusive selling agents for the various products manufactured by the Johns-Pratt Company, of Hartford, Conn. Both parties feel that now they can serve the trade more effectively and economically by concentrating on their own lines. The change will become effective on June 15.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received from the Municipal Railways of San Francisco an order for twenty double equipments of 532-A motors and double-end K-36 JR control. Each equipment will also include an 806-D line switch. This order represents the first application of 532-A motors to Brill Radiax trucks. Helical gears are to be furnished on the motors. The municipal lines of San Francisco have had in service for approximately one year one trial equipment similar to those recently ordered.

New Advertising Literature

English Electric Company, Ltd., London, England, has just issued new publications Nos. 330, 331, 332, and 336. These give information regarding cylindrical balanced valves, electric relief valves, electric bucket attachment for impulse wheels, and the Fullagar oil engine.

Miller Trolley Shoe Company, Boston, Mass., has just issued a twenty-two-page catalog descriptive of its trolley shoes. Illustrations of cars and trains for many of the electric railways using this equipment are given, together with information on the operation of the shoe as a current-collecting device.

Canadian Car & Foundry Company, Ltd., and its subsidiary, the Canadian Steel Foundries, Ltd., of Montreal, have issued bulletins Nos. 42 and 43 giving description of cars built for the Toronto Transportation Commission. This company built the 140 steel frame motor cars and sixty steel frame trailers recently put in service by the Toronto Transportation Commission. A large amount of manganese special trackwork used in the rehabilitation of the Toronto system was also supplied by this company.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Philadelphia Must Have a New Deal

PHILADELPHIA appears to have reached the end of its traction rope. President Mitten frankly says so, and expert Feustel for the city virtually admits as much. Mr. Mitten's plea is for the entrance of the city as a real partner of the company in planning for the future. Mr. Feustel sees an arrangement of this kind as the only way out if transit facilities are to be increased in keeping with the growth of the city.

On the whole the conditions of the proposal made by Mr. Mitten are not unlike, in their object, the end which the New York Transit Commission is seeking to reach. The need is imperative in both cities for planning for the future. In Philadelphia, however, the way would seem to be easier to accomplish the desired end, for in that city there are not the besetting political complications which exist in New York in the shape of a hostile city administration whose policy is one of obstruction with respect to the building of new lines, although much progress has been made in New York recently between the companies and the state-created commission toward a basis of understanding so far as the existing systems are concerned. One thing Mr. Mitten has done in his statement that should redound to the benefit of the entire industry—he has helped to drive home the lesson of the extent to which the real estate owners and speculators have profited through rapid transit expansion. The land values thus created have enriched the real estate dealers and owners, but made the railways poor indeed.

There Is Still Time in Louisville

HOPE seems to have gone a-glimmering for the orderly settlement out of court of the question of the fare to be charged by the Louisville Railway. At least the filing of a petition with the court on the part of the city in the case recently decided against it in the controversy with the company would indicate this to be the fact, although President Barnes is doing everything in his power to bring about a settlement without further litigation. It is not a case of peace at any price with the company. As a matter of fact, as things now stand the Louisville Railway would appear in the long run to have most to gain by insisting upon its legal rights.

The proposal from Mr. Barnes is for a sliding scale of fare. The tendency with the representatives of the city as with many others is to picture such a proposal from only one angle, the angle of the fare sliding up. Louisville people should stop to consider that even without any such settlement arrangement as is now being suggested the fare did slide up to 7 cents. The fact is that Mr. Barnes has the future of the city as firmly in mind in his proposal as he has that of his own company. Like many other managers, he has learned that there is little magic in the so-called unalterable fare whether it be 5 cents, 6 cents or 7 cents. There can be only one criterion as regards fares. It is that the rate shall be such as to insure economical and efficient service, afford the employees fair wages and working conditions and protect the rights of the investors. A fixed rate is incompatible with any such ideals as these.

The litigation so far carried on in Louisville has been costly. It is being reflected in the increased fare which residents of that city are now paying. The sensible thing for the city of Louisville to do would be to forget litigation and get together with the railway on the basis of some such settlement as President Barnes has suggested—a settlement that will restore the credit of the company and make possible the raising of $1,000,000 or more for the purpose of extending and improving the existing lines.

Solving the Problem of Interurban Bus Competition

O. HENRY had a character, one Jeff Peters, who had to be reminded. Whenever he was called upon, pointedly, for a story, he would maintain that his life had been as devoid of incident as the longest of Trollope's novels. When lured, however, he would grow garrulous. It sometimes seems that electric railway managers are less responsive in having their latent abilities awakened than was Jeff in reacting to stimulating suggestion. But when aroused these railway men can accomplish wonders.

Recently in Lexington, Ky., cerebral activity was quickened by the keenly felt competition of the bus. What did a little inquisitive probing show? It revealed that the replacement of 76,000-lb. two-man interurbans with one-man cars one-third as heavy would net operating economies sufficient to pay a substantial return on the increased investment. With such a financial assurance, ten 25,000-lb. cars were ordered, in the design and equipment of which no feature or appliance was overlooked that would make people prefer them to the buses. Seats were made wide and comfortable. The interior of the car was made to appear roomy and attractive by the absence of all unsightly devices. The fare collection method and the step and platform design are such as to inconvenience the passenger the least possible. The advent of these cars was accompanied by a 50 per cent increase in service and a decrease in the fare.

Two months later. Buses gone. Increased traffic and cars popular. Power demand of combined city and interurban load has fallen off 15 per cent. Peak of interurban load alone is 50 per cent lower. Power house capacity released by leveling of load curve has a value equal to 80 per cent of the investment in the new cars. Moreover, it was possible to resell the re-

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leased power capacity to meet an increased lighting load. Energy consumption on a car-mile basis is now one-half its former value. Provided the remaining 20 per cent of the car cost is met by the salvage value of some of the old equipment, the new capital required is zero dollars. When further economies of labor, track and car maintenance, power, etc., are now mentioned they connote profit.

In producing a unit to comply with the specifications laid down by the railway, the car manufacturer was not without his problems. To meet the conditions, a type of construction new to car design was applied. The use of a curved side with a reverse bend so that the sheet steel side acts as a girder is distinctly a development in the art. Although the frame design is the largest factor in reducing the car weight, aluminum was used to advantage in several places. Careful design also helped eliminate excess metal from the low-floor trucks of the arch-bar type. All in all, the fabrication of an interurban car weighing but 555 lb. per seat is indeed an accomplishment of considerable moment to the industry. It shows what the railway manager will ask for and what the car builder can produce when the exigency arises.

The car design, however, is but one phase of the general plan of applying merchandising principles to the complete revamping of the interurban service. Every consideration which would save time and trouble and make the service a pleasure as well as a necessity received the study which it deserved. Undoubtedly the riders, if asked why they prefer the present transportation facilities to any other, would answer speed, comfort, cheapness and frequency of service. Ask the manager for his explanation and he will go much deeper into the underlying reasons, the paramount of which, one discovers, is pleasing the public.

Success in Detroit Would Not Establish Success of M. O. Generally

COMPLETE municipalization of the street car service in Detroit, long expected, is now a fact. The methods and policies that have given a measure of respect for the accomplishments of the Department of Street Railways, as applied to the small system constructed by the city, are now extended to the entire local transportation facilities. To those who are confidently expecting this situation again to demonstrate the inherent fallacy of municipal ownership and operation, it should be said that their hopes are likely to be fruitless, for the true outlook is that there is more prospect of success than failure in Detroit.

The reasons for this go back to fundamentals. It should be recalled that a new city charter became effective in Detroit June 27, 1918. This put a completely new aspect on the conduct of the city's business and paved the way for a strictly businesslike handling of the street railway service, provision for which was incorporated in the new charter. By the new form of government forty-two Councilmen elected by wards on partisan tickets were replaced by nine Councilmen all elected at large on non-partisan tickets. On the former basis, the Council met once a week, affairs were carried on through twenty-six committees, each having a membership of seven, and Councilmen were paid a part time salary of $1,200. Under the new charter the Council convenes daily, except Saturdays and holiday; the city's affairs are conducted by the entire Council meeting in committee of the whole and the Councilmen devote full time to city matters, with salaries of $5,000.

These few points will serve to show that the background for the municipal operation of the street railways is a business administration of the city. It is said that probably no other large city in the country is as free from political or other corruption as is Detroit today, though it was one of the worst formerly. No small part of this is due to Mayor Couzens, a business man of independent means and with a high ambition to make the most of his city.

From the section of the charter dealing specifically with the street railway commission are found these additional reasons for the prospect of a successful municipal railway undertaking in Detroit. The commission consists of three members who serve without pay. For purposes of acquiring a railway property by purchase or construction, the City Council is authorized to issue bonds in such amount as will not exceed the legal bonding limit of the city and up to the amount of 2 per cent of the assessed value of the real and personal property of the city. Further bonds may be issued regardless of the city's bonding limit, but which shall impose no liability on the city and shall be secured only by the property and revenues of the street railway by them. The rate of fare must be sufficient to pay "(a) operating and maintenance expenses, including paving and watering between tracks; (b) taxes on the physical property of the entire street car system, the same as though privately owned; (c) fixed charges; (d) a sufficient per cent per annum to provide a sinking fund to pay the principal of the mortgage bonds issued at their maturity and such other additional per cent per annum to provide . . . a sinking fund to pay the principal of the general bonds issued as soon as practicable, to the end that the entire cost of said street railway system shall be paid eventually out of the earnings thereof." The railway department must also be operated on an annual budget basis.

Couple these provisions with the fact that the railway organization is altogether a thoroughly experienced one in private operation and is given an unusual degree of freedom in the exercise of railway judgment and it becomes apparent that the Detroit project taken as a whole gives sound reason to expect a good showing. Furthermore, under the provisions cited and with the knowledge that it is the desire and aim of the commission and management to have the department carry all charges that are met with under private operation, it is seen that the results will probably be as nearly comparable with private operation as will ever be obtained. There is left, in a major way, only the advantages and disadvantages inherent to public ownership.

Granting the above, would success in Detroit establish the success of municipal ownership as a principle? No. Unfortunately, if success does attend the undertaking, Detroit will be held up as the great proof. But it proves the principle only if the same fundamental background for municipal ownership can be set up in another city that has been in Detroit, a thing which is exceedingly doubtful, particularly for the larger cities. On the other hand, while for this reason success in Detroit cannot be taken as the general demonstration of the principle, failure in Detroit under all these favoring circumstances would deal a crushing blow to the theory of municipalization.

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Calumet Station Adds 180,000 Kw. to Generating Capacity of Chicago Company

New Station of Commonwealth Edison Company Is Located in Great Industrial Section to the South of Chicago—Features Comprise Separation of Phases with Elimination of Short Circuit Possibility, Large Capacity Chain Grate Stokers, High Steam Pressure and Superheat and Integral Steel Economizers

CALUMET STATION, the fourth generating plant of the Commonwealth Edison Company, Chicago, with an initial installation of 60,000 kw., brings the total present capacity of the company up to 539,000 kw. Calumet is laid out for an ultimate capacity of 180,000 kw. and is located in the great industrial center just to the southeast of Chicago at 100th Street and the Calumet River. Here it will be in a strategic position to serve economically not only the tremendous growth of industrial activity in this great area to the south, but also to supply power for the terminal electrification of the steam railways. In the immediate district served by this plant there is probably the greatest network of railways that exists in any equal area in the world. The Illinois Central Railroad, having various lines through this territory, has already started its preliminary work, leading up to electrification within five years, and the next ten years will undoubtedly witness a great development along this line around Chicago. At present the Commonwealth Edison Company supplies all of the energy used by both the Chicago Elevated Railways and the Chicago Surface Lines with their 1,233 miles of track, and part of the power required by several other smaller electric railway properties extending out of Chicago. Whether this extensive service of power will be extended to include the steam railroads as they electrify is a problem of the future, but Calumet Station is there in readiness, if indeed the industrial load does not grow to exceed the ultimate capacity of the plant before the railroad load comes on.

Calumet Station has been planned to contain ultimately six 30,000-kw., 12,000-volt, three-phase, 60-cycle units, of which two have been installed. One of these was supplied by the Westinghouse Electric & Manufacturing Company and the other by the General Electric Company. This first section of the plant has been in operation for a few months and the work of extending the building for the next two units is already under way. The station is tied in with the Fisk Street station by means of two 33,000-volt, 350,000-circ.mil, lead-covered underground cables, each having a capacity of 15,000 kva. Up to date this is the highest voltage that has been used for transmission in a three-phase cable. The lines are sent through two 15,000-kva., 12,000 to 33,000-volt transformers connected to the station bus through 800-amp. reactors. At the Fisk Street end the voltage is stepped down by a similar installation of transformers.

One of the most interesting departures from former practices in generating station design is the wide separation of phases in the bus arrangement, a feature designed by B. G. Jamieson, engineer of inside plant for the company. Because of the enormous concentration of power on the bus system of the switch house, a design that would embody an unusually high factor of safety against a bus short circuit was developed. The buses are carried on three longitudinal walls placed 16 ft. apart, with one phase only on each wall. Like phases of the two main buses are installed, one on either side of each of these walls just below the ceiling of the first floor. The line buses are similarly arranged at the ceiling of the second floor on either side of similarly located bus walls. With this arrangement of buses, a special design of oil switch mechanism was required. The oil pots of the circuit breakers are installed on the second floor and the operating mechanism on the third floor. The arrangement necessitated a switch mechanism which would simultaneously operate the contacts in the three oil pots of a switch spaced 16 ft. apart.

Some of the Important Mechanical Features

In the mechanical design of the station a number of features have been incorporated which place it a step in advance of the older stations of the company. The boilers are slightly larger and are designed for an operating pressure of 350 lb. gage, as it is desired to furnish steam at the turbine throttle at a pressure of 300 lb. superheated 200 deg.; or to a final steam temperature of 622 deg. At the boiler the steam temperature will approximate 630 deg. F., as the safety valves are set to blow at 330 lb. Forced-draft chain grates are installed to burn Illinois coal. With one exception two stokers per boiler have been provided, and the one exception is a forced-draft chain grate of mammoth proportions. It measures 24 ft. wide and 18 ft. 6 in. long from inside the grate to the rear center. An individual steel economizer is placed directly above each boiler.

The heat balance of the station is maintained by bleeding steam at approximately atmospheric pressure from the main turbines through closed heaters which in conjunction with the open heaters raise the temperature of the feed water to 170 deg. F. The heat from the gland water and in all clean drips is conserved, and other economies are effected, which in the aggregate indicate the possibility of generating a kilowatt-hour at the switchboard on 18,000 to 19,000 B.t.u. The latter figure already has been obtained, and when all covering is on and the plant has settled into routine operation, the lower figure indicates the economy anticipated.

As may be seen from the sectional elevation of the plant the boilers are set on the second floor. Below the central firing aisle are the train shed for unloading coal and a storage pit having a capacity of 350 tons per boiler. On either side are the stoker ash hoppers, from which the ashes are dumped directly into railway cars without any intermediate handling. The forced-draft fans are on the boiler-room floor back of their respective boilers and the induced-draft fans are at either side of the boiler house on a level with the economizers above the boilers. They discharge into a smoke flue on the roof.

Four boilers per unit was the original plan, but the

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seven boilers now installed have given such excellent results, operating up to 300 per cent of nominal rating without the least difficulty and delivering 150,000 lb. of steam per hour, that three boilers per generating unit of 30,000 kw. is now considered ample. With a steam rate approximately 10 lb. per kilowatt-hour, it is evident that two of the larger boilers could meet the unit steam requirement. As each boiler contains 15,089 sq.ft. of steam-making surface, the allotment of three boilers per unit provides 45,267 sq.ft. of heating surface to supply steam to a 30,000-kw. generating unit. This is a provision of 1.5 sq.ft. per kilowatt of generator rating. In each boiler there are 4,052 sq.ft. of superheating surface and 9,669 sq.ft. of economizer.

Six of the boilers are served by forced-draft chain-grate stokers, two per boiler, set under the low end. Each stoker has an effective area of 182 sq.ft., giving 364 sq.ft. per boiler. To give a wide range of speed the stokers are driven by direct-current motors. Air is supplied by induction-motor-driven multivane fans mounted on the boiler-room floor, and controlled by push buttons on panels at the boiler fronts. The same type of control from the same location is applied to the induced-draft fans. Here also are the instruments in full view of the firemen while making the necessary adjustments of draft pressures and stoker speeds.

A feature of the furnace is the elimination of the bridge wall. Water-backs connected into the boiler circulation protect the rear wall, and ventilated tile at the clinker line afford protection to the side and center walls. Flat suspended arches of the new radial-end type are installed.

With the bottom of the front tube header 15 ft. 4 in. above the floor and the boiler tubes at the entrance to the first pass approximately 20 ft. above the grates, a furnace volume of 6,700 cu.ft. is secured. This is a provision of 18.4 cu.ft. of furnace volume per square foot of grate area, or roughly 0.3 cu.ft. per pound of coal burned at a combustion rate of 60 lb. of coal per hour per square foot of grate surface.

Under the seventh boiler the installation of the larger stoker is under way. As previously stated it is 24 ft. wide and 18 ft. 6 in. long with an effective area of 444 sq.ft., as compared to 364 sq.ft., the aggregate area of the two stokers serving each of the other boilers. Although the grate surface is continuous, the stoker is made up of two separate chains, with the driving shafts coupled at the center and a driving motor at either side, the two being under common control.

How Ashes and Coal Are Handled

Ashes are discharged from the rear end of the stokers into 50-ton hoppers placed directly underneath. These hoppers are protected against the action of the hot ashes and are provided with a sprinkler system for wetting down before they are discharged through pneumatically operated gates into railway cars.

Coal is unloaded immediately under the central firing aisle of the boiler room by means of a traveling crane which discharges either into a large storage pit or to a traveling hopper.

From the hopper the coal is fed onto a belt conveyor having an ultimate capacity of 400 tons per hour. The delivery is through a Bradford breaker serving the present installation. With the next addition to the plant another breaker will be installed and the belt will then deliver to each unit at the rate of 200 tons an hour. Although this type of breaker is used extensively in the byproducts coke industry, this is the first installation of the kind for a central station. Tramp iron, sulphur balls, mine props and any other refuse that may be in the coal are held back and passed out at the end of the breaker onto a belt conveyor. Here the refuse material is picked off and any good coal that may have been carried out of the breaker with it is allowed to pass on to another conveyor delivering into a small two-roll crusher which discharges into the pivoted bucket conveyor carrying the coal to the top of the boiler house.

Coal from the breaker passes into collecting hoppers and is fed onto a short belt conveyor which is reversible and may feed either one of two pivoted bucket conveyors elevating the coal to the overhead bunker level.

From the pivoted bucket conveyor the coal is passed into either one of two receiving hoppers which discharge directly onto belt conveyors running longitudinally above the coal bunkers. One set of reinforced-concrete bunkers, with individual capacities of 250 tons, serves each row of boilers.

Maintaining the Heat Balance

One of the features of the station is the arrangement of the feed-water system and the method of maintaining the heat balance. Temperature of the feed water will be maintained about 175 deg. F. to prevent condensation of the sulphurous acid in the flue gases and thus eliminate to a great extent the external corrosion that would otherwise take place in the steel economizers. Essentially, this is accomplished by introducing a closed heater between the condenser hotwell and the usual open feed-water heater. From the main turbines at about atmospheric pressure sufficient steam is bled through the closed heater to maintain the water in the open heater at the temperature previously given. A recording thermometer in the boiler room shows the temperature of the water in the open heater at all times and guides the operator in varying the amount of steam bled from the turbines by adjusting a hand-operated valve in the bleeder line.

To heat the condensate, a certain amount of exhaust steam from auxiliaries as well as the discharge from steam traps is available. Three of the four boiler-feed pumps are turbine-driven. There is also a 50-hp. turbine-driven service pump, and with the exception of the circulating pumps the condenser auxiliaries are in duplicate, one set being driven by turbines and the other by motors. As many of the auxiliaries as the heat balance will permit will be electrically operated.

An open heater rated to heat 400,000 lb. of water per hour from 85 to 175 deg. F. is provided for each unit, the two being connected in parallel. The closed heaters are practically of the same capacity. The arrangement of the piping and auxiliaries for both units are practically identical with the exception of the gland heated and the hydraulic air pumps. The use of steam seals in turbine No. 1 made it desirable to recover the heat in this steam by passing it through an additional closed heater. The condensation from both of these closed heaters is returned to the hotwell of the condenser. The condensate pump draws from the hotwell of the condenser and forces the feed water through the closed heaters to the open feed-water heater. It then passes down to the feed pumps, which are cross-connected on the discharge side to give flexibility, and is forced up through the economizers to the boilers

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Cross-section of

Calumet Station, Commonwealth Edison Company

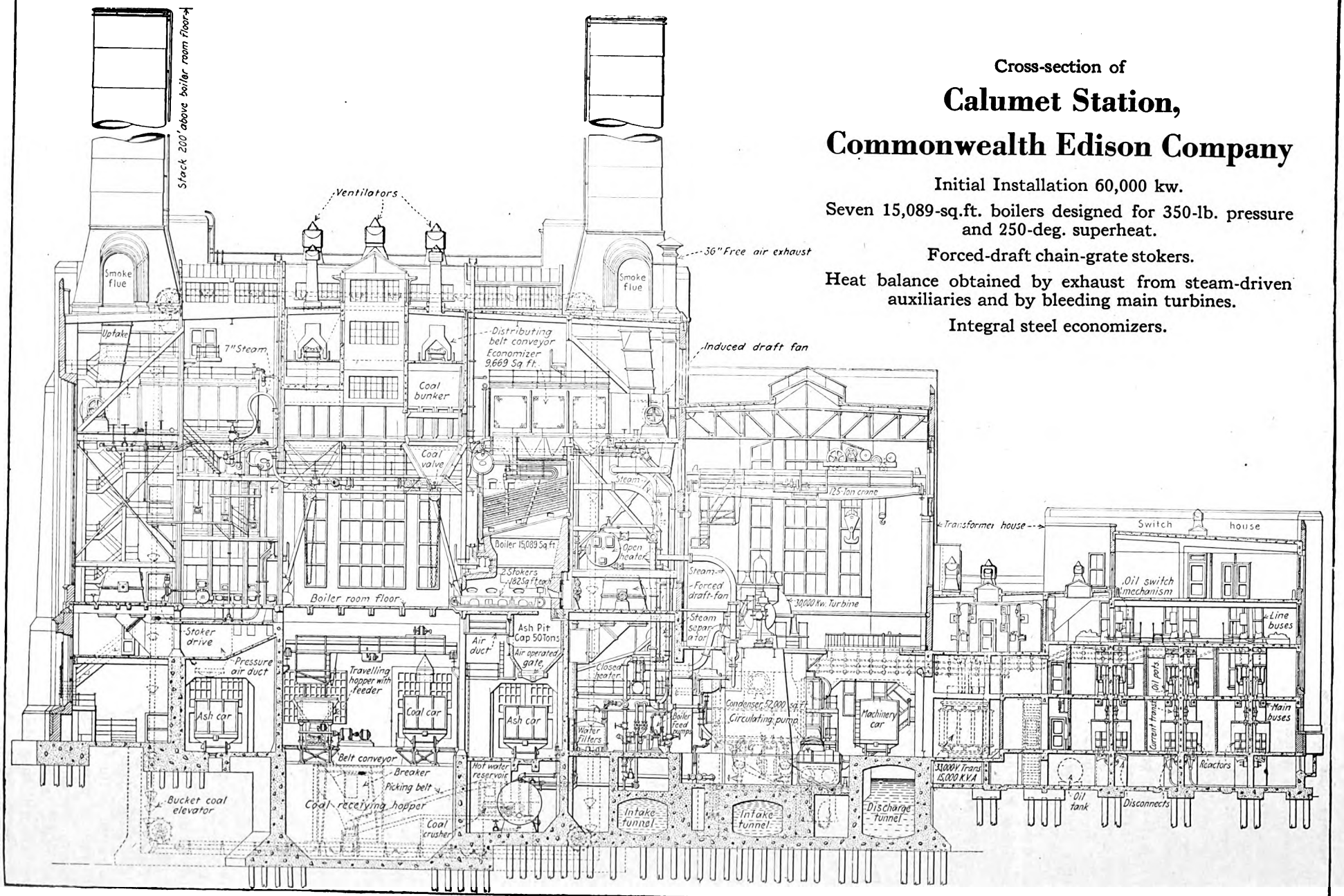
Initial Installation 60,000 kw.

Seven 15,089-sq.ft. boilers designed for 350-lb. pressure and 250-deg. superheat.

Forced-draft chain-grate stokers.

Heat balance obtained by exhaust from steam-driven auxiliaries and by bleeding main turbines.

Integral steel economizers.



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against a head ranging from 380 to 400 lb. gage. Another path is through the auxiliary feed or wash line which bypasses the economizers and leads directly to the boilers. Feed-water regulators control the supply entering each boiler.

As previously stated, two generating units have been installed, each having a capacity of 30,000 kw. at 85 per cent power factor. The Westinghouse unit is a tandem compound machine having a speed of 1,200 r.p.m., and the General Electric unit develops the entire capacity in a single casing, the speed being 1,800 r.p.m. The condensers are of the surface type with 52,000 sq.ft. of surface, which reduces to 1.73 sq.ft. per kilowatt of generator rating. For each unit one circulating pump of the slow-speed type is installed. The other condenser auxiliaries are installed in duplicate, one unit of the pair being turbine-driven and the other motor-driven.

The Westinghouse unit has two condensate pumps each rated at 1,000 gal. per minute, with 100-hp. 2,300-volt induction-motor drive in one case and a 60-hp. turbine in the other. The air pumps are of the Leblanc type. For the General Electric unit hydraulic air pumps are employed. Four units are installed, although normally two will take care of the requirements. The installation includes hurling-water pumps and a tank to store the water circulated through the air nozzles.

Power Supply and Control of Auxiliaries

As much of the auxiliary apparatus in the station is motor-driven, elaborate provision has been made to insure the continuity of the electric supply. All auxiliary motors larger than 100 hp. are on 2,300-volt service and those below 100 hp. are designed for 440 volts, with the exception of the stoker motors, which are 220-volt direct-current machines. To supply these services stepdown transformers are connected to a special 12,000-volt bus placed in the transformer house.

For the 2,300-volt auxiliary service three buses have been provided—a 1,200-volt starting bus, a 2,300-volt running bus and a transfer bus, the last being an alternate to the running bus and supplied by an emergency transformer from the opposing section of the main auxiliary bus. The 2,300-volt auxiliary power center is located in the transformer house at the turbine-room floor level. All service switches for the large motors are installed in this location and arranged for remote control from the motors. Compensating starters are employed only on the 440-volt motors.

Throughout the station 220-volt direct-current control is employed. The operating bus is supplied by either one of two 200-kw. motor-generator sets, with a 120-cell, 1,500-ampere-hour storage battery floating on the line. From this same bus the stoker motors are driven and it is also an emergency source for excitation of the main generating units.

Safety Campaign of Steam Railroads

A FOUR months safety campaign of the steam railroads, designed especially to eliminate accidents at grade crossings, will begin on all the roads in the United States and Canada on June 1. It is under the direction of the American Railway Association and has been indorsed by President Harding. A poster has been prepared by the steam railroads for use in passenger stations and elsewhere, representing an automobile attempting to cross the tracks in front of an approaching locomotive.

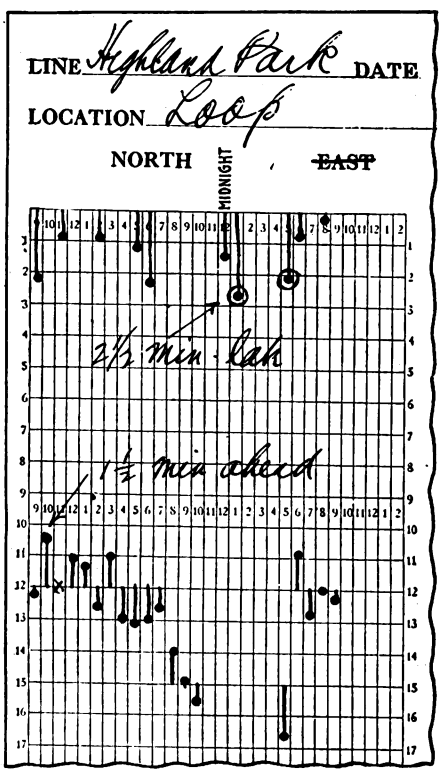
Letters to the Editors

Checking Schedules in Baltimore and Elsewhere

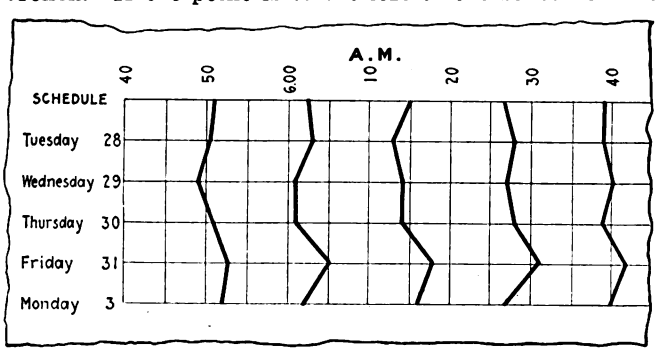
LOUISVILLE, KY., May 9, 1922.

To the Editors:

I note the reference on page 744 of your issue of May 6 to a method employed in Atlanta for plotting actual time. It may not be generally known that there is a commercial device for recording actual time of cars at a time point and operated automatically by the cars themselves. The record is revolved on a cylinder and is printed through typewriter ribbon in the form of dots along a spiral line, which, when unrolled, is in the form of oblique parallel lines on a sheet of paper. It is easy to draw lines from the points made by the car to the points indicating the schedule time. The length of these lines then shows how much the car has departed from schedule, and the direction of them, whether ahead or late. A part of such a sheet is shown herewith. From several of these records, taken on successive days, a comparison of performance may be graphically shown as in the second illustration. In this chart the vertical line to the left gives the correct schedule, while the curve shows the actual arrival time on successive days. The points for each run number are then connected together. If the cars conform to schedule, each run number will produce a straight vertical line, but as they depart from schedule this line will be more broken. If the point is to the left of the schedule time



PORTION OF RECORD FROM HEADWAY RECORDER (LENGTH OF LINE SHOWS DEPARTURE FROM SCHEDULE)



PORTION OF SHEET USED IN BALTIMORE FOR COMPARING ACCURACY WITH WHICH CARS KEEP TO SCHEDULES ON SUCCESSIVE DAYS

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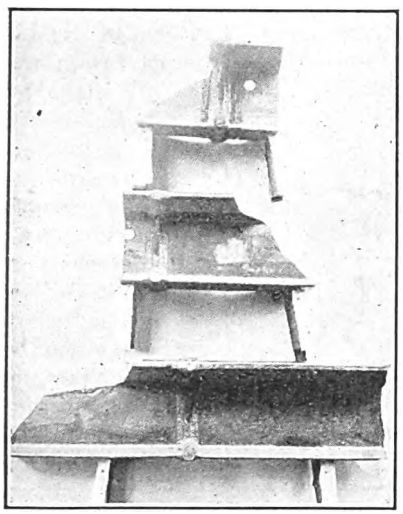
it shows that the car was ahead of time, but if to the right the car was late. Each motorman can therefore see his records on successive days in an instant.

This method of plotting the results from the Automatic Headway Recorder is to be credited to J. A. Stoll, superintendent of traffic United Railways & Electric Company, Baltimore, Md. CARL P. NAGHOD.

Thermit Weld Cost Reduced

SAVINGS varying from $2 to $3 per joint have been made possible by the recent development by the Metal & Thermit Corporation, New York, of a modified Thermit insert rail weld, wherein the usual reinforcing collar is so proportioned as to give a perfect weld with considerably less Thermit than was formerly believed necessary.

The modified weld, known as the "center pour weld," involves no fundamental changes from the type of Thermit insert weld which has been used extensively for ten years by street railways throughout the United States. By making a great many welds and then breaking them, it was found possible gradually to change the design of the pattern so as to utilize the Thermit steel collar in the most scientific manner and to best advantage. A slight rearrangement has also been made in the proportions and locations of the pouring gate, heating gate and riser. A narrower gap is also used between rail ends. It has been found that an average of ½ in. gap will give the best results. The saving in using the new weld consists not only in a saving of the Thermit welding portions, but also in the crucibles, as a much smaller crucible can be used, which in turn gives several more reactions per crucible lining. An average of twenty-five or more reactions per crucible lining can be obtained.



RESULTS OF DROP TESTS ON WELDED JOINTS

When used in conjunction with new style self-luting mold boxes, which require no hand luting whatsoever, the operations merely require clamping the molds to the rails, preheating and pouring. The preheating takes from twenty minutes to a half hour per joint and the number of joints which can be welded in a day is only limited to the number that can be preheated. When two joints are preheated at a time, there should be no trouble in making thirty-five to forty joints per day with a comparatively small gang.

Thermit insert rail welding operations have also been simplified by the perfection of a new Thermit mixture which develops such heat that the additions can be mixed cold in it instead of being put in a can and preheated.

Under recent repeated drop tests, sections of rail welded by this method broke entirely outside of the weld in every instance, thus demonstrating conclusively that the weld was absolutely as strong as the rail. The detailed results of the drop tests are shown by the following data and in the accompanying illustrations:

Test No. 1:

Rail section welded—L. S. Co. 134-506.

Nature of test—Foundation and support of rail tested, the rail supported on semi-elastic foundation, *i.e.*, steel plates were laid on the dirt floor of the welding shop, on the top of which were placed 6-in. tee rail, and the rail to be tested in turn placed upon this tee rail on 3-in. centers.

Weight used: 2,500 lb. Heights of drops: 20 in., 30 in., 48 in., 79 in.

Result: The last drop was as high as could be given and no deflection or breakage occurred.

Test No. 2:

Rail section welded—Same as in Test No. 1.

Nature of test—Foundation and support of rail tested—foundation consisted of two 10-ft. square steel billets each 3 ft. 8 in. long imbedded horizontally in the dirt floor of the welding shop. On these billets were placed 6-in. tee rail on 3-ft. center.

Weight used: 2,000 lb. Height of drop: One 9-ft. drop only.

Result: Rail tested broke entirely through the rail steel adjacent to the thermit collar.

Test No. 3:

Rail section welded and nature of test similar to test No. 2 except:

Height of drop: One 30-in. drop only.

Result: Rail broke through the base 3 in. from weld, proving conclusively a rail failure and not a weld failure.

Test No. 4:

Rail section welded and nature of test similar to Test No. 2 except:

Heights of drops: 12 in., 18 in., 24 in., 30 in., 40 in., 50 in., 72 in., 100 in.

Results: No deflection was noted until 40-in. drop was made. As nearly as can be measured, this deflection for the 3-ft. span was about .005 in. and the deflection after the 72-in. drop amounted to a total of .014 in. The rail broke at the 100-in. drop 14 in. from the weld at the base diagonally up through the rail to a point about 7 in. away from the weld on the head, which also proves a rail failure and not a weld failure.

Test No. 5:

Type of rail tested and nature of test similar to Test No. 2 except:

Heights of drops: 30 in., 48 in., 66 in.

Results: No deflection took place at the 30-in. drop. A deflection of .008 in. occurred at the 48-in. drop and the rail broke at the 66-in. drop. The fracture occurred 17 in. from the weld at the base and fractured diagonally up through the rail, emerging through the head 4½ in. from the weld, thus showing a rail and not a weld failure.

NOTE: In none of the tests Nos. 1-5, inclusive, did the total length of rail after welding exceed 4 ft.

Test No. 6:

Rail section welded: 9 in. L. S. Co. 134-470. This section and section L. S. Co. 134-506 (used in previous tests) are almost identical; the only difference being that the 506 section has a slightly curved contour on the running surface of the head, whereas the 470 section is flat.

Results: No deflection occurred at the 30 in. or 48 in. drop. A deflection of .005 in. occurred at the 66-in. drop and the rail broke at the 104-in. drop. The break occurred through the base 8 in. from the weld and ran diagonally upward toward the weld, breaking through the head alongside of the insert and 1¾ in. away from the weld through the lip. There was a bolt hole through the web of this rail about 2 in. away from the weld and the broken specimen shows a crack extending from this bolt hole toward and through the weld. It is possible that had this crack at the bolt hole been absent, the rail may have broken completely through the head away from the weld.

The modified insert weld was demonstrated on May 12 before the members of the committee on way matters of the American Electric Railway Association at the Jersey City plant of the Metal & Thermit Corporation. One man was able to make a mold, preheat and pour a weld in less than one hour's time. As nearly half of this was devoted to preheating alone it is evident that a welding gang of say five men can proceed at a much more rapid rate by dividing the work.

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Overhead and Car Current Collecting Devices*

Wear on Wheels and Trolley Wire Is Shown to Be Due to a Combination of the Qualities of Both, Together with Operating Conditions—Relative Merits on Wheel and Sliding Shoe Are Discussed

By Leslie E. Delf
Electrical Engineer Northern Texas Traction Company, Forth Worth, Tex.

THE collection of current for electric cars from an overhead wire involves three essential parts of equipment, namely, the trolley wire, the contact element, whether wheel, sliding shoe or bow slide, and the trolley base. Each plays an important part in the operation. On most railways the care of the trolley wire is in the hands of the electrical engineer or line foreman, while the master mechanic has supervision of the wheels and bases. This has sometimes led to each doing his best to keep his particular part of the equipment in good condition but failing to consider whether that condition is best for the other man's part of the equipment.

The fundamental requirements of the current collective device are: first, minimum wear on wire; second, minimum wear (and consequently minimum cost per 1,000 car-miles) on wheel or slide; and third, negligible power loss in collection operation. This last-named has a direct bearing on the other two and can, for all practical purposes, be included in them, for excessive power loss will produce heating and burning which will reduce life of both wire and wheel.

Hard-drawn copper has been the standard material for trolley wire for a number of years. For operation on this type of wire a wheel was developed having an analysis of approximately 91 per cent copper, 8 per cent tin, 1 per cent zinc, lead and impurities. This combination of wire and wheel gave excellent service until traffic condition became so severe, particularly in downtown districts, as to demand a wire having greater wearing qualities. This demand was met by the production of copper-alloy wires, the best-known and apparently most successful of which is phono-electric. War conditions brought about the use of some galvanized steel wire on certain properties. Recently a new copper-alloy, known as cadmium-copper-alloy, has been used in certain Canadian cities with considerable success.

The hardness of both the wire and the wheel has bearing upon the life of both. The harder the wheel the longer will be its life and consequently the shorter the life of the wire on which it runs. Hard-drawn copper wire with the present trolley wheels seems to be a happy combination in so far as with them the total wear is just about at a minimum. Both copper-alloy and steel wire are considerably harder than hard-drawn wire. Our experience indicates that they have two or three times the life of hard-drawn copper under the same conditions. However, our records show that during the few years that we have been increasing the use of such wire the average mileage of our trolley wheels has dropped steadily, year by year, from around 20,000 miles to 3,219 miles in 1921. Some other factors such as increase in schedule speed may have entered into this drop, but still other factors such as the reduced current consumption of the safety car should tend to offset them.

This reduced life of trolley wheels has not been due only to the abrasive wear caused by the wheel traveling over the harder wires. These wires present a smooth surface on the underrun due to the uniformity and slowness of their wear. This surface is so smooth that it often does not give sufficient friction between the wire and wheel to cause the latter to revolve. This action is very intermittent with the six-inch wheels running on one-inch pins that are used on this property and depends a great deal upon the condition of the wheel bearing and its lubrication. It has been most frequently noted when a car first starts up as at that time the inertia of the wheel is added to the static friction of the bearing and so gives the worst condition tending to cause the wheel to slide rather than roll. Once a flat spot is started on the throat of a wheel it is rapidly increased by the pounding it produces on the wire when the wheel is revolving at high speed. The harder the wire the faster the flat spot develops. On one line on which we have 3 miles of steel wire, wheels pound so badly after 900 miles operation that they have to be removed although the throat is far from worn out.

Last summer trolley breaks on our city lines started to increase at an alarming rate. All were in comparatively large sized wire and were located in the ears at that point about an inch from the end, where the wire commenced to be rigidly held by the ear. Each break showed evidence of crystallization or fatigue of the copper at that point and indicated that it had been in progress of fracture for some time. A study of conditions led us to the conclusion that the pounding of the wire by trolley wheels with flat spots in the throat had set up vibrations which traveled to the ear and were there damped out by the larger mass of the ear, the energy of these vibrations being expended at the point which subsequently developed the break. Relief was sought by equipping most of our regular cars with trolley shoes. As these fractures require considerable time to develop and consequently there were probably a number at various points on our lines that had not progressed to the point of failure, we cannot say positively that our assumptions were correct, but the pronounced reduction of breaks would indicate that they were not far from right.

The action described above is so much greater on wheels operating on steel wire than on those operating on copper-alloy wire that we shall discontinue the use of steel wire on lines on which wheels are used. It is necessary, however, to provide a wire harder and with a longer life than hard-drawn copper to meet heavy traffic conditions and so we cannot afford to go back to hard-drawn copper wire where these conditions obtain. This means that if we are to maintain our old standards of current collection costs some collection device must be developed which will eliminate the troubles experienced with the present trolley wheel when operated on copper-alloy wire.

This company conducted its first test of the sliding shoe collector by equipping two cars with Miller trolley shoes in March, 1921. The two shoes on one car were removed as worn out in February, 1922, operating 28,600 miles apiece. The other pair are still in use after covering 21,229 miles each. In September the trolley break situation mentioned above became so bad that we commenced equipping other cars with shoes until we now have seventy-four cars using them. These latter shoes have not shown the mileage that the four test shoes developed. Thirty-four shoes have worn out to date having operated an average of 8221.7 miles each. The wearing qualities of the individual shoe have varied greatly. On one car the shoe on one end outwore three shoes on the other end, both covering the same mileage on the same line.

The operation of the shoe on copper-alloy wire is excellent, both wire and shoe taking a high polish. This same polish develops on steel wire, but the wear on the shoe is excessive. Average life of shoes operating on a line with about 3 miles of steel wire is approximately 3,300 miles. The action of the shoe on hard-drawn copper wire has been extremely variable. Certain wire, chiefly that purchased prior to 1917, takes a high polish similar to the harder wire, but other wire, as a rule that put up more recently, shows signs of considerable scraping action from the shoes. Lack of statistical data on wire wear with wheels renders it impossible to compare the action of wheel and shoe under similar conditions, but an average of micrometer measurements on several representative lines outside the business district indicate a life of about five years for hard-drawn copper wire when used with the shoe.

The shoe rides the wire and special work better than the wheel. A considerably lower trolley tension is pos-

*Abstract of paper presented before the Street & Interurban Railway Section of the Southwestern Electrical & Gas Association, San Antonio, Tex., May 3-6, 1922.

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sible and there is less arcing and pounding at ears than with wheels. We have found, however, that when the shoe has been worn so that a groove is cut in its throat somewhat larger than the diameter of the trolley wire, the shoulders of this groove tend to cut out the sides of ears and sleeves and permit the wire to drop. We find that the shoe handles sleet on trolley wire a great deal better than do wheels. One objection to the shoe on the part of the trainmen is that it is not safe to back up a car equipped with shoes, but this disadvantage is offset in the minds of most of the men by the superior manner in which the shoe passes through special work and stays on the wire.

The tension used to keep the shoes or slides upon the wire determines in a large measure the life of the wire and collecting device. Excessive pressure causes undue wear on both wire and wheel or slide and increases wire breakage due to bending of wire at ears especially where the trolley wire is slack. On the other hand, too little tension will mean a large number of wild trolleys and consequent damage to span and trolley wire. It also will permit the wheel or slide to leave the wire when hitting ears and so produce arcing at the approach end of the ear and a pounding of the ear and wire when the wheel again seats itself against the wire. The result of this pounding is usually seen at the center of the ear. The proper tension to use on any given system will depend on the accuracy with which the trolley wire is aligned and special work is adjusted, maximum height of wire, weight of shoe or slide and the sensitiveness of the trolley base. Using a 6-in. wheel we have secured best results with about 30 lb. downward pull with trolley wheel 18 ft. above the rail. With a Miller shoe we get best results with about 22 lb.

Tests recently conducted in the Fort Worth shops on a number of different types of bases indicate that practically all bases have sufficient freedom of movement in the horizontal plane when in good condition. It was found, however, that the friction in the base, opposing movement in the vertical plane, varied over a wide range and was dependent upon the make, amount of wear and lubrication of the base.

With the light-weight base that is installed on all our safety cars we found that it required 35 lb., as measured by spring balance attached to the trolley rope, to produce a downward movement of the pole, but that the pole only pulled, say 11 lb., against the spring when it started its upward movement again. This means that the trolley wire must take a pressure of 35 lb. when the pole is moving downward when approaching the center of a span and when striking an ear but that there is only an effective pressure of 11 lb. available to keep the wheel on the wire through special work or where the tendency for the pole is to rise.

An average of tests on a number of this type bases showed that it took 24 lb. more to lower the pole than to raise it. These tests were made on cars that had been in operation for some time and some of the bases were considerably worn. The bearings involved in vertical movement were then lubricated with "3-in-1" oil and the friction was reduced by from 12 to 5 lb. Similar tests made on new heavy-type bases averaged 3.4 lb. difference between the up and downward pull on three makes of bases.

A net difference of 6 lb. should be considered a maximum allowable variation on a good base on account of friction. The manufacturers of the light-weight base have made changes that are intended to overcome the excessive friction of this base and results of tests on this base should be available soon.

Directors of Public Information Bureaus Meet

DURING the week of the N. E. L. A. convention there was also a meeting of the directors of the various state public utility information bureaus. These directors held two most interesting sessions during the week, interest in which is as much from the electric railway as from the electric lighting industry.

Animated and constructive discussion of the most successful ways and means of getting the utility story to the people marked the first meeting. J. B. Mullaney, director of the Illinois committee, acting as chairman, directed the discussion of the papers and every vital point was dwelt upon. Four papers were read and discussed during the afternoon.

Four salient points are to be remembered if a public utility information bureau is to be a success, H. M. Lytle, associate director of the Illinois committee, declared in his paper, "The Newspaper Relationship." These points are: (1) There must be constant thought and effort. (2) The so-called press-agent type of publicity man has proved to be a flash in the pan. (3) Information must be collected and collaborated from every branch of the industry, for at best the individual knows only his own department. (4) More progress in educating utility employees in their business has been made in the past three years than in all the previous years combined, but this in reality is only a step. It was pointed out that few utility companies have even as yet organized themselves in a publicity, advertising or public relations way. Many continue to buy expensive space in advertising columns and then fill it with badly written matter which creates no good impression except upon the man who wrote it. Definite technique is required to do this, and it takes a skilled workman to tell a story in an advertisement successfully.

Speakers' Bureau of Vital Importance

Operation of a speakers' bureau in connection with state committees on public utility information is so vital, said Benjamin E. Ling, director of the Ohio committee, in his paper, "Public Addresses as Good-Will Builders," that it is doubtful whether this great co-operative effort at gaining good will for the public utility can be successful without it. The messages about the public utility industry which these public speakers have been able to "put across" in Ohio have had most pleasing results, and he thought that these results can be duplicated in every other state.

Excellent results were pointed to as a result of personal letters from the bureau directors when editorials and articles appeared in the press which showed misinformation on the part of the editor. Copies of such letters—which naturally treat only of the general utility situation and not of any local problem—are sent to utility executives in the city where the newspaper is published, so that, if advisable, information as to the local aspects may be added to the general information.

In his paper, "Possibilities in Public Utility Conventions," Alfred Fischer, director of the Michigan committee, dwelt on the possibilities of making the utility convention a great public mass meeting. He pointed out the desirability of throwing open the doors of the convention to the public and particularly emphasized the value of making the power plant available for public inspection. Mr. Fischer brought out the fact that the most successful means of reaching the public has been to leave discussion of utility problems out of the picture until the agricultural, industrial and civic dependence of a community upon electric power has been explained. Then the relation of the utility development to the communities' growth will naturally follow and be understood by the public.

The enormous value of imbuing engineering students with proper ideas of utility problems was emphasized by Horace M. Davis of Lincoln, Neb., who cited several specific cases where direct benefit had resulted from holding state conventions at the state universities and colleges. Participation in the convention programs by the engineering faculty has been found to be highly advisable, as it brings out an unusually instructive interchange of viewpoints.

In discussing this phase of public utility information the good moral support of the manufacturers was commended, and it was held that the value of the publicity efforts made by these manufacturers in the past cannot be overestimated. It was pointed out, however, by Howard T. Sands of Boston that it is now the duty of the utilities themselves to bear all the expense of this publicity.

Nothing can be so important as education relative to the utility industry,

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for it is its cornerstone, declared E. E. Lincoln, head of the chair of public utilities of Harvard University, at the second meeting. In Harvard University this is considered one of the most important subjects. There is the most profound ignorance relative to all public utility affairs. There is nothing too elementary to explain. For thirty years men in the utility business have gone on assuming a situation—assuming that the public knew about their business—and the public has known nothing.

John C. Mellett, director of the Indiana Committee on Public Utility Information, told of the co-operative effort under way in that state with the public schools, particularly high schools and colleges. A series of pamphlets, duplicating those published by the Illinois committee, has been sent to those schools requesting such pamphlets. These requests are brought through letters sent to the school superintendents advising them of the committee's work in preparing such informative matter.

H. M. Lytle, for the Illinois committee, said that it first had dealt with 356 high schools, but that since then the list had been expanded to 887 high schools and thirty colleges and universities of the state.

Joseph B. Groce, director New England Bureau of Public Service Information, declared that there is a necessity for the closest co-operation between the various state committees and the national associations. He said the big work before the committee and the national associations is to sell to America the knowledge that the utility industry is second only to farming as the nation's greatest enterprise and that it is a great industry whose essential character is such that unless it progresses and prospers the nation cannot prosper.

Labert St. Clair, publicity manager of the American Electric Railway Association, and Charles W. Person, secretary advertising section, American Gas Association, who were present, volunteered the closest co-operation with the state committees. Mr. St. Clair said that the state committees were close to the ground and could localize publicity and educational effort in a way that would get actual results which such effort directed from a centralized source could not hope to accomplish.

H. T. Sands, chairman public relations committee, N. E. L. A., said that the work of the committees must be carried out on state lines, that there must not be too much organization between the various state committees, and that they must continue their policy of hammering home the truths relative to the industry and staying out of controversies.

To work out a clear-cut program of co-operation between the state committees and the national associations, it was resolved to appoint a committee from the state directors to meet with the secretaries of the three national associations.

Some Post-War Problems of the Utilities*

Need of Legislation to Give Utility Securities a Wider Market—Advantages of Customer Ownership—Trend in Legislation and Regulation

BY CARL D. JACKSON
President National Association of Railway and Utilities Commissioners

ABNORMAL war conditions directly affecting public utility service and finance served to bring home clearly to the country fundamental economic laws. The public came more clearly to understand the importance of all kinds of public utility service in respect to every phase of daily life and recognized that adequate service could be obtained only through fair treatment of investors' capital dedicated to public use.

The war period also served to emphasize the short-sighted financial policy of many utility corporations and the necessity for broader and more farseeing and elastic policies in this respect if the utilities are to meet the full measure of public obligation on their part. Difficult as was the situation for many utilities during the war period, it is plain that post-war conditions have brought in their wake problems that must be met wisely if future progress is not to be seriously retarded. A greatly increasing demand for utility service is an outstanding characteristic of our economic development.

The capital requirements of which I shall shortly speak, which must be met if we are to reap the economic benefits in sight, are not only very great in amount, but the supply of capital is more or less controlled and curtailed by certain governmental policies calculated to affect very adversely not only the utility industry but all productive industry in the country. I refer, of course, to the tremendous flood of tax-exempt securities already issued and being issued in increased magnitude.

The present federal tax laws must necessarily handicap the securing of capital upon the most reasonable rates of interest, but the issuance of tax-exempt securities has deprived every industry, including the public utility industry, of a very important source of capital, and such capital as is now thus secured from the individual investor is generally secured on onerous terms.

The unquestioned desirability of a large volume of public utility securities for permanent investment is generally recognized. Such investments in the utility field, however, have not in many states received the full legal recognition to which they are entitled because of the highly important public function they are performing and the solid nature of the security offered. The system of regulation now in force in most states entitles the utility industry to the same recognition accorded the older branch of utility represented by steam roads.

There are thirty-one states in which there appears to be an entire absence of statutory authorization to savings banks for investment in gas, electric, telephone or electric railway securities, and two others in which authorization is lacking except for electric railways. The history of public utility securities entitles them to confidence. Practically all such issues are supervised by state agencies of reponsible authority. The utilities are essential to every-day modern life. The welfare and progress of the country depend upon their encouragement and development. Archaic statutes enacted to meet situations of half a century ago should give way to non-discriminatory provisions recognizing the public interest in utility investment and placing these public utilities on a fair competitive basis in the money market.

Customer ownership should be encouraged in every way, not entirely because it is a source of capital, but because it constitutes the simplest form of actual public ownership and because the reciprocal responsibilities of customers and utility management will thus be emphasized.

The tendency during abnormal times growing out of the war was to seek a remedy for every unfavorable condition through legislation. Commissions, like other boards or administrative bodies, are established in compliance and to comply with the law and constitutional principles. When, as sometimes happens, serious questions arise as to the proper course of administration, such boards or commissions should welcome judicial review and interpretation, and if in the course of an orderly procedure in court for the protection of constitutional rights it shall appear to interested parties that technical or unreasonable rules of evidence are applied believed to be prejudicial, the remedy is not by legislation but by having such rules of evidence duly passed upon by the courts after fair presentation. This government, our institutions, our most highly prized rights, are dependent upon the constitutional and legal provisions for the protection of everybody. Any attempt to change or interfere with the orderly and due processes of courts in maintaining such rights is aimed at the liberties of the people.

Problems of regulation are coming to be better understood, and commissions and courts are breaking away from such doctrines as theoretical loss in value through so-called depreciation and the arbitrary cutting down of legitimate investment for the purpose of meeting a theoretical loss in value having no relation to cost of retirement and that will never occur, which cutting down of investment can only add to any possible difficulty of meeting any loss in retirements if it should occur.

It is to be hoped that the uni-

*Abstract of address before the National Electric Light Association at Atlantic City, N. J., May 18, 1922.

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form system of accounts proposed by the National Association of Railway and Utility Commissioners may be generally adopted and become the basis of a more uniform and fair treatment of such questions. Another error that is sometimes made is in treating "investment" as though it were synonymous with "original cost," the latter term meaning original cost of physical property still existing. Often "investment" and "original cost" may mean the same thing, but sometimes they may be materially different. Investment may be absolutely necessary, especially in the earlier years of enterprise which represents something beside the original cost of tangible property. Most of the commissions have recognized this fact, though no general rule seems to be possible, and the commissions, it seems to me, rightly scrutinize claims of this nature with care, recognizing such claims only where equity pretty clearly calls for that treatment.

Iowa Association Summer Meeting

THE summer meeting and outing of the Iowa Electric Railway Association will be held at the Inn Hotel, Lake Okoboji, Iowa, on June 20, previous to the sessions of the Iowa Section of the National Electric Light Association, and not following them on June 23, as was initially announced. The Iowa railway men will hold a separate session on Tuesday morning, June 20, and in the afternoon will meet in a joint session with the electric light men. The Iowa Section of the N.E.L.A. will hold separate sessions on Wednesday, Thursday and Friday mornings, June 21 to 23 inclusive. The afternoons of these three days will be left vacant for entertainment and recreation of the delegates and their guests.

The tentative program arranged for Tuesday morning, June 20, is as follows:

A paper on "Thoughts on Inspection" by P. H. Diehl, Railway Audit & Inspection Company, Chicago. The following subjects will then be discussed: Fare schedules for street railways; one-man cars; motor vehicle transportation; regulation of rail and motor vehicle transportation; motor vehicle transportation on the public highways.

At the joint afternoon session with the Iowa Section, N.E.L.A., June 20, papers or addresses will be presented as follows:

"The Preparation of a Valuation for Rate-Making Purposes," by L. R. King, appraisal engineer United Light & Railways Company, Davenport, Iowa; "Valuation of Public Utility Property," by H. M. Engh, American Appraisal Company, Milwaukee, Wis.; "Group Insurance for Employees," by Peter F. Bouquet, Metropolitan Life Insurance Company of New York, St. Louis, Mo.; "Customer Ownership of Public Utility Securities," by H. E. Weeks, United Light & Railways Company, Davenport, Iowa; Dwight N. Lewis, chairman Iowa Railroad Commission, Des Moines; "Recent Court and Commission Decisions Affecting Public Utilities in Iowa," by John A. Reid, Iowa Railway & Light Company, Cedar Rapids, Iowa; William Chamberlain, United Light & Railways Company, Cedar Rapids, and George A. Lee, Continental Gas & Electric Corporation, Omaha, Neb. These will be followed by a report of the Iowa Committee on Public Utility Information by F. J. Hanlon, chairman governing committee, Mason City, and Joe Carmichael, director, Des Moines.

New Hampshire Street Railways and Power Developments

AN INTERESTING address on the development of street railways and electric power systems in New Hampshire was presented at the Manchester meeting of the New England Street Railway Club on May 25 by Frederic E. Webster, vice-president and treasurer Massachusetts Northeastern Street Railway, Haverhill, Mass.

According to Mr. Webster, the present electric railways in New Hampshire, with 240 miles, represent the outgrowth of lines started as horse railroads, among them the road in Manchester chartered in 1864, and he declared that a great deal of credit is due to the street railway pioneers of the sixties, seventies and eighties for their public spirit in going ahead with these charters. The first electric railway in the state was the Dover, Somersworth & Rochester, chartered in 1889 and open for business Aug. 8, 1890.

The early street railways were constructed by men who were residents of the towns in which they were located. They had in view the development of these towns more than the net earnings of the road and each stockholder took as many shares as he thought he could afford.

The first report of the railroad commission in New Hampshire was issued in 1884, when the mileage of horse railroads in the state was 12.68. By 1892 there was an awakening as to the part that street railways would play in the growth of a community. At that time there were five roads in the state. By 1896, 60 miles were in operation by seven companies. None of the companies in that year made any allowance for depreciation and only one paid a dividend. In 1902 the "Lovell System," the predecessor of the Massachusetts Northeastern Street Railway, was organized to consolidate a number of the existing properties and build others.

The speaker referred by name to some of the pioneers in street railroading, including E. C. Foster, J. Brodie Smith, Wallace D. Lovell, David A. Belden, Franklin Woodman, Ralph D. Hood and Arthur W. Dean. He also spoke of several of the early railroad commissioners, and reminded his hearers that Moses Gerrish Farmer, born at Boscowen and educated at Andover in New Hampshire, constructed the first electric locomotive.

C. E. R. A. Boat Trip

THE Central Electric Railway Association has prepared the following program for its summer meeting on June 25-30, to be held on the S.S. *South American*, while cruising the Great Lakes.

SUNDAY, JUNE 25

3:30 p.m.—Song service for children in grand salon.

7:30 p.m.—Address by J. A. McGowan, secretary - treasurer Terre Haute, Indianapolis & Eastern Traction Company.

TUESDAY, JUNE 27

9:30 a.m.—Meeting of directors of the Engineering Council.

10:30 a.m.—Meeting of the executive committee.

2:30 p.m.—Committee reports as follows:

"Auto Transportation," by Zenas W. Carter, the White Company, Long Island City, N. Y., followed by discussion.

"The Weekly Pass," by S. W. Greenland, vice-president and general manager Indiana Service Corporation, Fort Wayne, Ind., followed by discussion.

"Development of Interurban Freight," by Bert Weedon, traffic manager Interstate Public Service Company, Indianapolis, Ind., followed by discussion.

WEDNESDAY, JUNE 28

2:30 p.m.—Program in charge of the Engineering Council, as follows:

Report of the chairman, by Harry Reid, president Interstate Public Service Company, Indianapolis, Ind.

Reports of sectional directors—Eastern section, by P. V. C. See, superintendent equipment Northern Ohio Traction Company, Akron, Ohio; northern section, by E. B. Gunn, superintendent transportation Western Ohio Railway, Wapakoneta, Ohio; western section, by A. Schlesinger, superintendent substations and distribution Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; southern section, by W. A. Coleman, superintendent and master mechanic Dayton & Western Traction Company, Dayton, Ohio.

"Current Saving Devices on Cars," by Frank H. Miller, vice-president Louisville Railway, Louisville, Ky., followed by discussion.

"Metals for Car and Power House Bearings," by H. H. Buckman, United Lead Company, New York City, followed by discussion.

THURSDAY, JUNE 29

2:30 p.m.—"Gear Economies Through New Tooth Shapes," by E. S. Sawtelle, assistant general manager the Tool Steel Gear & Pinion Company, Cincinnati, Ohio, followed by discussion; "Light-Weight Interurban Cars," by F. E. Wynne, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., followed by discussion; "Comments on Car Ventilation," by W. McK. White, president White Manufacturing Company, Goshen, Ind., followed by discussion.

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Recent Happenings in Great Britain

Peace in the Tramway Industry — Company Buses and Municipal Tramways—Track Renewal Troubles

(From Our British News Representative)

THE National Joint Council for the tramway industry has been informed that the new agreement as to working hours, particulars of which I gave a month ago, has been accepted by the parties concerned. There was no dissentient among the municipal tramway authorities, and a conference of tramway companies had recommended the adoption of the agreement. The employees by a majority had also accepted it. There is thus now no general matter in dispute between employers and employed in the British tramway field, though of course local disputes may arise from time to time. The National Joint Council is to be congratulated on the result of its efforts.

Tramways Association Considers Buses

It may be recalled that some time ago the Municipal Tramways Association became concerned over a power evidently given by the Roads Act, 1920, to the Minister of Transport to authorize companies to run buses against the wish of municipalities and it might be in competition with municipal tramways. A case in point is now reported from Newport, Monmouthshire. The Town Council there works a tramway, while a company called the South Wales Commercial Motors, Ltd., runs buses between Newport and Chepstow, a distance of 20 miles. The company applied to the Council for licenses to run buses within the borough of Newport, and the Council refused to grant the licenses. The company, thereupon, under the Roads Act, appealed to the Ministry of Transport. After the Minister had considered the case, he informed the Town Council that he was of the opinion that reasons given by the Council did not justify its decision to refuse to grant licenses to the company to run its interurban bus service into the center of the borough. The Minister considered that the licenses should be granted on conditions and that the Council should issue the licenses.

Cost of Living Index Down

It would appear the company has a good case for the limited service proposed within the borough. In other towns in England a similar arrangement exists, and the Town Councils can, if they think it necessary, protect their local tramway services by providing that the buses shall charge higher fares than the tramcars for journeys begun and ended inside the borough, or that there should be no picking up by the buses in the borough on the inward journey and no setting down on the outward.

In consequence of a further fall in the cost of living index figure to 82 per cent above August, 1914, British tramway employees in the beginning of May suffered a further reduction in wages of 2s. a week, making the total reduction from the peak limit 10s. a week.

The Manchester City Council has approved a recommendation by the tramway committee for a reduction of fares by increasing the length of the penny stages from 1¼ miles to 1½ miles. This is a reversion to the charges before the last increase was made, and for the present is regarded as experimental only.

The Wolverhampton municipal point of view as to reductions in fares is interesting. The Town Council has agreed to reduce the present 2d. minimum tramway fare to 1½d., though the manager estimates that the retention of the 2d. minimum would produce a credit balance of £8,438 and that the substitution of the 1½d. minimum will result in a deficit of £3,562. The reason advanced for reducing the fare is the over-riding necessity to make every possible contribution to a furthur fall in the cost of living.

Track Renewals a Problem

The Town Council of Croyden is in difficulties over the question of the renewal of its tramway tracks, which are badly worn. Croyden is a large borough lying to the south of London and there are buildings practically all the way between the metropolis and Croydon. The main London and Brighton public road passes through the borough and forms the main street in it, along which the principal tramway route runs, and is continued south to Purley. The London County Council Tramways extend as far south as the northern end of the Croydon tramways. Along this great thoroughfare there is a large traffic of buses and other heavy automobiles which help to wear out the tramway tracks.

The Town Council recently received a report on its tramway undertaking by James Dalrymple, general manger of Glasgow Corporation Tramways, and R. J. Howley, M. Inst. C. E. The report states that to reconstruct the present system and to continue to work it as hitherto would result in a net loss to the rate payers of about £18,000 a year. They cannot recommend railless trolley buses as suitable to the conditions. Motor bus powers within the borough would only be useful in substitution of local services which are reasonably profitable. They do not think powers cou'd be obtained to work buses outside the borough. The tramway service through Croydon to Purley should be a through service from London and could best be given by the London County Council Tramways. Should this arrangement be carried out, the suggestion is made that the Town Council close its undertakings and arrange for the working of the local services by the London County Council or the South Metropolitan Tramways. Should through running not be arranged with the London County Council, it is suggested that negotiations be opened with the London Underground group to provide an adequate service of buses between London and Purley, the local services to be worked by the South Metropolitan Company. Any arrangement should be on the basis that the rental paid should free the Council from cost in respect of maintenance and capital charges. Under different schemes, deficits on working are estimated.

Tenders Invited for Tramway Material

For the purpose of obtaining certain classes of tramway stores, materials, etc., the practice of the highways committee of the London County Council is to invite tenders from selected firms. In this connection the committee has announced that it will not at present include the names of foreign firms in the selected lists of tenders. In cases, however, where there is reasonable ground for believing the tenders are not being submitted on an independent basis and that advantage is being taken of the limitation to British firms, the committee will not hesitate to invite tenders by advertisement. In that case foreign firms will be at liberty to tender equally with British firms.

The Leeds City Tramways, though a large and well managed undertaking, is not yet restored to a very prosperous condition. The total revenue for the year ended March 31 last was £959,703, being a decrease of £35,934 compared with the previous year. As there was a reduction in the mileage run, however, the receipts per car mile of 24.695d. showed an improvement of 1.215d. per car mile. The working expenses were £702.250, being a decrease of £27,095. Thus the gross surplus was less than £9 000. The working expenses equaled 18.07d. per car mile, an increase of 0.87d. After allowing for capital charges, income tax, permanent way renewals, etc., there was a deficit of £43,266, against a surplus in the previous year of £5,622.

Directors Recommend 5 per Cent Dividend

The report of the directors of the English Electric Company for 1921 shows that the net profits were £317,423. After deducting preference dividend and interest, there remains an available balance of £168.852. The directors recommended a transfer to reserve of £60.000 and a dividend on the ordinary shares of 5 per cent (less tax), leaving £55.599 to be carried forward. A year ago the dividend on the ordinary shares was 8 per cent.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Strike a Political Issue

Men in Employ of New Brunswick Power Company Carry Their Fight Against Road to the Public

Strikes that continue for a year are unusual. There has been one up at St. John, N. B., that has extended almost this long. This is true, however, only technically, for so far as the New Brunswick Power Company is concerned the effort of the employees to tie up operations failed and has become a thing of the past. The strike remains as an issue in political circles, however. It is for this reason alone that a recital of the facts is of interest.

About a year ago the New Brunswick Power Company announced its intention of converting the rolling stock for one-man operation. The motormen and conductors protested. The case was taken before the City Council by the union among the railway men, but the Council after an inspection of the rolling stock decided not to forbid the conversion of the cars and their operation by one man.

Official Remains Firm in Stand

The motormen and conductors threatened to strike if the one-man cars were placed in operation. General Manager Thomson remained firm in his determination to operate one-man cars and instructed employees who were unwilling to operate such cars to turn in all paraphernalia belonging to the company. The carhouse was placed under guard and no motorman or conductor was permitted on the property unless he was willing to operate a one-man car. This, however, was not the only issue involved in the controversy. On June 4 the agreement of the company with the union expired. The company gave the usual thirty days' notice that it did not intend to renew the agreement. Numerous consultations and meetings were held in an effort to institute a working agreement, but all of these failed. The company desired to reduce wages from 10 to 20 per cent. This phase of the controversy was referred to in the Electric Railway Journal for Aug. 6, 1921, page 217.

The company styled the situation a strike and the men termed it a lockout. Anyway, cars were not operated for a week. In a few days many jitneys were in operation in St. John and in the suburbs.

Jitney Company Organized in Opposition

Several of the old motormen and conductors remained at work and in a week service was restored on the railway. Traffic fell off to practically nothing. The former railway employees, reinforced by men employed at the power plants, gas works and in the maintenance department, all of whom also went out, organized a jitney company. Sixteen trucks were bought and placed in operation on lines paralleling the railway, but the rigorous northern winter soon created havoc with the trucks.

Meanwhile traffic on the street railway had started to improve and by Jan. 1 it was back to normal. For the most part the men imported from Montreal and Toronto and from near-by towns were being used to operate the cars, although about fifteen of the strikers returned to work.

The strikers are still very active against the company. When the company sought to gain control of the hydro-electric current from the new station at Musquash, erected by the Provincial Government, the former employees fought this strongly. At the polls Mayor E. H. Schofield, who advocated handing over the distribution of the current in St. John to the company for a period of at least two years, was badly beaten recently by H. R. McLellan, who advocated civic distribution of the current from Musquash. The striking motormen and conductors worked for many months to defeat the efforts of the power company.

High Scale Being Demanded

Electric railway employees of the tricities, Davenport, Iowa, and Rock Island and Moline, Ill., are asking a top scale of 68 cents an hour as the new rate to take effect on June 1, when the present contract expires. The top scale is now 55 cents an hour and the operation in the tricities is entirely under the one-man system. It is reported that the Tri-City Railway will refuse to pay the increase demanded and will insist on a reduction of at least 5 cents an hour. The respective plans of the two sides in regard to the new scale, however, have not interrupted friendly relations and both sides are confident of arriving at an agreement without a break in negotiations. So far minor working conditions have been considered.

Negotiations are being conducted separately with the men of Illinois and with the men from the Iowa lines. The scale and the working conditions, however, will be identical. The men at first asked for a five-year contract, urging that the reopening of the wage question annually would do neither side any good and suggesting that a long term agreement would be most satisfactory to each. This demand has been refused by the Tri-City Railway, which will insist on holding to the old contract length, one year.

James Forrest Lecture

Whole Field of British Transport Is Covered by Sir John Aspinall Before Civil Engineers

Sir John Aspinall, formerly engineer and general manager of the Lancashire & Yorkshire Railway, on May 2 delivered the annual "James Forrest" lecture in connection with the Institution of Civil Engineers. In this he ranged over the whole field of British transport, and also made references to other countries, and dealt largely with conditions of steam railway workings and traffic.

In reference to the forthcoming amalgamation (under the provisions of the Railways Act) of the London & South Western, the London, Brighton & South Coast and the South Eastern & Chatham Railways, he made an interesting suggestion as regards Waterloo Station, the London terminus of the London & South Western Railway, which is used both by the long-distance steam trains and by the suburban electric trains. He said that this station could be made the point of departure and arrival for Continental services of the three railways, provided that the electric services now running into the station could be accommodated elsewhere.

It was very generally admitted that these local services would be much better dealt with by an arrangement of lines ending in a loop, so that there would be no crossing of incoming and outgoing trains. In regard to the extension of electric working to main line traffic, he had no hesitation in saying that there were numerous cases in Britain where expenditure under this head would be found most remunerative, especially for traffic transporting goods.

In reference to the question of traffic in London Sir John said that notwithstanding the great capacity for handling traffic possessed by the most modern omnibuses, mainly over very short distances, the extension of railway facilities for London was an urgent necessity.

The capacity of a tube train carrying 400 or 500 people, with such trains succeeding one another at intervals of about 1½ minutes, was required to deal with the rush of travelers morning and evening, most of whom were showing more and more desire to get well out of London.

He would not despair of some first-rate scheme being adopted for future gradual development, if it were in the first instance considered by a strong committee of those engaged in handling London traffic, and then legalized with a view to its being financed and carried out in sections.

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Dishonest Conductors Caught

Device in Fare Box Traps Conductors Who Are Caught in the Act of Stealing

Two conductors on the Municipal Railway, San Francisco, Cal., who were suspected of stealing from fare boxes were recently caught red-handed in a trap set by officials of the road. The trap involved the use of a device placed in the fare box in such a way that once the box was opened it could not be reassembled. Both men pleaded guilty and told how details of the plan, involving other conductors and a car dispatcher, were arranged and carried out.

The original suggestion of dishonesty, it is alleged, came from the dispatcher. He is said to have recommended to two conductors assigned to the last runs at night that they leave money in the fare box above the registering device when turning in the fare boxes at the end of their runs. This money would not show on the register and could be taken by the dispatcher when he made his nightly round of inspection to remove from the fare boxes the pennies, etc., that would not go through the registering device.

METHOD EXPLAINED

After collusion on this score the conductors felt that the dispatcher would not dare to expose them for tampering with the fare box seals and proceeded to take money themselves. To avoid detection in this they allowed coins to accumulate in the fare box above the registering device, whence they removed them at the outer ends of their run after forcing open the boxes.

The fare boxes used on this system are of the type in which the interior of the box is accessible when the bolt which holds the mechanism in place is removed. This bolt is fastened with a lead seal impressed on twisted wires. After forcing this seal off the wires with pincers the conductor opened the box, removed the cash and after putting the box together again pinched the same lead seal back on the wires.

The two conductors were in the habit of doing this once each night immediately after the evening rush hour and at the end of the line, where there were ordinarily no passengers on the car. Except for this rush hour defalcation, other fares going into the box were registered by turning the handle as usual. In making their daily reports at the carhouse the men arranged their records so the fares which they had actually registered were distributed over all trips in accordance with the usual traffic variations, thus making it possible for each man to take several dollars a day without making any suspicious entry in the trip records.

The trap set to catch the dishonest conductors consisted of a pair of lugs attached to the inside of the fare box in such a way that when the bolt was removed the lugs sprung into the bolt's passage-way and prevented its being returned to place in the usual manner. When the trap was set both men were caught in the act on the same evening, both pleaded guilty and were given suspended sentences of six months. It was not considered worth while to prosecute the case against the other employees involved and they were simply discharged.

The plan of detection was devised by the superintendent of the San Francisco Municipal Railway, who personally apprehended the conductors. The master mechanic developed the device which was used as a trap in the fare box.

Philadelphia Wages Cut

The Philadelphia (Pa.) Rapid Transit Company has announced a new maximum wage rate, effective June 1, of 62½ cents an hour for surface motormen and conductors. This is a reduction of 1½ cents an hour, the present rate being 64 cents. Elevated railway motormen and guards are also reduced and way department and shop men are cut 1 cent an hour. The co-operative plan for collective bargaining of the Philadelphia Rapid Transit Company provides as a basis for determining wages the average of wage scales of street railway companies in Chicago, Detroit, Cleveland and Buffalo. The present reduction on Philadelphia Rapid Transit lines is in conformity with the wage decrease of the Cleveland Railway.

Wage Matter Goes to Arbitration

An agreement was signed at New Haven, Conn., on May 29 submitting to arbitration the wage differences of the Connecticut Company trolley men with the company. Judge J. K. Beach, Joseph F. Berry, counsel for the Connecticut Company, and James H. Vahey, Boston, representing the trolley men, will constitute the arbitration board. Officers of the local association of the trolley men's union have expressed satisfaction over the personnel of the board. At present, men employed more than one year by the company receive a maximum of 55 cents an hour and the new scale offered by the company, but rejected by a heavy vote, calls for a scale of 50 cents.

Wage Scale Will Continue

The current wage scale of Evansville, Ind., street car and interurban motormen and conductors will be continued for the year beginning June 1, according to announcement of officials of the Southern Indiana Gas & Electric Company. The scale for two-man city cars in cents per hour is as follows:

First six months	36
Second six months	37
Second year	38
Third year	39
Fourth year	40
Fifth year	41

Operators of one-man city cars 4 cents an hour additional.

Interurban conductors and motormen, 2 cents an hour more than two-man city scale.

The current agreement, which was negotiated last year, represents a reduction of 9 cents an hour from the wartime peak.

Relief Sought from Paving

Officials of Charleston Property Claim Paving Obligations Unfair—Railway Not Making Expenses

The City Council of Charleston, S. C., has been asked by the Charleston Consolidated Railway & Lighting Company to be relieved of that part of its franchise which requires the corporation to pave between its tracks and for 3 ft. on each side. It is contended that the conditions which caused this provision have changed and that it is no longer fair for a railway to be required to pay such a heavy toll.

The petition recites that although the railway during 1921 failed by $29,820 to meet its operating expenses, it paid in city and county taxes the sum of $44,875 and that, in spite of discouraging conditions, the corporation strived to improve its equipment. It is recited that the recent Meeting Street paving improvements cost the company $99,300, $41,500 for the paving and $57,800 for roadway improvement made necessary by the paving.

The company says that a forecast of the future indicates that the operations of the year 1922 will result in an operating loss, due not so much to temporary business depression as to the actual decrease in the number of riders, occasioned by the large number of private automobiles.

It is explained that while the company is in thorough accord with the improvement program now being carried on, it finds itself in an unfortunate position, in that the proposed improvement involves the expenditure, and consequent future financing, of an amount conservatively estimated at $358,000 by a railway which is not making its operating expenses—an expenditure which will in no way increase its operating revenues, but will entail an indebtedness and fixed charge of that sum on the company.

ACTUAL PAVING COST $237,000

Of this sum $237,000 is the estimated cost of the actual paving, while the remaining $121,000 represents the lowest possible cost of preparing the roadways for paving, assuming that the company utilizes all the existing rails and materials now in reasonably good shape. This paving charge provides paving a second time streets in which there now exists paving paid for by the company in the amount of $73,094.

The company says that the petition is made in the hope that there may be worked out an equitable situation under which it can continue, in these changing times, not only to render service to the people of Charleston but to meet the demand for extended facilities and improved service which will be made upon it as the city grows and develops.

In asking earnest consideration of the petition, the company says it stands ready to furnish the city with any facts or figures at its command in regard to railway operation.

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Railway Experiments With Radio Telephone

Possibility of using the radio telephone so that the crew of a traction car equipped with a standard wireless set may be in constant communication with the dispatcher while standing or running has been demonstrated by Fred C. Manson, superintendent of distribution of the Monongahela Power & Railway Company, Fairmont, W. Va. Experiments made indicate that it is possible to use the trolley wire for the antenna, or to employ the system termed "wired wireless." Mr. Manson declares that he has carried his experiments far enough to believe that it is now possible to equip cars with standard sets, augmented by some special apparatus, and make continuous communication practical.

"Co-operative Courtesy, Mutual Helpfulness Will Improve Service"

"The Wayfarer and the Fare" should be an inspiration to every employee of the Grand Rapids (Mich.) Railway. It is an attractive fifteen page booklet—the work of L. J. DeLamarter, vice-president and general manager of the Grand Rapids Railway. It emphasizes and brings home to every employee his responsibility in the successful operation of the railway—selling a real service. He tells the men not to add to the problem of the company by giving a wrong impression regarding the company's aims. In part he says:

> If you cannot get "in tune" with the street railway company, if you are not in sympathy with it, you do yourself a great injustice by remaining on its pay roll. The money you receive for services which you cannot render with a free will and whole heart will never do you any good.

Cheerfulness in the performance of duty he considers of utmost importance in increasing the number of friends for the company and for the men themselves. In conclusion he says:

> No matter what your philosophy may be, or how you regard the public or your particular position in the Grand Rapids Railway, let us all unite on our motto and keep it before ourselves and those we aim to serve and agree with Lincoln that "angels can do no more."

No Referendum on Akron Grant

The City Council of Akron, Ohio, on May 23 rejected the ordinance calling for a referendum vote on the two-year 5-cent fare franchise recently granted to the Northern Ohio Traction & Light Company. City Law Director H. M. Hagelbarger explained to Council that through a mistake of the city legal department it had been publicly announced that following Council's decision on May 23 the citizens of Akron would themselves have thirty days more in which to circulate referendum petitions if they desired. He said that a supreme court decision bearing on the case requires popular referendum petitions to be circulated in accordance with the state constitution instead of under city charter rules. The state law stipulates that the petitions, which in this case must carry 4,000 names must be filed with the council clerk within thirty days after the passage of the ordinance upon which the vote is to be taken. This thirty-day period has already expired.

Get-Acquainted Gathering

On April 20 the East St. Louis (Ill.) Railway held a "get-acquainted gathering" on the fourth floor of the office building. In addition to department heads and transportation supervisors W. H. Sawyer, president of the company, sent an invitation to all conductors and motormen personally commended by him during the year. All the men in the company who were invited were requested to bring with them some member of their family or some particular friend. An entertainment started promptly at 8 o'clock, but Mr. Sawyer expressed the hope that the men would be able to get there before that time so that he might have the opportunity of personally welcoming them.

Radio May Make Possible More Efficient Use of Line Crews

Rather successful experimenting has been done by H. M. Gould, electrical engineer Department of Street Railways, Detroit, Mich., looking toward the possibility of equipping line cars and trucks with radio receiving sets so that the main office may keep in communication with the crews.

The study is being made because of the obvious advantage of being able to utilize the spare time of emergency crews for doing maintenance work. A Ford truck equipped for emergency line work was used to determine the possibilities of applying radio. It was fitted with an aerial 4 ft. square which worked most effectively when placed flat over the top of the truck roof. This aerial or antenna was made up of 500 ft. of No. 14 bare copper wire with the turns spaced about $\frac{1}{2}$ in. apart over the plane of the square. It was connected to the set by four taps taken off the aerial at equally distant points and connected in parallel. The frame of the truck was used as the counterpoise. The set comprised a two-stage amplifier with regenerative circuit, employing three "radiotron" UV-201 G. E. tubes. This set was built by L. R. Wagner, assistant engineer.

It was found possible to communicate with the line crew when 7 miles from the sending station. The set was found to be very noisy when the truck stood under the trolley wire or under the 23,000-volt a.c. line, though the interference was less under the latter than under the trolley line. Despite this noise in the receivers it was entirely possible to communicate orders to the crew. The problem of broadcasting orders was solved in this case by the offer of the Detroit *News* to broadcast the message. The *News*, according to the law, ceases its news broadcasting for 2 minutes every 15 minutes and it was during these intervals that orders to the crew were transmitted, during the experiments.

Announces Petition for Rehearing Taxpayers' Case

Further interpretation of the Supreme Court's recent decision in the Fourteen Taxpayers case, to determine the status of tax-supported departments which perform work for the Seattle (Wash.) Municipal Street Railway, will be sought in a petition for a rehearing of the case, Corporation Counsel Walter F. Meier announces. The statement came in a legal opinion Mr. Meier gave to Chairman Oliver F. Erickson of the council utilities committee, regarding the segregation of accounts of the law, accounting and purchasing departments as to expenditures made in behalf of the street railway. Until a further interpretation of the court's meaning is obtained Mr. Meier said, he takes the view that the city is not enjoined from paying for the railway's legal, accounting and purchasing work out of the general fund.

Mr. Erickson's request for an opinion arose out of Mayor Hugh M. Caldwell's announcement that unless the expenditures of the tax-supported departments for the railway are segregated so that they may be paid out of the railway receipts, he will not approve the salary and appropriation ordinances for the May 25 disbursements.

Court Reduces Chicago Fare

The Federal District Court on June 1 ordered a reduction in fare on the Chicago Surface Lines from 8 cents to 7 cents cash, or three tickets for 20 cents, effective June 15. No detail decision giving reasons for the action was rendered. A formal order is to be issued later.

The three judges sitting on the appeal were not unanimous in granting the interlocutory injunction against the 6-cent fare ordered by the Illinois Commerce Commission. Judge Geiger held that the injunction should not be granted, which presumably means that he did not consider a 6-cent fare confiscatory. Judges Page and Evans favored the injunction only on condition that the fare be made 7 cents with the reduced ticket rate. The question of a permanent injunction will be next in order before the court. Attorneys for both the city and railway hold that the Federal Court had no power to fix rates. The sequence of events has been a 5-cent fare order, enjoined by the court; a rehearing and a new order for 6 cents, with a new appeal by the company.

Wage Conferences Started.—Negotiations have begun between the Berkshire (Mass.) Street Railway and its employees relative to a new wage schedule to replace the present scale expiring June 1. The pay is now 53 cents an hour for a nine-hour day. It is stated the men seek an increase, while the company desires to reduce the rate. A year ago a reduction of 10 per cent was instituted.

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Service-at-Cost Grant Held to Be Illegal

The Third District Court of Appeals on May 22 reversed the judgment of the Common Pleas Court which had held legal the year-old service-at-cost franchise in Findlay, Ohio.

The new grant, passed in February, 1921, increased fare and relieved the Toledo, Bowling Green & Southern Traction Company from paving between its tracks.

Attorney George H. Phelps attacked the new grant on the ground that Council exceeded its authority in creating a railway commission named by the Mayor, which regulates service and supervises the system finance. The company's counsel announced that the case will be appealed immediately to the Ohio Supreme Court.

The service-at-cost franchise in Findlay, which the court held to be illegal, was contested on the ground that it conflicted with Section 3771 of the state code. This section forbids city councils to relieve street railway companies of any of the obligations under existing franchises.

The Findlay service-at-cost franchise, adopted in 1919, had been superimposed on one granted in 1915, which was for a term of twenty-five years.

Under the 1915 Findlay franchise the company had been obligated to provide a 5-cent fare and to relay paving between the tracks. The street railway commission of three, established under the new franchise, had allowed the fare to be increased to 10 cents cash or seven tickets for 50 cents.

These acts of the Street Railway Commission were held to relieve the street railway company of its original franchise obligations and the court declared the Tayler mode of procedure, as applied to Findlay, illegal.

Announces Wage Reduction of 12½ per Cent

The Board of Conciliation and Investigation, appointed under the Industrial Disputes Act of Canada in April, 1922, to investigate a dispute as to wages between the Ottawa Electric Railway and some of its employees, who are members of Division 279 of the Amalgamated Association of Street Railway Employees, has made its report. The board has recommended a general reduction of 12½ per cent in wages and a continuance of the nine-hour day, leaving other working conditions as before. This award has been accepted by the company.

At a mass meeting held on May 27 the men rejected the award, but this rejection apparently amounts to accepting it under protest as there is no word of any further action on their part.

The company on May 29 announced by bulletin the reduced scale of wages which for carmen is 43, 45, 46 and 48 cents an hour for first, second, third and fourth year service. This represents a reduction of 7 cents an hour on the old rates. A general reduction of 12½ per cent has been put into effect in the other departments.

Real Estate Association to Aid Trolley Fare Cut

The California Real Estate Association through its transportation committee has definitely decided to back an initiative amendment to the California State Constitution. In a statement issued by Guy W. Wolf, director of research for the association, it was shown that the "electric railways affected have given assurance that if they are relieved of some of the burdens of highway construction and maintenance they can operate at reduced fares and at a profit. Under these conditions California cities and towns can secure transportation they need and which they are unable to get so long as present conditions continue."

It was brought out in the statement that this proposed amendment is of direct importance to every real estate operator and property owner and that improvements and extensions in electric railway service will mean not only increased business but will also add to the assessment roll of the communities affected as will result in materially decreased taxes.

Railway Employees Make 100 per Cent Showing in Basketball

The basketball team representing the shops of the Reading Transit & Light Company, Reading, Pa., recently closed a successful season. Twenty-seven games were played and nineteen of them resulted in victories for the Reading Transit & Light shopmen, who scored 774 points to a total of 664 for their opponents. The latter included some of the strongest semi-professional clubs in Reading and vicinity, where basketball is an unusually popular sport.

It was the first season for the mechanical men on the basketball court, and they were late in starting. Most of the eight games that were lost were played early in the schedule, before the players had gained experience. All workers in the shops were invited to try for positions, and those who did not make the team were generous in supporting it. At the close of the season the members of the team were the guests of their fellow-workers at a banquet to celebrate their good record.

Home games were played every Thursday night in the large recreation hall provided for Reading Transit & Light Company employees. There was always a large attendance. A number of contests were also played in nearby towns reached by interurban car lines.

The team was made up of L. Heere and R. Whitman, forwards; L. Shrope and W. Dillon, centers; Captain Bierbower, Beyerle, Madara and C. Meyer, guards; and H. E. Aldrich, manager. The line-up will be unchanged next year.

News Notes

Appointment Made.—It was recently announced that Homer Loring, chairman of the trustees of the Eastern Massachusetts Street Raliway, has been appointed chairman of the transportation committee of the Boston Chamber of Commerce. The place was formerly held by Stanley King, who resigned.

City Seeks Suit Dismissal.—The city of New York in answer to the $30,000,000 suit of the Brooklyn Rapid Transit Company for alleged failure to carry out obligations of the subway contract has sought a dismissal of the suit. The city charges the company with failure to carry out the contract and scores the company's poor service and equipment.

D. U. R. Offices Being Removed.—The general offices of the Detroit (Mich.) United Railway and allied companies are in the course of removal from the Detroit Interurban Building, Detroit, to new quarters in Traction Building, at Third and La Belle Avenues, Highland Park, Mich. The Interurban Station, Detroit, will remain at its present location.

Rules Merger Is Legal.—The District of Columbia Commissioners have transmitted to Congressional committees considering the proposed merger of the two street railway companies in Washington, an opinion of Corporation Counsel F. H. Stephens to the effect that the companies have under existing law the power to merge. The Public Utilities Commission of the District has concurred in the opinion. There had been dispute as to whether there was sufficient authority under present law to permit the merger.

New Publication Needs a Name.—With the temporary title of *Wanted a Name?* the forty-page monthly magazine of the Market Street Railways has been introduced to employees of the company, "of, by and for" whom it is published. F. J. Linforth is editor, and Charles C. Stech associate editor. Because the purpose of the magazine, as the first editorial states, is to make the co-workers better known to each other, a large part of the issue is devoted to departmental and division news. The first issue bears a March date line.

Bonus Goes to Many Men.—The results of the first month of the bonus plan for employees of the Georgia Railway & Power Company, Atlanta, Ga., were very gratifying to the management. There were 564 trainmen who succeeded in having a no-accident record for the month of April as well as a month without any infringement of company rules against their names, and to them a bonus of $3 was awarded. The purpose of the bonus primarily is to stimulate motormen and conductors to 100 per cent in carefulness in order to avert accidents.

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Financial and Corporate

Approves Bond Issue

Community Traction Company Will Repair Streets—Financing Not Completed—Surplus for April Reported

The City Council at Toledo, Ohio, at its last session finally approved a bond issue of $100,000 to provide funds for the repaving of many streets on which street railway improvements to the extent of $750,000 are contemplated this summer. The fund is to take care of the pavement between the rails the cost of which was formerly charged to the railway. Under service-at-cost operation it was a question as to whether the cost of repaving between rails should be borne by the car riders or by the city as a whole and the automobile riders who use that path. Street Railway Commissioner W. E. Cann appeared before Council and its committees several times and finally won his contention that the city as a whole should pay for the cost of the paving between the rails.

The money to be used by the railway for its improvement program, under the terms of the ordinance, will have to be furnished through the sale of the 8 per cent preferred stock of the Community Traction Company. Definite arrangements for this financing have not been made yet, but President Frank R. Coates and the street railway commissioner will probably discuss the matter soon.

At the recent meeting of the board of control of the street railways there was reported a surplus after operations for April amounting to $14,433, which brings the stabilizing fund up to $114,396. The month's credit was an increase of $884 over the previous month. Gross revenue for April amounted to $304,306 as compared with gross revenue of $307,827 for the month of March. The ratio of operating expenses to gross revenue was 68.429 per cent, which is an improvement over the previous month's ratio of 69.405 per cent. Total passengers carried during April fell off 390,473 as compared with March to a total of 5,322,832 passengers. Despite the decrease in riding a surplus was shown as compared with a deficit of $72,730 for the same month last year. Interest earned on retired bonds amounted to $745 for the month. This was added to the sinking fund.

Street railway board members believe that the increasing number of automobiles and the growing tendency to pick up riders is causing a loss in passengers to the street cars.

The industrial position of the city has greatly improved during the last two months and there are indications that more workers are riding the street cars but in other lines the patronage has fallen off.

One-man cars are to be placed on the Bancroft line for experimental purposes.

Railway Operating at Loss

According to figures filed with the Railroad Commission of Wisconsin the Superior division of the Duluth Street Railway is again operating at a loss. The deficit for the month of February amounted to $1,601. After the 6-cent fare became effective on Sept. 1, 1921, the property began to show a slight profit over operating expenses, but officials attribute the falling down again in part to the general depression and to automobile competition. When the commission fixed a 6-cent fare in Superior it was estimated that it was the fare required to yield an operating income of $76,560 a year, which was held a reasonable return on the valuation fixed by the commission.

Accidents Decrease in Pennsylvania

The Bureau of Accidents of the Public Service Commission of Pennsylvania has compiled some interesting statistics on the number, distribution and causes of accidents in the State of Pennsylvania for the year 1921 in comparison with 1920. Accident prevention campaigns and safety first propaganda were no doubt instrumental in reducing total number of accidents from 2,311 in 1920 to 1,676 in 1921. The accompanying table presents the story in detail.

City Council Will Pay $18,000 to Complete Valuation

The Minneapolis City Council has agreed to pay Delos F. Wilcox $18,000 to complete valuation of the Minneapolis Street Railway property, which will make the total $136,000. He will also testify before the Railroad & Warehouse Commission of the state when that body takes up the hearing on the valuation preparatory to fixing a reasonable fare, which is now 6 cents, while Dr. Wilcox and the city attorney, Neil M. Cronin, are under Council instruction to get a 5-cent fare rate, or as much less as the valuation of the property and returns thereon will justify. Of this $18,000, $10,300 came from the bond appraisal fund, $500 from the street railway inspection account of the current expense fund, and the $7,200 was referred to the ways and means committee to raise. In 1921 the city expended about $4,000 city funds on the valuation and $57,000 was provided by the street railway. The company will furnish $57 000 of the amount to be expended this year and the city the remainder.

Statement Shows Improved Financial Condition

For the twelve months ended Dec. 31, 1921, the report of the Hudson & Manhattan Railroad, New York, N. Y., shows total railway revenues amounting to $7,683,662, against $6,838,269 in 1920. The surplus after bond interest adjustments was $331,823, against a deficit for the year 1920 of $1,058,369. The report to the stockholders states that the continued growth of traffic necessitated additional cars. An order for twenty-five new cars was p'aced on Dec. 31, 1921. They are to be delivered during the early fall of the current year. The cost of the new cars will be $515,000, or $200,000 less than the cost of the same number purchased in 1920.

ACCIDENTS ON STREET RAILWAYS IN PENNSYLVANIA

Number of Accidents 1920	1921	Cause of Accidents	Employees 1920 Killed	Employees 1920 Injured	Employees 1921 Killed	Employees 1921 Injured	Passengers 1920 Killed	Passengers 1920 Injured	Passengers 1921 Killed	Passengers 1921 Injured	Trespassers 1920 Killed	Trespassers 1920 Injured	Trespassers 1921 Killed	Trespassers 1921 Injured	Others 1920 Killed	Others 1920 Injured	Others 1921 Killed	Others 1921 Injured	Total 1920 Killed	Total 1920 Injured	Total 1921 Killed	Total 1921 Injured
144	55	Collision of cars	5	34	4	15	20	616	4	245				1	1	2	2		26	652	10	261
24	9	Grade crossings (other than streets)				2									14	39	6	15	14	39	6	17
87	41	Derailments		5		1	2	199		104						14		5	2	218		110
11	7	Repair work on right of way		11	1	6														11	1	6
14	9	Struck by overhead or side obstruction		2		2	1	7		5		2		2		3			1	14		9
8	3	Contact with trolley or feed wire		1		1									6	1	1	1	6	2	1	2
	1	Contact with third rail												1								1
91	83	Falling within cars		1		2		90		86										91		88
41	41	Defect or failure of roadway or equipment		6		6		68		53		3				1		5		78		64
1	1	Persons on running boards						1		1										1		1
673	469	Collision of car and vehicle (on streets)	1	10		8		77		38	1	2			22	842	22	648	21	931	22	694
693	536	Struck by car	1	3		3		23	1	21	2	6	6	10	99	557	86	423	102	589	93	457
250	212	Falling from car		3	1	7	1	238	1	199		8		4				1	1	249	2	211
115	99	Jumping on or off car				3	3	107		93		2		3		5		1	3	114		100
159	110	Miscellaneous	1	26		22		107		78		2	1	1	3	29	3	20	4	164	4	121
2,311	1,676	Total	8	102	6	78	27	1,533	6	923	3	25	7	22	145	1,493	120	1,119	183	3,153	139	2,142

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Railway Corporation Will Pay Heavy Tax

Street railway corporations and gas and electric light corporations of New Jersey will pay a total tax for the present year of $3,167,745 on their gross receipts. The tax takes the place of a personal property tax. The total for this year is an increase of $285,955 over the 1921 tax. It was levied against eighteen street railway companies and seventy-three gas and electric light corporations. It is entirely distinct from the franchise tax levied on the gross receipts of all utility corporations at the rate of 5 per cent for those companies having over $50,000 gross receipts and 2 per cent for those having less than $50,000 gross receipts. Of the total tax, $2,584,549 will be paid by the Public Service Corporation. The Public Service Railway will pay $911,238.

Small Surplus Realized

The report of the Christchurch Tramways, Christchurch, New Zealand, for the year ended March 31, 1921, shows a credit balance of £885 plus, small, in view of the total earnings from operations, which amounted to £251,354. The number of passengers carried for the year ended March 31, 1921, was 24,592,998, against 25,973,655 passengers for the same period in 1920. The report of Chairman Barr reviews the general improvement work undertaken by the company during this period. Contracts were let for fifteen new electric cars and ten new trailers were put on the road. A considerable amount of renewal work was undertaken and completed during the year, the most important being a renewal of main tracks in Cathedral Square.

The report makes mention of the amicable relations with the tramway union and states that the various matters during the year dealt with by the joint committee representing the union and the board produced satisfactory results.

Havana Property Reports

In his annual report on the operations of the Havana Electric Railway, Light & Power Company, Havana, Cuba, F. Steinhart, president and general manager, states that the railway department during 1921 enjoyed a considerable increase of business. The total number of passengers carried showed an increase of 19.8 per cent over 1920 and the passenger earnings increased from $4,850,969 in 1920 to $5,813,646 in 1921, or the same increase in percentage as the number of passengers increased. The total operating expenses increased from $3,454,057 in 1920 to $4,197,911 in 1921. On this point the general manager points out that as the year advanced coal and other commodities became available at lower prices and then labor costs began to go down, so that although the operating expenses for the year were more than 70 per cent of the total earnings, the highest proportion ever attained, the ratio in December had fallen to 61.39 per cent. The net earnings from railway operation showed an increase of $170,022 over 1920, the figure in that year being $1,625,677.

The average number of employees during the year was 4,343 and the management reported that the unrest among wage earners referred to in the 1920 report had disappeared and that throughout the year there was a complete absence of labor disputes.

Fifty-three new cars were delivered to the transportation department during 1921 and much construction work for other departments was supervised and directed.

Nearly $8,000,000 in Salaries and Wages Paid

In the annual report of the Connecticut Company, New Haven, Conn., published in the ELECTRIC RAILWAY JOURNAL, issue of May 13, it is noted that a total of $7,839,770 was paid in salaries and wages during the year to 4,436 employees. The report shows that there are sixteen general officers and 316 general office clerks. There are seventy-six maintenance of way superintendents and 523 employees in this department, while in the equipment department there are eleven superintendents and 254 employees. In the power department there is a superintendent and 230 employees, while the transportation division has 151 heads of divisions and other operating officers and 2,858 employees.

On the subject of stock and the company's liability the report states that the total par value of the authorized common stock is $40,000,000 with 400,000 shares outstanding, divided among the six stockholders who are the federal trustees appointed by the government and President Lucius S. Storrs. The terms of the trustees were to expire on March 4, 1922, or when their successors were elected.

The company has a contingent liability of $6,848,000, which is the amount outstanding of obligations of the "New Haven" road. These were secured by mortgage on street railway property, previous to the date on which these companies were acquired by the Consolidated Railway and the "New Haven" road and which later became part of the Connecticut Company.

Approval of Merger Sought

Application has been filed with Public Service Commission of Maryland by the Cumberland Edison Power Company to take over the Edison Electric Illuminating Company and the Cumberland Electric Railway. The new company was formed for the purpose of consolidating the railway and illuminating companies. At a meeting of the board of directors Thomas B. Finan was elected president of the new company. John E. Zimmerman, an engineer of national repute, will supervise the operation and development of the property.

Financial News Notes

Abandonment Approved.—The Board of Public Utility Commissioners has issued an order granting permission to the Public Service Railway to abandon service on Main Street, between Benner's Corner and Amboy Avenue, Metuchen, N. J.

Commission Approves Bond Issue.—The Tennessee Railroad Commission has given its permission to the Chattanooga Railway & Light Company to issue bonds to the amount of $682,000. This bond issue is understood to have been authorized in connection with the reorganization of the company referred to previously in these columns.

North American Reports.—For the twelve months ended April 30, 1922, the North American Company and its subsidiaries report a slight decrease in the gross earnings, but with economies in operating expenses producing an increase in net income from operations. The balance at the end of the period for depreciation, dividends and surplus amounted to $7,582,477, an increase of 31.8 per cent over the twelve months ended April 30, 1921.

Republic Property Reports. — The Republic Railway & Light Company and subsidiaries, New York, N. Y., for the twelve months ended April 30, 1922, report gross earnings of $7,198,026, against $8,405,954 for the same period a year ago. Operating expenses and taxes decreased $1,543,983. A balance remained for depreciation, dividends and surplus amounting to $515,447, against $343,239 for the twelve months ended April 30, 1921.

Decrease in Traffic Shown.—The Cincinnati (Ohio) Traction Company carried a total of 9,061,705 passengers during the month of April, according to a report tabulated by W. Jerome Kuertz, Director of Street Railways. In April, 1921, the traction company transported 9,004,163, which shows that the company carried on an average of 1,918 more passengers per day during last month. The total for April, however, is below that for March, when 9,098,342 passengers were conveyed.

Foreclosure Sale Announced.—Under decree of the Court of Common Pleas of Montgomery County, Pa., the Norristown Trust Company will sell at public auction on June 29, 1922, at the Court House at Norristown, all the property described in a certain mortgage executed by the Pottstown & Phoenixville Railway to the Norristown Trust Company, trustee, date June 1, 1912. The property consists of a line of railway from Stowe through the borough of Pottstown, and through Sanatoga Park to Linfield, and other rights and franchises. Included in the sale is the popular Sanatoga Park.

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Traffic and Transportation

Seeks Fare Extension

British Columbia Electric Railway Negotiates for Six-Cent Fare Continuation

Fares of the British Columbia Electric Railway, Vancouver, B. C., are again the subject of negotiation, following the rejection by the federal government of Canada of a petition to bring the company under the Railway Commission of the Dominion. The company is now negotiating with the city of Vancouver for an extension of its 6-cent fare permission after June 30 next and negotiations will be conducted with the surrounding municipalities and cities in which the company now operates.

The City Council of Vancouver on May 26 passed a resolution instructing the city attorney to prepare a by-law extending the present fares until either a permanent new franchise is agreed to or, failing that, the provincial government appoints a utility commission or other arbitration tribunal. A committee of four members of the City Council was appointed to draw up terms of a new franchise and report within two weeks.

An unusual term of the resolution was inserted at the instigation of a labor member of the Council calling for the company to maintain the present wage scale during the interim agreement. An attempt may be made to have this incorporated in the permanent franchise but it will not be agreed to by the company, it is said. The British Columbia Electric Railway has agreed in return for the proposed interim agreement to extend its Broadway West line a distance of one mile by Sept. 1. Power and light rates will be subject to negotiation as well as fares. A new franchise was proposed in 1921 but, on being drafted, met with disapproval in the city at large. This led to the company instituting a petition for a dominion charter as a means of obtaining stability. It has maintained that it cannot make extensions until permanency of revenue has been obtained.

Should no agreement be arrived at before June 30, when the present 6-cent fare privilege ends, the company has announced that it would not attempt to operate cars.

Answers Complaint of Skip-Stop and One-Man Car

Attorneys for the International Railway, Buffalo, N. Y., have filed with the Public Service Commission the railway's answer to the complaint of Corporation Counsel R. J. Moore in behalf of the City Council against one-man crew cars and the skip-stop system in operation in Niagara Falls, N. Y. The railway claims that the skip-stop system has provided for the greater convenience of the majority of the traveling public. The answer on the one-man car complaint says that better service is rendered, safer transportation is assured and less expensive operation is effected.

The railway asks that the complaint against this type of car be dismissed and that the commission not only approve of this operation on the two lines specified in the complaint, but also on such other lines in the city of Niagara Falls as the company shall consider advisable.

Galveston Decision Misconstrued —Seven-Cent Fare Necessary in Fort Worth

The Northern Texas Traction Company, Fort Worth, Tex., will not lower its fares in response to the demand made by the city authorities. A reply to this effect has just been sent to the city by George H. Clifford, vice-president and general manager, in reply to a communication from Mayor E. R. Cockrell. The Mayor in his note said:

> In my opinion the 7-cent fare in Fort Worth should be reduced in view of the recent decision of the United States Supreme Court in the Galveston case.

The city of Fort Worth had been delaying its fight for reduced fares pending a decision in the Galveston case and as soon as that case was decided was ready to take up the contest to force the desired reduction.

In reply to Mayor Cockrell, Mr. Clifford declared that the general opinion that the Supreme Court granted a 5-cent fare to Galveston is in error. He asserted that the decision merely set forth a method of ascertaining the proposed valuation, deducting expenses from revenues to arrive at set returns and does not specify a 5-cent rate. He expresses regret that the general opinion is that the Supreme Court set the 5-cent fare as equitable. Mr. Clifford said:

> The Supreme Court merely prescribed a method to be followed by a city to arrive at a proper rate, and the only bearing that decision has on the situation in Fort Worth is to ascertain whether that method has been used in Fort Worth.

The minimum property valuation of the Northern Texas Traction Company in Fort Worth, according to Mr. Clifford, is $7,753,857, while the net revenues during the last year amounted to $251,683, or interest on the investment at the rate of 3.25 per cent.

Mr. Clifford stated that in 1905 there were 24 miles of track in the city and that since that time 51 additional miles have been built, making a total of more than three times the mileage of 1905. Since 1910, he said, the company has spent more than $5,000,000 on improvements.

City Asks Rehearing in Fare Case

A petition has been filed with the United States Circuit Court of Appeals at Cincinnati, Ohio, by Clayton B. Blakey in behalf of the city of Louisville, Ky., asking for rehearing in the city's litigation with the Louisville Railway over 7-cent fares, seeking modification of the injunction granted by Judge Evans and upheld by the higher courts.

Several important points are brought out in the petition which Mr. Blakey said he felt should result in some modification of the injunction that now virtually prevents the city from obtaining any relief through legislation.

The petition for rehearing takes the view that "the vital question in this case concerns the validity of the 5-cent fare embodied in the franchise contracts entered into between the city and railway company since the adoption of the present constitution" in 1891. The United States Circuit Court of Appeals, in upholding Judge Evans, took the view that these franchises were of minor importance.

A second ground urged for rehearing and modification is the form of the temporary injunction. The city says that in view of the court's opinion it may become its desire to abandon its original contention and establish some other rate than 5 or 7 cents, but seems to be prohibited from doing so.

Jitneys Ruled Out

As a result of a recent Supreme Court decision jitney operators of Kansas City, Mo., found violating the restriction ordinance will be arrested, according to an announcement of Mayor Cromwell. The Supreme Court refused to discontinue the injunction issued by the Circuit Court of Kansas City.

A decision was given on April 14 by Judge Nelson E. Johnson of the Circuit Court declaring that the city jitney ordinance was valid, and that the Bestor law did not apply. The city ordinance provided that jitneys could not operate on streets where resident owners of 51 per cent of the property had not consented to their use for the purpose.

F. M. Roberts, head of the jitney men, in a statement said that if the people of Kansas City wanted motor transportation the Common Council and Mayor should be asked to modify the ordinances.

M. A. Fyke, assistant city counselor, who handled the jitney case for the city, said that the Supreme Court ruling would mean the jitneys were barred from all Kansas City streets unless the association can obtain the consent of owners of 51 per cent of the property frontage on the streets over which they operate.

Jitneys as Competitors Barred.—A permanent injunction against operation of jitney buses in those streets of North Little Rock, Ark., where they would compete directly with the cars of the Intercity Terminal Railway has been granted in Chancery court.

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Earnings Statement Presages Fare Cut

Cleveland car riders may be riding for a 5-cent fare before Sept. 1. That is the statement of the Cleveland (Ohio) Railway officials, as a result of the company's April showing. The company accumulated a surplus of $93,647 in its April operation. This has boosted the interest fund, fare barometer, to $324,158. When this fund reaches $700,000 the fare must automatically be reduced one notch in the rate schedule called for by the franchise. The rate is now 6 cents with a 1-cent charge for transfer. The next lower rate is 5 cents and a 1-cent charge for transfer. The April surplus is the largest earned in many months. Inasmuch as the recent 10 per cent wage reduction for motormen and conductors is effective from May 1, the company's report for May is expected to show even a larger surplus than that of April.

Business conditions have been improving so rapidly that company officials state that if they continue to improve during the summer months, there is little doubt but that, with the saving of $40,000 a month, the fare will be reduced before Sept. 1. A total of 33,498,152 riders was carried by the company in April. This is within 2 per cent of the number that rode in the same month the year previous.

Will Contest Termination of Jitney Agreement

Jitney operators in Spokane, Wash., have decided to contest the clause in the new railway franchise which terminates jitney operation on Jan. 1 of next year. The men base their claim on the ground that it was understood the jitney business was a permanent one when they invested in it. Opposed to this statement was Mayor Fleming, who contends that all jitney operators knew that the future of their business depended on the outcome of the railway situation. Corporation Counsel Geraghty said that he saw no chance for the jitneys to run in opposition to the ruling of the City Commission because twice the Supreme Court had upheld the right of the city to exclude jitneys.

Weekly Pass Plan to Be Continued

As a result of the successful operation of the weekly pass system on the lines of the New Brunswick Power Company, operating the electric railway in St. John, N. B., it is likely that this system will be continued indefinitely. It was started twenty-nine weeks ago.

When the passes were first issued, the holders were notified through advertising in the four daily newspapers of St. John that the system was on trial only and might last only a few weeks. The response to the first issue of passes was somewhat disappointing. During a recent week, however, 3,500 passes were sold.

The passes have stimulated traffic on the road, although the attempt to popularize the pass system through advertising has not been conspicuous or sustained. Just a few local readers were inserted in the newspapers at the start of the pass system, and no advertising has been done since.

The price for the passes is $1 dated from Monday morning to Sunday night. The regular rates are straight 10-cent fare, or three tickets for 25 cents or fourteen tickets for $1. Each week's pass is of different color and with the dates printed in semi-prominent type. The passes are numbered conspicuously covering the entire face, the numbers being taken from the number of weeks the system has been in operation.

The pass has aided the railway company materially in speeding up traffic on the road.

Urges Reduction in Fare

Delos F. Wilcox, valuation expert for the city of Minneapolis, Minn., expects to have his report ready for the Minnesota Railroad & Warehouse Commission in July. In reporting on May 20 to the chairman of the street railway committees of the City Council, Dr. Wilcox intimated that instead of an increase of fare for the Minneapolis Street Railway the question is how much the fare may be reduced. It is now 6 cents and a determination of a proper rate of fare is to be put up to the State Commission under the 1921 Brooks-Coleman law, which places that question in the jurisdiction of the commission. He said that so far as Minneapolis is concerned its larger earnings have been covered, so as not to show a disparity with the earnings of the St. Paul City Railway.

Mr. Wilcox is quoted in part as follows:

> The company's case was stronger last August than it ever will be again. At that time it was anxious to prove the value of its property by the appraisals previously made on behalf of the city. Since then prices have been coming down and its operating expenses have decreased. It has been forced to abandon the fifty-fifty rule of division on the intercity lines.
>
> I estimate that a proper adjustment of its accounts for 1921 would show an income derived from operations within the city of Minneapolis sufficient to pay 6 per cent on $29,000,000, or nearly 12 per cent on $15,000,000. I estimate that with the reduction of expense in effect since the first of the year, the company's true operating income for 1922 in Minneapolis at the present rate of fare will be sufficient to pay 6 per cent on $40,000,000, or 16 per cent on $15,000,000.

Mr. Wilcox is of the opinion that if the Minneapolis Street Railway could be freed of its twin city intercorporate relations its credit, based on its own earning power, would be as high as that of any electric railway in the country. Further, that under the present rate of fare the company without difficulty could finance its improvements out of earnings, as it has done in the last five or six years, despite the fact of its relations with the other companies which are at present included in the twin city system.

Transportation News Notes

Traffic Survey for New Orleans.—Paul H. Maloney, Commissioner of Public Works in New Orleans, has just arranged with John A. Beeler of New York to make a comprehensive traffic survey of the electric railway lines in New Orleans.

Increased Service in Effect.—The Interborough Rapid Transit Company, New York, N. Y., following out the order of the Transit Commission increased its service on May 31 by the addition of 263 trains. The details of the commission's ruling were given in the ELECTRIC RAILWAY JOURNAL, issue of May 6, 1922.

Agree on Single Fare.—The New York Transit Commission recently announced through its chairman that an agreement had been reached between the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company under which there will be dual operation with a single fare in Queens. From Queensborough Plaza in Long Island City to Corona free transfers will be issued.

One-Man Cars and Tokens in Use.—One-man cars and the token system for cash payments had their beginning in Erie, Pa., recently by the Buffalo & Lake Erie Traction Company. Seventeen one-man cars were operated with success, according to General Manager Meyers, who believes that this type of car will be instrumental in speeding up service. The tokens used have a value of 8 cents.

Approves of Jitney Ordinance.—The Circuit Court of Appeals has held valid the city ordinance regulating jitney buses in Green Bay, Wis. The ordinance rules jitneys off the streets used by traction lines and establishes a license fee of $100 a year, which the court has held reasonable. The court also pointed out the obligation of the city to protect the traction company against the unfair competition of jitneys.

New Schedules and Fares Announced.—The Northwestern Ohio Railway & Power Company, operating between Toledo and Bay Point, Marblehead, expected to issue new ticket books, on June 1, which would mean a 20 per cent reduction to the users of the tickets. They will be transferable and good for one year. The books will be put up in lots of 200 5-cent fares and will sell for $8. F. K. Woodring also reports that his company will run Sunday excursions from Port Clinton to Detroit for $2.50 during the summer. The week-end excursions to Buffalo will be continued this summer, connecting with the Lake Shore Electric at Sandusky and the Buffalo boat at Cleveland, starting June 11.

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Personal Mention

These Men Run Municipal Railway

Brief Biographies Presented of Principal Department Heads of the Municipal Railway at Detroit Who Report to General Manager Goodwin —Organization Changes Noted Previously

INSTANCES are by no means rare in electric railway work of exceedingly young men being advanced to posts of great responsibility. In the select circle of such men there have been in the past, among others, Edwin C. Faber, who at twenty-six was general superintendent of the Cleveland Railway; Oren Root, Jr., who at twenty-nine was general manager of the old Metropolitan Street Railway, and Daniel L. Fennell, now superintendent of transportation of the Kansas City Railways, to mention just a few.

MR. RIDER IN CHARGE OF TRANSPORTATION

Now comes E. S. Rider to join the railway hall of fame. He has just been made superintendent of transportation of the lines in Detroit operated by the city. Mr. Rider was born only twenty-five years ago, on Feb. 9, 1897, in Norwalk, Conn. His first railway work was with the Connecticut Company as a clerk in the cashier's office in Norwalk. In December, 1914, he was made cashier in Norwalk, and in July, 1915, his duties as cashier were extended to include the Stamford division as well. During this employment he assisted in the operating department in making various reports and in December, 1917, was transferred to the accounting department in the office of I. A. May, general auditor, in New Haven. He continued in this position until July 11, 1917, when he was made traveling auditor to cover the various local properties comprised in the Connecticut Company's system.

From July, 1917, until August, 1919, Mr. Rider served in the United States Navy, and then returned to the Connecticut Company under Mr. May, continuing in the auditing work until November, 1919. From then until October, 1920, he acted as chief clerk of the Bridgeport division. After Joseph S. Goodwin had become established as the manager of the Municipal System in Detroit, Mr. Rider was taken on by him as timekeeper in connection with the extensive construction work then in progress. After this was completed he was transferred to the accounting department, then to the maintenance of way department.

A CONSPICUOUS SUCCESS

When the first twenty-five cars were placed in operation on the municipal railway in Detroit, Mr. Goodwin had no superintendent of transportation to take charge, and as he was extremely busy with other things and could not give the matter his personal attention, he turned the direct work over to Mr. Rider and intended himself to follow it rather closely. Mr. Rider, according to Mr. Goodwin, made such a conspicuous success of this work as the property grew from twenty-five cars to 300 cars, and then to 428 cars, that he seemed to be the logical man to trust with the responsibility of acting as superintendent of transportation for the present system comprising 1,457 cars. Mr. Rider now has under his jurisduction a system comprising seven divisions and 3,500 trainmen, and he is probably the youngest superintendent of transportation in the industry.

A. C. Colby, superintendent of equipment, Department of Street Railways, Detroit, has been connected in a similar capacity with the Municipal system almost from the first. In his early work he was responsible for all of the details in connection with the specification and purchase of 250 safety cars and 50 Peter Witt type double-truck cars, which comprised the municipal system up to the time that the first purchase of 30 miles of the Detroit United Railway system was made. He now has entire responsibility for all of the mechanical equipment of the Detroit system.

MR. COLBY HAS HAD WIDE EXPERIENCE

Mr. Colby was born in Vermont, in 1878, and started his railway experience as a conductor of the Rhode Island Company in 1900. In 1905 he started work in the mechanical department doing pit work and general repairing at one of the carhouses, and gradually worked up through the mechanical department to more important positions. In 1909 he went to South Bend, Ind., as general foreman in the shops of the Chicago, South Bend & Northern Indiana Railway under F. M. Weld, master mechanic, who is now master mechanic for Mr. Colby in Detroit. He remained there one year and then went to Birmingham, Ala., where he was engaged entirely on the rebuilding of the rolling stock of the Birmingham Railway, Light & Power Company.

When the Birmingham, Ensley & Bessemer Railway was opened, Mr. Colby became the first master mechanic. A year later he accepted a position with the Berkshire Street Railway, Pittsfield, Mass., one of the subsidiaries of the Connecticut Company, and continued in this position for four years. In 1917 he was transferred to Bridgeport as master mechanic of the Bridgeport division, and then on Feb. 1, 1920, was transferred to New Haven, Conn., as mechanical engineer in charge of the maintenance of equipment on the New Haven division. In September, 1920, he left the Connecticut Company to become superintendent of equipment of the Municipal system in Detroit.

H. M. Gould, electrical engineer of the Department of Street Railways, Detroit, Mich., became connected with the Municipal Railway in August, 1920, as electrical engineer. He was formerly superintendent of overhead lines for the Connecticut Company, New Haven, Conn. Mr. Gould was graduated in 1907 from the Sheffield Scientific School, electrical engineering course. He spent the two years following his graduation in the electrical department of the Long Island Railroad. The next year he spent as a student engineer with the Metropolitan Street Railway, New York City. He then engaged for some time in miscellaneous electrical work and in January, 1912, entered the city engineer's department in Bridgeport, Conn. He left this position later that year to go with the Connecticut Company.

W. D. Edgecomb, engineer of maintenance of way of the Department of Street Railways, city of Detroit, was the first man employed by the Street Railway Commission after the election at which the municipal street railway bond issue carried. His work began on April 7, 1920, five days after the election. At the age of seventeen Mr. Edgecomb felt a desire to become an engineer and from that time he has been connected with general engineering field work, supplementing his work with hard study. He was born in St. Paul, Minn., and moved with his parents to Michigan when he was seven years old. About fifteen years of his experience was gained with the Grand Trunk and the Grand Trunk Pacific railways on heavy mountain constructions and on maintenance of way as assistant engineer. He was office engineer for a short time for the railway in Montreal, but always preferred field work.

As assistant engineer in charge of maintenance of way with headquarters in Detroit, he was in charge of and thoroughly familiar with all station surveys and grade work in his division. His first work for the city of Detroit was as instrument man in 1891. Later he returned to the railroad work, with which he was connected until 1914 with the exception of the year 1912, when he was in California for his health. From 1914 to the time he took up work with the municipal street railway he was assistant engineer in the city engineering department in charge of field work connected with Detroit's sewer program and also on grade separation work of the city.

The complete line-up of the officials of the Department of Street Railways, Detroit, of which J. S. Goodwin is general manager, was published in the ELECTRIC RAILWAY JOURNAL for May 20, page 839

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Fifty Years Spent in Street Railroading

All New England Pays Tribute at Manchester, N. H., to Remarkable Record of E. C. Foster—Gala Occasion for Members of Railway Club —Employees Also Participate in Celebration

"Golden opinions from all sorts of people."

SUCH were expressed on May 25 to E. C. Foster, president of the Manchester Traction, Light & Power Company. The occasion was the regular monthly meeting of the New England Street Railway Club, called at Manchester, N. H., primarily to observe the fiftieth anniversary of Mr. Foster in the street railway industry. It was a gala occasion for the club, but not a whit less so for the employees of the company of which Mr. Foster is the head. No matter how deeply he had endeared himself to his fellow railway men of New England, Mr. Foster was after all the chief of the men and women of the local system and they staged a little celebration of their own. From them and the officers connected with the company there were presented to Mr. Foster a smoking set, flowers and an engraved cigarette case. From the members of the club Mr. Foster received an eight-day chime clock.

Mr. Foster Devoted to His Duties

Henry C. Attwill, chairman of the Public Utilities Commission of Massachusetts, in the speech which he made at the meeting of the railway men, attributed Mr. Foster's accomplishments in life to his disinterested and unselfish devotion to duty in every task he was called upon to perform. He inspired confidence in public authorities, in the general public, in those whose money was intrusted to his care and in the employees with whom he dealt. It was Mr. Attwill's thought that Mr. Foster could have no better reward than he was receiving at the hands of the assembled railway men and in the knowledge that the people at large appreciated his many good qualities.

Mr. Attwill's was, perhaps, the principal encomium to the man who had just completed fifty years of service in the industry. Among others who paid tribute to Mr. Foster were Patrick F. Sullivan, Henry C. Page and Edward A. Dana. Mr. Sullivan has known Mr. Foster intimately longer than any other railway man. He disliked to praise a man to his face, but had felt no misgivings in doing so in the case of Mr. Foster. Mr. Dana expressed particularly the appreciation of the younger men in the railway field, many of whom Mr. Foster had encouraged and assisted by his helpful advice.

Mr. Foster's Career Outlined

Of such was the bulk of the praise made up. Few there are who remain in the industry today that have the background to draw upon possessed by Mr. Foster. At seventy he is carrying responsibility that many younger men would be loath to assume. The railway business makes peculiar demands upon a man, but Mr. Foster has never shirked any of them. Just fifty years ago to the day of the meeting of the club Mr. Foster entered street railway work with the Lynn & Boston Railroad. This was May 25, 1872. Mr. Foster gradually worked up through the several departments until April 1, 1883, when he was appointed acting superintendent. In November of the same year he was made superintendent, and in 1892 general manager. The Lynn & Boston was later taken over by the Massachusetts Electric Companies and Mr. Foster became

E. C. Foster

vice-president and general manager of that company. Mr. Foster next went to New Orleans. This was in May, 1903. He was at first president of the New Orleans Railways, but when the New Orleans Railway & Light Company was organized Mr. Foster was made president of the company and continued with that company until 1909. He then became associated with Sanderson & Porter in valuation work, and in December, 1911, was made president of the company at Manchester. Mr. Foster was born at Hancock, N. H., on Oct. 23, 1852.

There is the bare outline. It is a record such as one expects to find in "Who's Who" and the kind that one is not disappointed in finding there. It answers its purpose as a recital of dates but of events it tells precious little. From it, for instance, who would ever guess that Mr. Foster has a record of never having had any serious troubles with labor on the roads he has managed. In short, the life of the man has simply been replete with facts and incidents worth relating. Those that have occurred in recent years have had to do mostly with details of operation. To them does not of course attach the romance that went with pioneering of the early days. In these Mr. Foster had a very big part and they are today among the most charming of his recollections.

For instance, there is the recollection of the thrill that went with the letting of the contract for the electrification of the Lynn & Boston Railroad. That could be experienced but once. On July 4, 1888, the first section of road was opened at Crescent Beach, Mass., with a few cars. In those days the men on the horse car lines being converted to electricity were wont to believe anything the new tribe of electrical engineers told them. They soon got over this, however. Thus, Mr. Foster has related how he willingly paid $7 for a trolley wheel which later was made in quantities to sell for less than a dollar. Such was the extent of the faith of the early managers in the superior knowledge of the new school. It was a big event, this electrification, for the Crescent Beach division of the Lynn & Boston Railroad was the first electric railway built by the Thomas-Houston Electric Company, as well as the first passenger trolley line in Massachusetts.

This is just one of the happenings taken from the busy life of Mr. Foster. It serves, however, to tie him in with a myriad of other events that those in the industry in the early days will readily recall. Never again will the opportunity be afforded in the electric railway business for a repetition of just such incidents as the one recited. It was William Knox who in verse propounded the question:

"O! why should the spirit of mortal be proud?"

To this seemingly unanswerable question Mr. Foster and others like him have returned the answer in the record of their achievements. For in the long run these men have done many times more for others than they have ever done for themselves.

J. W. Shartel a Commerce Director

John W. Shartel, vice-president and general manager of the Oklahoma Railway, Oklahoma City, was elected a director of the Chamber of Commerce of the United States at the meeting held by that organization in Washington, D. C., last week. Mr. Shartel will represent the fifth district of the country in the board of directors. Mr. Shartel attended a meeting in Washington, D. C., late in May, where he made an address at the first session of the Chamber's section on Transportation and Communication. His subject was the labor situation. Mr. Shartel is an enthusiast on electric traction, and has many plans for the extension and improvement of the electric railway system centering in Oklahoma City. He is a strong advocate of the high speed entrances for interurban cars into the centers of cities without grade crossings at either highway or railway. His election to the board of directors of the Chamber of Commerce is gratifying to the electric railway industry.

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D. U. R. Personnel Reorganized

Rearrangement of Departments and Officials Followed the Sale of the Traction Lines in Detroit to the City—600 Miles of Line Are Still Under Operation by the Company

BEFORE formally turning over the property of the Detroit United Railway in Detroit to the municipality E. J. Burdick, vice-president and general manager, issued a bulletin announcing the force that would remain with the company to operate the interurban lines and the city properties in Port Huron, Flint, Pontiac, Mt. Clemens and Ann Arbor. In prefacing this list of names Mr. Burdick said:

> The reorganization of existing forces occasioned by the change is indicated in the following list of personnel of the various departments. The one regret of the management is that it cannot take over all of the present organization and it takes this occasion to express its sincere appreciation of the splendid efforts of each and every employee in the past and of its willingness and desire to assist them to employment with the city lines or elsewhere.

Only about 200 men and women were left unemployed by either the company or the city.

The general office force, as appointed by Mr. Burdick, consists of twenty-three people. Chief among these are the following:

Auditor.....R. G. Skeman
Acting cashier.....Roy Hoover
Assistant purchaser.....F. L. Wheaton
Supervisor of schedules.....J. H. Brooke
General timekeeper .....W. M. Spaulding
General superintendent .....Harry Bullen
Assistant general superintendent.....
.....P. L. Radcliffe
Publicity manager ....A. D. B. Van Zandt
Real estate commissioner.....Thos. Beath
Inspection service.....F. A. Galloway

The resignations of J. F. Keys, general passenger agent, and of G. W. Wagner, purchasing agent, have been accepted to take place in a short time. No successors will be appointed, the duties of Mr. Keys falling under the traffic department and those of Mr. Wagner will have the direct supervision of General Manager Burdick, with the details cared for by the assistant purchaser.

A similar number constitutes the traffic department, chief among whom are:

General traffic manager.....W. S. Rodger
General freight and express agent....
.....Nathan Rumney
Traveling freight agent..R. W. Thompson
Auditor freight accounts.....J. B. Hooper

Because all accident cases accrued up to the time of the transfer of the city lines remain to be disposed of by the D. U. R. a large proportion of the old claims organization has been continued. This numbers thirty in all, chief of whom are:

General claims attorney..W. G. Fitzpatrick
Assistant to claims attorney..B. J. LeBoeuf
Chief trial division.....G. M. O'Connor
Chief investigator .....L. E. Schimmel

Numerically the majority of the force attached to the accounting passenger receipts department was transferred to the city payroll. The remaining force consists of thirty-seven under charge of:

Auditor passenger receipts....J. W. Slater
Assistant auditor .....Bert Thompson

Mr. Slater was assistant in this department and was promoted with the resignation of W. B. Brooks, brother of F. W. Brooks, formerly president of the company. Mr. Thompson was attached to the cashier's department before the reorganization.

Inasmuch as the company's properties now consist largely of high-speed lines it was thought advisable by Mr. Burdick to organize an engineering department more in line with the practice of steam road operation. With this in mind the track department of the old organization has been worked into the engineering department, with enlarged powers covering the engineering problems of other departments as well. The department will have charge of all engineering work except the operation of the power houses and substations. Thus its use will be made available for all departments including the operating department. In the engineering department are:

Chief engineer .....J. M. Mudie
General roadmaster .....L. N. Hayden
Engineer .....C. A. Handy
Engineer .....H. B. Woodward
Engineer .....H. Carter
Bridge engineer .....F. A. Shaft

The creation of the engineering department gives a marked promotion to Mr. Mudie. Mr. Handy, now attached to this department, was, in the old organization, consulting engineer in charge of appraisal work. John Kerwin, formerly superintendent of tracks, retires from active railway life.

The electrical department has also undergone some radical changes and is now divided. W. J. Vaughn has been made superintendent of distribution and as such is in charge of overhead and underground work, the signal system and also the telephones. Powerhouses and substations come under the direction of the power department, with H. F. Rech as assistant superintendent of power, acting directly under the general manager.

Another department that has been very considerably altered is the mechanical department with a superintendent of shops in charge. In this department are:

Superintendent of shops.....Hugh Savage
Accountant .....R. S. Wilson
Chief storekeeper.....David Thibault

As storekeeper Mr. Thibault will have direct charge of the stores of all departments including those of the general offices. Sylvester Potter, formerly head of the shops as master mechanic, remains with the company doing special work under the direction of the general manager.

The powers of the superintendents of the several interurban lines have been enlarged. These officials now have supervision of all buildings and their employees, as well as the operating force, with the exception of powerhouses and substations and the employees thereof. Motormen and conductors will be hired directly by the superintendents, the position of superintendent of employment being abolished.

A. E. Peters as secretary and Joseph Bampton as assistant treasurer continue with the company and are direct appointees of the board of directors.

As a part of the change the several departments of the Detroit United have been consolidated under one roof at Highland Park. There the company retained fifteen acres of the extensive and valuable Highland Park shop properties, one unit of which is being converted to the use of the company for its general offices.

Obituary

Arthur B. Stitzer

Arthur B. Stitzer, vice-president and chief engineer of the Republic Engineers, Inc., died from hemorrhage of the stomach on May 26 while on a business trip. He was taken ill on a train of the Pennsylvania Railroad and was removed to the Altoona Hospital, but passed away within a few hours. Mr. Stitzer was born July 20, 1877, and his early life was spent in Philadelphia. He was graduated from the University of Pennsylvania in 1899 and ten years later received the degree of electrical engineer from that university. After leaving college he became connected with the Union Traction Company of Philadelphia and later with its successor, the Philadelphia Rapid Transit Company, with which he remained until April 25, 1910. He then resigned to become electrical engineer for Ford, Bacon & Davis, with whom he remained until April 30, 1917, when he was appointed chief engineer of the Republic Engineers, Inc., of New York. On Feb. 10, 1919, he was elected a director of that company.

Mr. Stitzer has always taken an active part in the work of the American Electric Railway Engineering Association and the National Electric Light Association, and for the former was chairman of the power generation committee in 1921 and third vice-president of the Engineering Association in 1922. He was a member of the A.S.M.E., A.I.E.E., Franklin Institute and Railroad Club of New York. He was also prominent in Masonic circles. He lived in Orange, N. J., and leaves a widow and one son.

Orlando B. Ayers, right-of-way agent of the Puget Sound Power & Light Company, Seattle, Wash., died recently in Seattle. Mr. Ayres served the company as superintendent of collection and later as adjuster in the claim department. For some time he was associated in private business, and in 1921 returned to the company as right-of-way agent for the construction of the proposed intermountain power lines.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Car Manufacturer Speaks on Prices

W. H. Heulings, Jr., of the J. G. Brill Company, Emphasizes that Downward Trend Has Stopped—Change Attributed to Upward Turn in Steel Prices and Activity in Steam Car Building

One of the best informed men on the subject of cars and car prices in this country is W. H. Heulings, Jr., vice-president and general manager of the J. G. Brill Company, Philadelphia. Mr. Heulings was asked this week by a representative of the ELECTRIC RAILWAY JOURNAL to express his views for the Manufacturers and Markets Department on the subject of car prices and whether any changes might be expected in the early future. He consented to do so and his statement not only points out the conditions which tend to produce higher prices but declares that his company in June will be obliged to withdraw every quotation it has made on standard cars and figure the base price at about $6,000 or more for the single truck car and about $10,000 or more for the double-truck car. Mr. Heulings' statement follows:

"In October, 1920, the combined cost of labor and material entering into the construction of the Birney safety car reached its peak. Then commenced a decline in the steel market which started a corresponding decline in the price of safety cars. Gradually but continuously the selling price of the Birney safety car dropped from $6,800 a year or so ago, until it struck its present level of $5,800. It was the desire of the manufacturers to bring the price of rolling stock down to the point which would prove of sufficient interest to railway companies to encourage purchasing. Therefore, with every successive drop in the cost of material and labor, the very life was practically cut out of the price of the car, the manufacturers welcoming every opportunity to lower prices to the advantage of the purchasing companies. But now the raw material markets have stopped in their rush downward, and consequently the price of safety cars cannot be expected to go lower.

"As long as the price of steel and other materials entering into the construction of safety cars continued to drop so did the price, but the steel market has now stiffened and has every tendency to go higher. Steel bars quoted at 2.35 in January, 1921, dropped gradually until the low point of 1.40 was reached in February, 1922, and in March went higher to 1.50. Steel plates at 2.65 in January, 1921, also dropped to 1.40 in February, 1922, and increased to 1.50 in April. This upward turn in the steel market will also have the tendency to increase the selling price of safety cars just the same as the declining steel market had the tendency to lower prices. So much of the safety car and its equipment is constructed or evolved from pig iron or steel, the stiffening of the markets for these materials must be expected to have an important influence on safety car prices. Also there has been an increase within the past few months in the cost of yellow pine flooring, and in the case of many other materials entering into the construction of safety cars the long decline which was experienced has also been arrested.

"Then there is the increased activity in steam car construction. Purchases deferred for years are now being made and, consequently, there is a demand for skilled labor, such as is essential to the car-building trade, the like of which has not existed for quite some time. While electric railway car buying has picked up somewhat since Jan. 1, there is much room for improvement, and those who have been waiting for prices to reach their lowest level can now confidently enter the market with the feeling that by so doing they are buying to their own advantage. There is no mistaking the signs of the times. Prices are not going to go lower as long as the steel and other material markets continue their present direction. Quite a few far-seeing railway executives have recognized this fact within the past few months and have placed orders for much needed equipment.

"You will find some of our railway friends who will be inclined to believe the present condition of the steel and labor markets only temporary. They may decide to hold off longer in placing their orders for safety or other type cars. I have given you my views on the situation, and I think you will find that I am not far wrong when I say that the present market conditions will make it necessary for us in June to withdraw every quotation we have made on standard cars and figure the base price at about $6,000 or more for the single-truck car and about $10,000 or more for the double-truck car."

Advertising Conference in Milwaukee

THE first annual industrial advertising conference will be held in Milwaukee June 11 to 15 in connection with the eighteenth annual conference of the Associated Advertising Clubs of the World. Industrial advertising is defined as that which concerns the marketing of goods to industry as contrasted with the marketing of goods from industry to the individual consumer.

There will be one session on the afternoon of June 12 and two sessions on June 13. The speakers include J. C.

ELECTRIC RAILWAY MATERIAL PRICES—MAY 30, 1922

Metals—New York

Copper, electrolytic, cents per lb	13.875
Lead, cents per lb	5.70
Nickel, cents per lb	36.00
Zinc, cents per lb	5.725
Tin, Straits, cents per lb	31.75
Aluminum, 98 to 99 per cent, cents per lb	19.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	35.00
Commercial	15.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$6.125
Somerset mine run, Boston	3.375
Pittsburgh mine run, Pittsburgh	....
Franklin, Ill., screenings, Chicago	....
Central, Ill., screenings, Chicago	
Kansas Screenings, Kansas City	2.725

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$40.00
Standard open hearth rails, gross ton	$40.00
Railroad spikes, drive, Pittsburgh base, cents per lb	2.25
Tie plates (flat type), cents per lb	1.85
Angle bars, cents per lb	2.40
Rail bolts and nuts, Pittsburgh base, cents, lb.	3.625
Steel bars, cents per lb	2.10
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	1.35

Hardware—Pittsburgh

Wire nails, cents per lb	2.65
Sheet iron, (24 gage), cents per lb	3.05
Sheet iron, galvanized, (24 gage), cents per lb	3.70
Galvanized barbed wire, cents per lb	4.10
Galvanized wire, ordinary, cents per lb	3.00

Waste—New York

Waste, wool, cents per lb	13.00
Waste, cotton, (100 lb. bale), cents per lb.:	
White	10.00
Colored	9.00

Paints, Putty and Glass—New York

Linseed oil, (5 bbl. lots), cents per gal	92.50
White lead, (100 lb. keg), cents per lb	12.25
Turpentine, (bbl. lots), cents per gal	92.50
Car window glass, (single strength), first three brackets, A quality, discount*	85.5%
Car window glass, (single strength), first three brackets, B quality, discount*	86.2%
Car window glass, (double strength, all sizes, A quality), discount*	86.0%
Putty, 5 lb. tins, cents per lb	5.50

*These prices are f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb	15.50
Rubber-covered wire, cents per lb	5.75
Weatherproof wire base, cents per lb	15.50

Paving Materials

Paving stone, granite, 4 x 8 x 4, f.o.b. Chicago, dressed, per sq.yd	$3.20
Common, per sq.yd	3.00
Wood block paving 3½, 16 treatment, N. Y., per sq.yd	2.17
Paving brick, 3½ x 8½ x 4, N. Y. per 1,000 in carload lots	49.50
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.75
Cement, Chicago consumers net prices, without bags	1.97
Gravel, ¾-in., cu.yd., N. Y	1.75
Sand, cu.yd., N. Y	1.00

Old Metals—New York

Heavy copper, cents per lb	10.00
Light copper, cents per lb	9.312
Heavy brass, cents per lb	5.75
Zinc, old scrap, cents per lb	2.937
Yellow brass, cents per lb (heavy)	6.50
Lead, heavy, cents per lb	4.725
Steel car axles, Chicago, net ton	$15.75
Old car wheels, Chicago, gross ton	18.75
Rails (short), Chicago, gross ton	16.25
Rails (relaying), Chicago, gross ton	16.00
Machine turnings, Chicago, gross ton	6.50

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McQuiston, Westinghouse Electric & Manufacturing Company; F. M. Feiker, McGraw-Hill Company; Max W. Babb, Allis-Chalmers Manufacturing Company; W. Lee, Frank D. Chase, Inc., and Edwin F. Gay, of the New York *Evening Post*. There will be an exhibit in connection with the conference.

$84,400 for Betterments

A bill recently introduced in the City Council of Seattle, Wash., and referred to the city utilities and finance committees provides for an appropriation of $84,400 for betterments to the Seattle Municipal Railway system, including $17,000 for the reconstruction of thirty cars. In addition to the appropriation for reconstruction of cars, the bill provides for $1,900 for adjustment of tracks at Thirty-fifth Avenue west and Government Way, occasioned by paving in the Fort Lawton district.

Structural Sales Near Capacity

Orders for fabricated structural steel placed during April were almost equal to the capacity of fabricating firms, according to reports made to the Department of Commerce by firms comprising two-thirds of the fabricating capacity of the United States. Sales reported during April amounted to 115,247 tons by seventy-five firms having a capacity of 116,918 tons, or at the rate of 99 per cent of capacity.

At this rate, the total sales throughout the United States, based on a total capacity of 180,000 tons, were 177,600 tons in April. This compares with 139,300 tons reported for March by the Bridge Builders' and Structural Society, based on reports of sixty-four firms showing sales at 77 per cent of capacity.

Rolling Stock

Jackson (Miss.) Public Service Company has purchased six new cars with modern equipment.

York Railways Company, York, Pa., is making a study of lightweight interurban cars with a view to possible purchase.

Quebec Railway, Light, Heat & Power Company, Quebec, Canada, will start in right away under the new management overhauling and repainting its rolling stock.

Youngstown & Suburban Railway, Youngstown, Ohio, has purchased two lightweight one-man interurban cars from the Kuhlman Car Company. These are equipped with four 25-hp. motors and 26-in. wheels. The body will have an arch roof and will be constructed largely of plymetal as a trial of this material.

Dallas (Tex.) Railway needs at least twenty-five double-truck cars in addition to those now in service to care for the passengers hauled on its lines, according to J. W. Monk, inspector of car service under the Supervisor of Public Utilities. Mr. Monk is now engaged in a careful check of all lines in the city in order that he may check up and recommend definitely how many new cars should be purchased. The inspector is of the opinion, however, that fifty new cars are needed to displace old and obsolete cars now in service and that at least twenty-five additional cars should be placed in service.

Track and Roadway

Northern Indiana Railway, South Bend, Ind., has announced that its city lines will be extended this year by laying of several miles of track.

Toronto Transportation Commission, Toronto, Canada, will start work shortly on the construction of a double-track line from Sunnyside to the Humber.

Georgia Railway & Power Company, Atlanta, Ga., expects to buy 600 tons of 122-lb. A.E.R.A. girder rail with track accessories.

Georgia Railway & Power Company, Atlanta, Ga., has purchased 120 miles of No. 0000 seven-strand bare copper cable and 210 miles of No. 00 seven-strand bare copper cable for transmission lines.

Trenton & Mercer County Traction Company, Trenton, N. J., has completed the work of the grand union at State and Broad Streets, Trenton. The cost of this union to the company is $25,000. It will be of great convenience and a saver of time in the switching of cars.

New York, N. Y.—The Transit Commission has awarded the contract for the construction of the elevated extensions of the Fourteenth Street-Eastern District line from Meserole Street, Brooklyn, to East New York to the Joslin Construction Company.

Quebec Railway, Light & Power Company, Quebec, Canada, has announced through its president that a number of extensions of the system to points in the vicinity of Quebec will be completed in the course of the next few years.

Shops and Buildings

Los Angeles (Cal.) Railway has started work on the third automatic substation in a program for increased power facilities throughout the system. The station is located near Melrose Avenue and Kingsley Drive and will serve the northwest section of the city. A 1,000-kw. General Electric converter will be installed in an artistic building of Spanish architecture. The complete cost is estimated at slightly over $100,000. The Los Angeles Railway has two automatic substations already in operation. One is located in the company's Vernon store yards and serves the southeast district. The second is in the Garvanza region at Avenue 56 and York Boulevard, the north end of the city.

Trade Notes

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the removal of its Salt Lake City office to 313 Doodly Building.

Track Specialties Company, New York, N. Y., has announced the appointment of Walter R. Pflasterer as agent for the Chicago territory. He will be located at 527 Manhattan Building, Chicago.

Laconia Car Company, Laconia, N. H., has had a steady manufacturing program on hand during the current year. In recent weeks as many as sixty cars have been turned out and the unfilled orders amount to $1,500,000. In the first three months of 1922, net earnings were reported amounting to $50,000. It is believed that the second quarter of the year will show an improvement over this figure.

Westinghouse Electric & Manufacturing Company reports contracts for power apparatus during the past week as aggregating more than $1,000,000. The companies from which the contracts were received are the Public Service Production Company, a subsidiary of the Public Service Company of New Jersey; the United Gas Improvement Contracting Company of Philadelphia, and the Luzerne County Gas & Electric Company of Pennsylvania.

New Advertising Literature

Uehling Instrument Company, Paterson, N. J. has issued Bulletin No. 113 on gas filters for CO_2 recorders.

Drew Electric & Manufacturing Company, Cleveland, Ohio, has just issued a leaflet describing its floating bell hanger used in connection with line construction.

Aeroil Burner Company, Inc., Union Hill, N. J., has just issued a new bulletin, No. 20, describing oil-burning appliances for paving, road building and various shop work.

Allis-Chambers Manufacturing Company, Milwaukee, Wis., has just issued a new bulletin, No. 1109, covering distribution transformers having ratings of 200 kva. and smaller, suitable for lighting and power purposes, and of the oil-immersed, self-cooled, outdoor type.

The Indianapolis Switch & Frog Company, Springfield, Ohio, has recently published a thirty-two page booklet dealing specifically with Indianapolis Apex and Simplex Welded Joints and electric welding in general as applied to track maintenance and construction.

Indiana Steel & Wire Company, Muncie, Ind., has issued a sixty-four page cloth-bound booklet on double galvanized steel strand and iron wire for electrical transmission and distribution lines. The booklet contains a technical report covering tests on wire.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Canadian Railway Men and Manufacturers Pull Together

THE Canadians held a rousing three-day convention at Quebec during the first week in June. The extreme easterly location of the city perhaps worked against a really large attendance, although the associate (supply) members gave practically 100 per cent support to the first exhibit held in connection with the Canadian Association conventions. While they incurred an expense which was possibly larger than was warranted by the actual attendance of railway men, nevertheless the feeling was general that the effort made this year will bring results next year and thereafter. If next year's meeting is held at Toronto, as was suggested, the central nature of the location will help toward making exhibits a regular feature.

The Canadian Association is in a peculiar position, due to the large number of municipal railways in its territory, which, in contrast with the rules of the American Association, are eligible to membership. This is a factor in connection with the attendance at meetings. Particularly in the smaller cities, the City Council looks askance at proposed expenditures of this kind by the municipal street railway manager. A successful exhibit like that just held ought to be an effective sales argument in such cases. And if the Councilmen could see how seriously the discussions are participated in and how distinctions among railway company officials, city representatives, commissioners and manufacturers are obliterated at the meetings, with consequent benefit to all concerned, they would promptly O.K. all reasonable requests for convention expense authorizations.

Action Needed on Highway Taxation Problem

AT PRACTICALLY every convention of electric railway men in the last year the subject of taxation of buses and trucks which use the highways as common carriers has been discussed at length. Nearly every one, not only railway men who have a peculiar interest in the matter, but men from nearly all walks of life, agree that it is unfair to the general taxpayers to permit this destructive use of the roads without adequate compensation therefor. The automotive interests themselves have long realized that it is only a matter of time until they will have to assume a share in the cost of road maintenance and possibly construction. But being quite human, they naturally have not been going about advocating greater taxation and urging public bodies to hasten to add a substantial burden to their operating costs.

Perhaps it takes a lot of discussion and a long time to crystallize public sentiment sufficiently to enable the passage of legislation. However, it would seem to be about time for the railway men to transform discussion of the problem into definite steps to bring it before the state legislatures and then work to secure passage of just bills. Because of their double interest, first as large taxpayers and, second, to avoid helping to pay the maintenance-of-way costs for their competitors, the railways particularly are justified in taking the initiative in bringing this important matter to a head. As broad as this problem is, to date only two states—Illinois and Maryland—have attempted by legislation to correct the obviously unfair situation.

How Much Tax and How Shall It Be Applied

HOW to apply the tax and how much the charge should be are problems the solution of which will require very careful study and the accumulation of data not now available. In general, however, railway men should bear in mind that they have reason to think well before attempting to create too great a penalty for the highway users. They may later want to go into the bus or truck transportation business themselves; in fact, they are quite likely to do so. Some have advocated that steps be taken to get the railways relieved of some of their burdens rather than to spend energy in getting the other fellow loaded down with taxes and restrictions. This is certainly a commendable thought, but there is no use wasting time and effort on a proposition that is foredoomed to failure.

There is little possibility of directly freeing any one from any levy now. The tendency and study is to find new sources of revenue. But any portion of the cost of maintenance and construction of roads that is put definitely on the users relieves the railways proportionately and places their competitors on a more fairly comparable basis of operating expense. Both railways and highway transportation companies must continue to be taxed on their physical property value. In addition, the buses and trucks should be taxed a sum that will fairly represent the cost of the road depreciation which they cause. Whether this shall be distributed on a ton-mile and seat-mile basis, on a gasoline tax basis, or how, is open to debate and further study. In Maryland trucks of common carriers are charged $\frac{1}{3}$ cent per ton-mile for gross weights up to 6,000 lb., $\frac{2}{3}$ cent from 6,000 to 12,000 lb. and $\frac{3}{3}$ cent for weights over 12,000 lb. Buses are taxed $\frac{1}{20}$ cent per seat-mile for vehicles of less than 3,000 lb. net weight, $\frac{1}{15}$ cent for weights from 3,000 to 7,000 lb. in interurban operation or up to 8,500 lb. if equipped with pneumatic tires, or up to 8,500 lb. for solid tires when the haul is entirely within an incorporated community. Over these limits of 7,000 and 8,500 lb. the rate is $\frac{1}{8}$ cent per seat-mile. In Illinois buses must pay $\frac{1}{20}$ cent per seat-mile and trucks $\frac{1}{2}$ cent per vehicle-mile without regard to weight.

The most extended official consideration of this subject which has been made is undoubtedly that represented by the report of the Davenport committee appointed by the New York State Legislature to study the

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question of taxation in that State. This committee had previously made a report on electric railway taxation in New York, and it had found that the railway companies were greatly overtaxed as compared with other lines of business, particularly other utilities. Its study of the existing practice of motor vehicle taxation resulted in the opposite conclusion, and in its report dated March 17 it recommended an increased State tax, based on the weight of car and type of tires, with double rates for public passenger vehicles and a tax of 1 cent per gallon on gasoline sold in the State.

Railways' Better Financial Condition Is Understood by Bankers

FURTHER testimony of the improved financial conditions of the electric railways is given in an interim report of the committee on public service securities of the Investment Bankers' Association of America. This report not only declares that the appreciation in the market values generally of both senior and junior securities of utility companies is marked, but it calls particular attention to what it calls "the fundamental soundness of the electric railway business," which "is as essential as light and power services and in the interests of the public welfare must be assured as sound a financial basis as they."

This is refreshing reading and reflects a state of mind quite different from that which existed only two years or so ago when it was not an uncommon thing for investment bankers, when advertising the securities of utility companies, to point out that the utility derived little or none of its income from railway property. The ELECTRIC RAILWAY JOURNAL at the time referred to this practice editorially as unfortunate, and it is censured also in the Investment Bankers' interim report. Fortunately, at the present time, the practice is decreasing, if it has not entirely disappeared.

One of the most interesting statements in the interim report is that suggesting the desirability and possibility now of financing extensions to utility enterprises by the sale of junior securities, especially to customers of the operating companies, together with the suggestion that the investment bankers themselves might well devote more attention to the development of markets for these securities. Up to this time most of these security sales to customers have been made directly by the utility. Now that this means of financing has been quite well established and is known to have some very pertinent advantages to the utility, it is quite natural that the bankers should be giving it consideration to avoid the loss of good sources of salable issues. There are undoubtedly some advantages, however, in employing an investment banker as an intermediary, and these advantages probably outweigh the disadvantages, provided the utility retains a general supervision of the plan of campaign.

The principal gain in turning this matter over to an investment house is of course the fact that the sale of securities, like any other kind of work, can usually be done more effectively and economically by experts than by those who must conduct the work as a side issue. Any campaign of this kind in one city is very similar to that in another, and experience in several communities ought to show the best way of undertaking the work, as well as what to avoid. This is the experience the investment banker has to offer, in addition to experienced salesmen backed by the reputation of the house.

Radio May Have Place in Railway Field

MOST electric railway engineers, like every one else, are thinking of radio primarily as a means of light entertainment. That it may come to have a really significant value in the railway business, however, is an imminent possibility. In theory there are a number of applications that are entirely feasible. It remains for experiment and development to prove them practical. If radio can be successfully applied in the electric railway field, it will bring a very important improvement in the degree of continuity of service.

The ordinary wire telephone, useful as it is under normal conditions, often goes out of commission altogether during a heavy electrical or sleet or wind storm, just when it may be needed the most to direct operations during emergency conditions. Interruptions to power supply are also not infrequently accompanied by a consequent disruption of telephone service. At such times as these radio transmitting and receiving sets installed at power houses and switching centers might provide the means of communication that would prevent long delays to service. Load dispatching seems quite within the realm of radio communication as a supplement to the telephone system, both technically and financially, because the number of sets needed is comparatively small. Some progress has already been made in this direction, particularly by those power companies that have remote sources of energy, delaying prompt patrol of lines.

Dispatching trains by radio, supplementing the telephone, may be a possibility, at least to the extent of affording communication between fixed stations and the dispatcher. Placing receiving sets on the cars direct brings in difficult transmission problems and entails a high investment, but it is not an impossible thing. It is even within the realm of possibilities that a radio signal system may be devised doing away with the necessity for overhead signal wires. Or it may be found possible to operate by radio a signal indication in the motorman's cab whereby a dispatcher could retain constant communication with each train. In thinking of these seemingly fantastic possibilities it should be noted that once a radio relay is operated, it becomes possible to accomplish almost any local electrical operation. Such a relay has been designed and used successfully in experiments.

One of the simplest and most readily available uses of radio for the electric railway is for the purpose of keeping in touch with line construction and maintenance crews while out on the system. For example, instead of having an emergency line crew sitting idle for hours at a stretch in order that it may be reached promptly at the end of a telephone line, the line car or truck could be equipped with a radio receiving set and the crew thereby kept within call while out doing maintenance work.

A small amount of experimental work has already been done along some of these lines—enough to justify the belief that there is more than an entertainment interest in radio for electric railway engineers. But practically the whole development work is yet to be done. One of the restrictions upon a full development of the railway application is the involved patent situation which makes it difficult or impossible to get suitable apparatus. Other limitations are the requirements as to license for transmitting stations, the small range of wave lengths reserved for the use of utility companies and the interference from other radio sets and from static. Nevertheless the subject would seem to merit earnest study.

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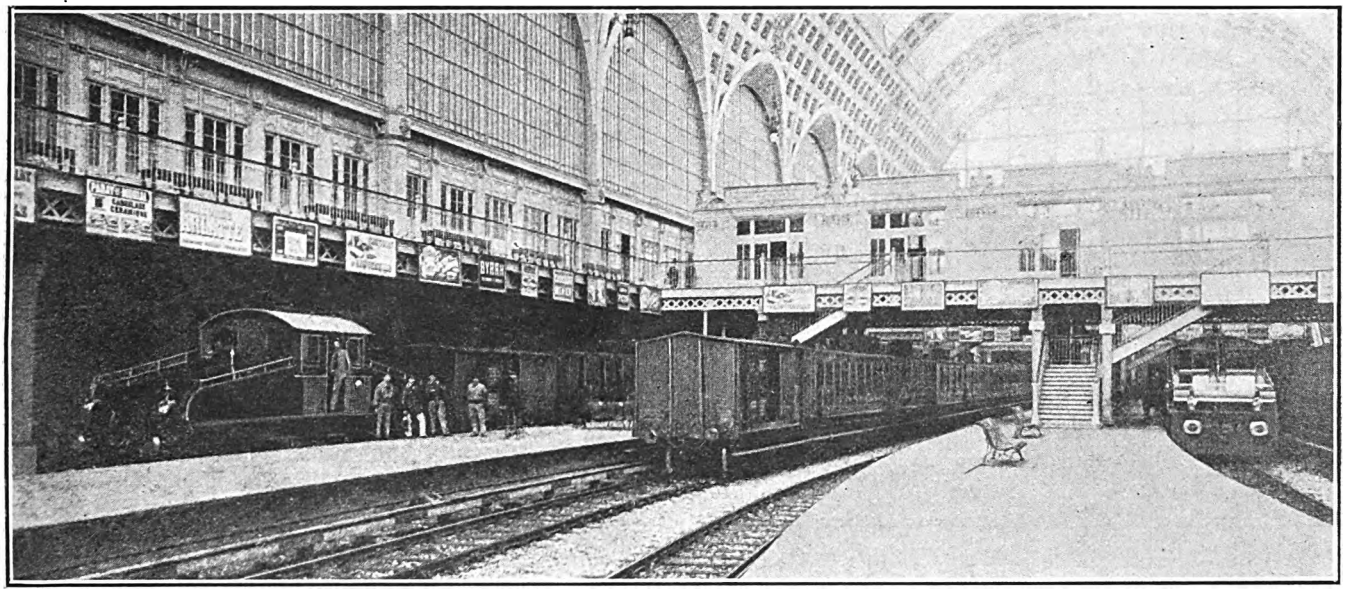
France Making Real Progress in Electrification

Paris-Orleans Railway, a Pioneer in Electrification, Will Electrify at Once a Complete Steam-Engine Division with Direct Current at 1,500 Volts—Other French Railroads Will Follow Suit —Total Mileage Involved in Twenty-Year Program Is 5,000

BY PAUL CHARPENTIER AND EARL M. BILL
Engineer Compagnie Française Thomson-Houston and
Railway Engineering Department General Electric Company Respectively



AN ELECTRIC TRAIN PULLING OUT OF QUAI D'ORSAY STATION IN PARIS

IN VIEW of the present-day trend toward the electrification of the railroads in the United States a short survey of the progress of the electrification of French railroads should prove of interest to the American railroad man. This is particularly true in the light of the recent announcement that $8,000,000 in contracts for the electrification of the Paris-Orleans Railway have been let to a group of French manufacturers headed by the Compagnie Française Thomson-Houston, representative of the International General Electric Company, and that American concerns will participate in supplying some of the equipment. This announcement was published in the ELECTRIC RAILWAY JOURNAL for May 27.

Before reaching its conclusions in regard to electrification the French government caused exhaustive investigations to be made of all important electric traction systems throughout the world; collected all possible available data; determined the probable savings in operation that could be expected; made a decision as to system to be used, and laid out a definite program for railway electrification on a national scale.

During the war years and those preceding it became obvious that steps must be taken to reduce the consumption of coal, much of which was imported. As the war progressed plans had to be made for the rehabilitation of railway equipment to care for the expected resumption of heavy traffic which had fallen off during the war.

To study ways and means to accomplish these things, there was appointed a committee of more than thirty engineers representing all departments of the several French railway systems as well as the various technical departments of the French government, including the telegraph and telephone departments.

This committee conducted extensive investigations in France, Italy, Switzerland, England, Sweden, Germany and the United States with a view to determining (1) what benefits could be obtained by the electrification of French railways, (2) what system of electric traction should be used and (3) means for standardizing the selected system for all French railways.

FINDINGS OF COMMISSION

As a result of the investigations of this committee, it was recommended that:

1. Direct current, at 1,500 volts, be standard for all French railways.
2. A defined program of sections and lines be laid out for electrification.
3. Water power in the Pyrenees mountains be utilized by the Midi, in the Alps by the Paris-Lyons-Mediterranean and in the central mountain district by the Paris-Orleans Railways.
4. The railway power transmission lines be consolidated with those for industrial power and lighting.
5. A frequency of 50 cycles be used for all future alternating-current installations and that certain voltages be used as standards for the high-tension power transmission.

A glance at the layout of a French railway system, of which Paris-Orleans, as shown in the accompanying map, is typical, will show that it consists of a network of main and branch lines. The average distance between junction points is about 15½ miles, and it was considered that 1,500 volts d.c. would allow the installation of substations about every 15½ miles, or at each junction.

Serious consideration was given 2,400 volts d.c., but as it was thought that the lower voltage was more

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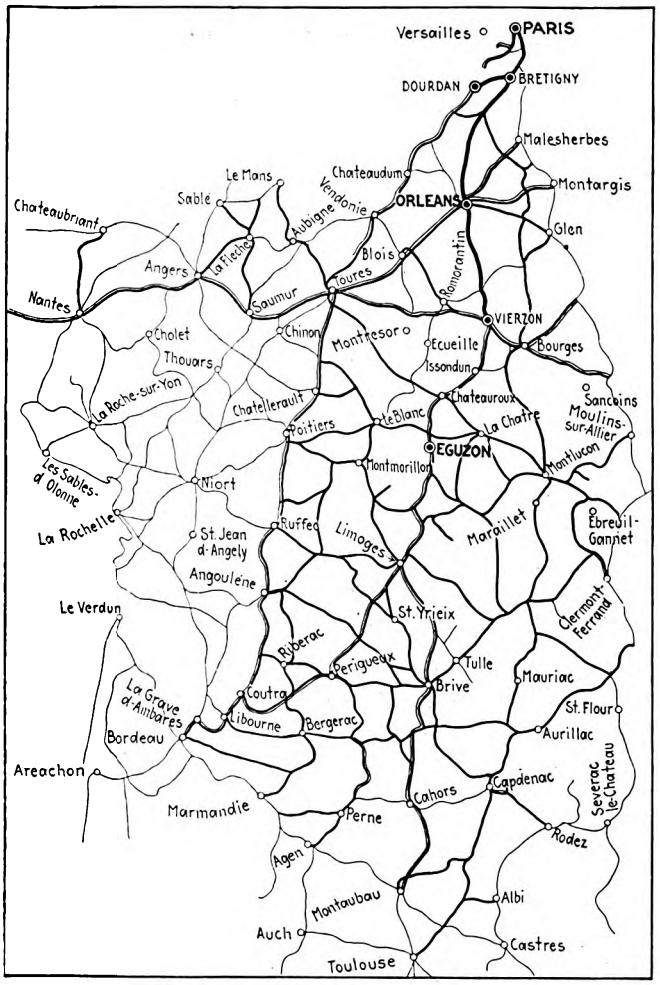


MAP OF PARIS-ORLEANS RAILWAY SYSTEM, SHOWING NETWORK CHARACTER AND DIVISION NOW TO BE ELECTRIFIED

easily applied to motor cars and would also allow the use of a third rail, it was adopted.

The use of water power will occasion a great saving in coal, as the committee anticipated that 1,160,000,000 kw.-hr. per year would be used on the nearly 5,500 route-miles of the P.-O., the P.-L.-M. and the Midi Railroads, all obtained from water power, and that in twenty years the consumption would be about 2,260,000,000 kw.-hr. per year. On the basis of about 2 lb. of coal being required per kilowatt-hour in a modern steam station, the expected savings in coal would vary from, say, 1,160,000 to 2,260,000 short tons per year.

The selection of 50 cycles as the standard for the production of alternating current involves the giving up of the generation of 16⅔ and 25 cycles for either single or three-phase traction. Obviously the consolidation of railway power transmission lines with those for industrial and lighting service means fewer and better transmission lines.

ELECTRIFICATION BEGAN IN 1898

In 1898 the Paris-Orleans started the electrification of its underground terminal between Paris-Quai d'Orsay and Paris-Austerlitz stations, a distance of about 2.6 miles. This included a 600-volt, direct-current, third-rail distribution and eight 49.5-ton locomotives. Three-phase synchronous converters with transformers converted the 25-cycle, 5,500-volt, three-phase power transmitted from the Ivry steam station through underground cables.

In 1905 this electrification was extended from Paris-Austerlitz to Juvisy, a distance of about 12 miles. Three more locomotives and about ten motor cars were purchased. Two more substations were installed to take care of the extension.

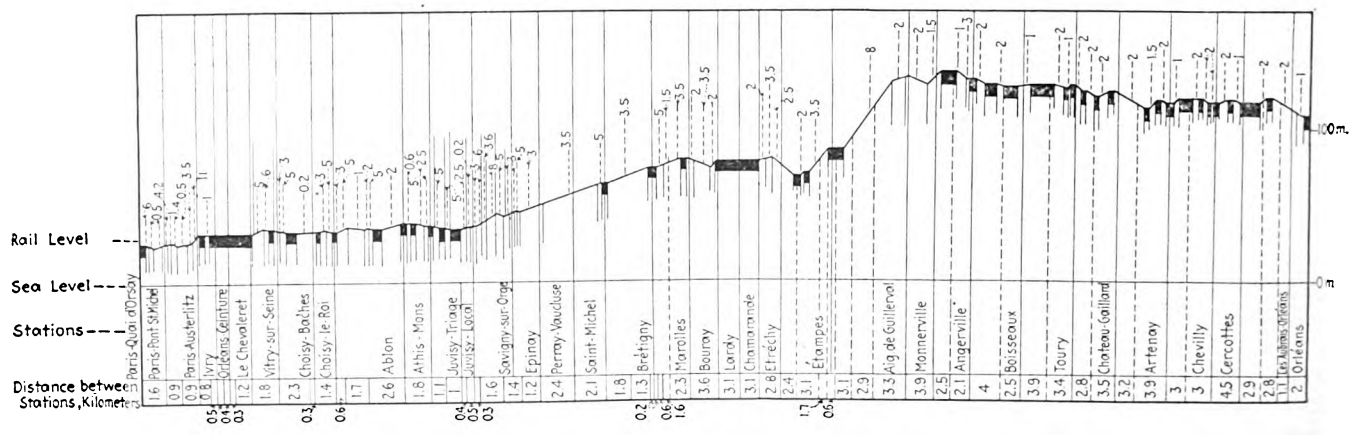
Orders had been placed in 1914 for locomotives to bring the total to sixteen when the outbreak of the war interrupted these improvements.

The Paris-Orleans, since the war, took up the interrupted work and, acting in conformity with the committee's recommendations, began the electrification of a total of about 143 route-miles, which include a revamping of the existing electrification Paris-Quai d'Orsay to Juvisy, an extension of the main line to Vierzon (one steam engine division) and a branch line from Bretigny to Dourdan. (See map.) About 25 miles of the route is four-track and the balance is two-track.

Power, it has been decided, will be supplied from a water-power station of about 40,000-kw. capacity on the Creuse River at Eguzon, about 70 miles from Vierzon, the southern end of the electrification. This power will be transmitted at 150,000 volts, over long distances, and 90,000 volts has been selected for the substation supply. Lighting and industrial load will be supplied along the line of the railway. Synchronous converters operating two in series on 1,500 volts direct current will be used for the transformation to direct current in each of eleven substations.

About 200 locomotives will be required, some for the present extension and the balance for a future extension south of Vierzon. The Paris-Orleans engineers are now studying the question of high-speed passenger locomotives and will make trials on several designs, among which will be a bi-polar gearless machine.

Some of the passenger locomotives will be required to handle certain trains known as "rapide," trains at speeds as high as 75 to 80 m.p.h.



PROFILE OF PART OF PARIS-ORLEANS RAILWAY INVOLVED IN FORTHCOMING ELECTRIFICATION

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About eighty motor cars will be used on suburban and local trains. Some trailers will be used, the number of trailers in each train varying according to the service.

To Cover One Complete Engine Division

As previously mentioned, the extent of the contemplated extension of the Paris-Orleans Railway's present electrification will cover one steam-engine division for through trains and one suburban division. Thus the full advantage of electrification can be obtained in regard to the release of steam locomotives from the electrified division to other divisions, an advantage not secured when only portions of steam-engine divisions are electrified.

In addition to this, conclusive comparisons of operating results between steam and electric operation over the same division under European conditions can be expected, as it is anticipated that the traffic with electric traction will return to the pre-war density with steam power. The high pre-war train density on the Paris-Orleans Railway existing before the war on practically all lines serving Paris and its suburbs was occasioned by the large demand for transportation and the use of small cars for both passenger and freight traffic.

The grades from Paris to Vierzon are very easy, as is shown in the profile, the country being more or less rolling.

It is anticipated that in the future, the electrification will be extended from Vierzon to Limoges, the second present steam-engine division from Paris. Later some east and west lines of difficult profile such as Montlucon-Gannat, Brive-Clermont and Lomoges-Tulle will be added to the electrified system.

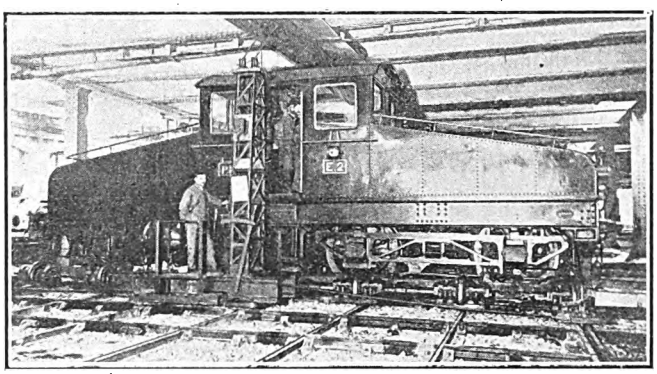
It will be seen from the foregoing analysis of the P.-O. that to date 14.3 miles of suburban lines have been electrified, operating eleven locomotives supplied with power by three substations. This system, originally built for 600 volts, direct current, third rail, is now being changed over to 1,500 volts. Contemplated and now under construction are 143 route-miles, including the present change-overs and taking in one complete engine division (Paris-Vierzon) as well as a branch line from Bretigny to Dourdan.

Coincident with the growth of electrification of the Paris-Orleans Railway, the Etat (then known as the Ouest) Railway was also developing plans for electrification. In 1900 a line was opened from Paris-Invalides to Versailles for suburban traffic. In 1913 the Etat planned a general electrification of all suburban lines with a total of 143 route-miles in addition to that already in service from the Invalides Station to Versailles, but the outbreak of the war halted the completion of the order. Since the war the Etat has placed orders for thirty locomotive equipments of 66 tons each. These locomotives, conforming to the national electrification plans, will operate on 1,500 volts and also on a reduced voltage of 600 to 750.

Midi and P.-L.-M. Railway Plans

In 1910 in the southern part of France the Midi Railway likewise began plans for the electrification of a substantial portion of its lines. Single phase at 12,000 volts, 16⅔ cycles, was selected and an experimental line of 29 route-miles between Perpignan and Vernet-les-Baines was installed. Shortly afterward the Midi equipped three short mountain branches on the Pau-Tarbes line with single-phase trolley. These three lines total about 43 miles. Since completion of the studies of the French commission, the Midi Railway has proceeded to change over to 1,500-volt direct current in conformity to the commission's recommendations. For the present the 1,500-volt electrifications will cover lines formerly operated at 16⅔ cycles single phase. Electrification is also being extended to other lines and orders have been placed for the electrification of nearly 155 route-miles.

Another great French railway, the Paris-Lyons-Mediterranean, began electrification from 1905 to 1910, electrifying a 24-mile line in a mountainous region between Le Fayet and Chamonix, at 800 volts, direct current. This was later extended an additional 19 miles. Before the war the P.-L.-M. was considering the electrification of three more lines of difficult profile. The most important of these is the Culoz-Modane line, preliminary studies of which have been begun. This



Electric Locomotive of Paris-Orleans Railway on Motor-Operated Transfer Table in Quai d'Orsay Station

line connects with the Italian State Railways from Turin and has grades as high as 3 per cent. Power will be purchased from private water-power companies at 42,000 volts, 50 cycles, and transmitted to the substations at 75,000 or 90,000 volts.

In the future the electrification of the main line from Lyons to Marseilles via Valence and Avignon will be considered.

Over 5,000 Miles to Be Electrified

From the foregoing it will be seen that the outstanding feature of all the proposed railway electrifications is that the question of system has already been decided and that valuable time will not have to be spent by each individual railway in fighting out the "battle of the systems." The French railways are thus in a fortunate position regarding the electrification of their lines. Only one frequency will be used for power transmission and the result should be a high state of apparatus standardization, since high-tension voltages have been standardized.

Among the three roads, P.-O., P.-L.-M. and Midi, it is expected that approximately 5,000 miles of route, mostly double-track, will be electrified within the next twenty years and later 500 route-miles or more will be added.

Since time does not have to be given to the question of system, and since the question of saving coal is so vital, we find French railways well advanced on a definite program that bids fair to place France as one of the leading countries in the world in amount of length of track electrified.

Do not the French railways furnish an excellent example for American railroads? At least they furnish food for much thought.

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Saving Energy on the Long Island

This Railroad, Which Early Adopted Electric Operation for Part of Its System, Has Now Nearly 200 Miles So Operated—A Ten-Year Effort to Save Power Has Brought Satisfactory and Permanent Results

BY L. S. WELLS
Electrical Superintendent Long Island Railroad, New York City

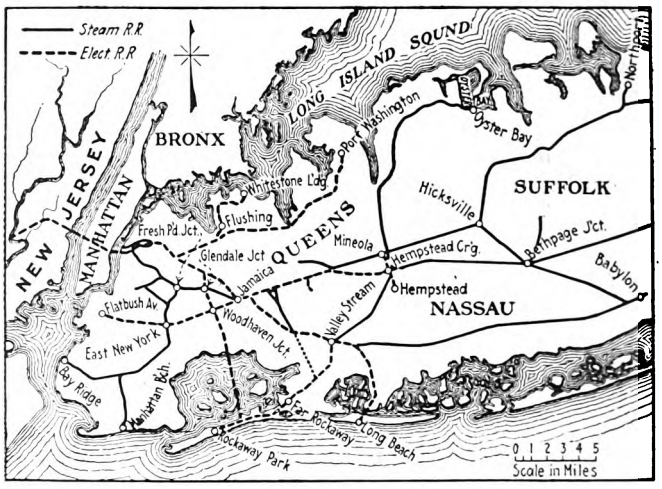
THE Long Island Railroad commenced the operation of multiple-unit trains on the lines extending from Flatbush Avenue to Jamaica and Belmont Park and from Flatbush Avenue to Rockaway Park, Far Rockaway and Valley Stream in 1905. In 1908 the electrification was extended to Hempstead and in 1910, with the opening of the Pennsylvania Terminal in New York City, the line between Long Island City and Jamaica was electrified and further extension made from Valley Stream to Long Beach. In 1912 and 1913 the Whitestone Landing and Port Washington branches were electrified. Since 1913 no extensive additions have been made to the electrified sections. The extent of the present electrification is shown on the accompanying map.

ELECTRIFICATION PERMITTED BETTER TRAIN MAKEUP

Power for the operation of the system has from the start been supplied from the Pennsylvania Railroad Company's power house, located on the East River at Long Island City. It is generated at 11,000 volts, three-phase, 25 cycles, and transmitted at the same voltage to substations, where it is converted to 650-volt direct current and fed directly to the third-rail sections.

It was early recognized that the change in form of motive power from steam to electricity in suburban service brought with it possibilities of changes in operating practices and methods which might result in marked economies in power consumption. For example, with steam-locomotive-hauled trains the unit of operation, not only from a traffic but also from a power standpoint, is the train-mile. To add or subtract cars from a train once made up called for a considerable amount of switching, with the result that at times of light traffic many empty or lightly loaded cars were hauled over the road. With the change to multiple-unit operation, with electricity as the motive power, the unit, from a power standpoint, became the car-mile, not the train-mile. The keeping of accurate records of the power consumption permitted the cost of power used in operating a car one mile to be determined, and the cost of operating empty cars could thus be brought forcibly to the attention of the operating staff. Cars could be added to or taken from trains with greater facility. As a result train lengths were varied to meet the traffic demands, better loading was secured and much dead mileage was eliminated.

With accurate records of power consumption, the effect of additional stops on the power consumption and thus on the cost could also be clearly brought out. The timetables and runs were studied with a view to eliminating unnecessary stops, and to making local stops where possible with trains of few instead of many cars. The transportation officials were led step by step to consider the effect of stops in making up



LONG ISLAND RAILROAD LINES IN WESTERN PART OF ISLAND

schedules and to scrutinize every request for an additional stop.

The electric cars are all heated by electricity taken from the power circuit. The great variation in power consumption between the summer and winter months soon brought out the large amount of power used for heating and the cost of providing this power. The steam trains were likely to be overheated, particularly in mild weather. As exhaust steam from the locomotive was available in almost unlimited quantities, the steam was turned on at the first signs of cold weather. Little, if any, attention was paid to its effect on the fuel consumption of the locomotive. With electrically heated cars, where the total power consumption was carefully watched, it was found that in cold weather, when all the heater switches were turned on, more than one-third of the total power consumption was being used for heating. This naturally led to closer supervision of heating. The car heaters are divided into three circuits, each controlled by a switch. Heater boards indicating the number of points of heat to be used are displayed at all terminals and a rigid inspection is made to see that the heater switches are being properly used and that no heat is being wasted. In addition, thermostats to control automatically the amount of heat used have been installed on many of the cars and their performance is being closely followed. The heating campaign has even spread to the steam trains and an effort is now being made to secure a better regulation of the heat in steam service.

ELIMINATING MINOR WASTEFUL PRACTICES

Another source of power waste was discovered in cars laid up in terminal yards. Air for brakes, operation of the multiple-unit control, etc., is supplied by motor-driven compressors. It was found that the switches controlling these compressors were frequently left in when cars were laid up. With the constant

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leakage in the air lines, compressors on such cars would run much of the time. Heaters were also frequently left on in cars laid up for the night. A system was inaugurated of having all switches cut out when cars are laid up, and having them cut in sufficiently in advance of the leaving time to heat the cars properly.

The suburban traffic of the Long Island has two marked peaks, one between 7 and 9 a.m. and one between 5 and 7 p.m. During these four hours of the day about 40 per cent of the total daily energy requirement is used. To improve the load factor and reduce the maximum demand on the power system efforts are constantly being made to take all possible load off the peak hours. Train movements are studied with a view of eliminating all unnecessary movements and of postponing wherever possible until after the peak hours light movements between the yards and the terminals, etc.

Scientific Coasting Was Adopted Early

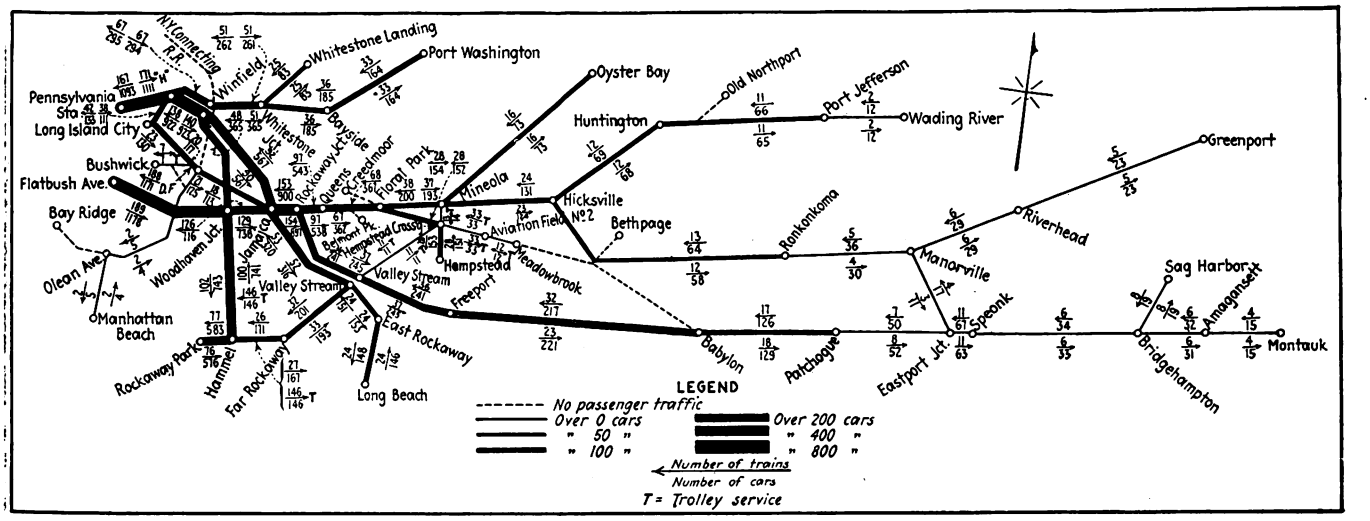
Following the power consumption closely as they did, it was natural that the Long Island officials should take great interest in the amount of coasting which could be done on a given run and to take means for increasing this coasting. In 1911, soon after the coasting clock or coasting-time recorder was placed on the market, a trial installation of ten clocks was made by the Long Island Railroad, five on the smaller or subway type cars, known as M.P.41 class, and five in the larger cars, known as M.P.54 class. At that time motormen were carefully instructed in the handling of their trains so as to secure the maximum amount of coasting. Shortly after the installation of the clocks, troubles of a minor nature developed which led to inaccuracies in the readings and nearly a year was devoted to changes and improvements in the clock mechanism. It was, therefore, not until the latter part of 1913 that accurate coasting-time records were secured. From that time on records have been kept of the coasting performance.

At the present time sufficient cars are equipped with coasting clocks to provide a car so equipped on each of a large percentage of the trains run. The clocks are punched and the paper with the coasting record removed by a member of the train crew and turned in by him with his time sheet. The slips are collected by the timekeeper and sent to the office of the electrical superintendent, where the record of each motorman is compiled. The motorman also turns in a small slip with his time sheet on which he indicates whether or not there is a coasting clock on his train, thus checking the performance of the trainmen in turning in slips. The records are kept on a large sheet by train and run numbers and summarized twice a month, the first summary being for the first two weeks in the month and the last summary for the entire month. This record shows the run number, name of motorman, running minutes, coasting minutes and coasting percentages. It is sent to the road foreman of engines. The assistant road foreman of engines, who is in direct charge of motormen in electric service, follows this record very carefully and whenever a motorman seems to be falling behind in his coasting, he rides with this man and endeavors to help him better his performance. Most of the men seem to take a keen interest in their coasting percentages and follow closely the records which they make from month to month.

Coasting Records are Used to Stimulate Pride in Good Performance

There are so many different kinds of runs and makeup of trains that no attempt has ever been made to offer any monetary reward or inducement for the best coasting record. Reliance has been placed on the posting of results and close following up of men with poor records to stimulate interest and get a better performance. Early in the campaign for increased coasting, certain coasting percentages were established for a great many different types of runs and an endeavor is made to bring the men up to this standard of coasting. The standards have been changed from time to time as conditions have changed. For example, as the increased use of trail cars in the makeup of multiple-unit trains decreases the rate of acceleration and thus the possible coasting percentage with a given schedule time, due allowance must be made for this fact.

From time to time special coasting campaigns, lasting for a week or two, have been carried on. During these campaigns special efforts have been made to get the maximum amount of coasting. The road foreman of engines and his assistants have ridden continuously over the road watching the performance of each individual motorman and making suggestions for improvement. The train crews have been instructed to



Traffic Chart for Typical Summer Day of 1921, Showing Numbers of Trains and of Cars on Different Parts of the Electrified and Connecting Lines

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act promptly in opening and closing car doors, loading and unloading passengers on trains, etc., so as to reduce the length of station stops to a minimum. Attention has also been called to the proper method of approaching signals when in the "Caution" or "Danger" position, allowing the trains to coast slowly up to the signal rather than making a sudden stop and then notching up. In addition, towermen at interlocking and junction points have been instructed to route trains so as to reduce to a minimum the number of crossover movements; also to have routes set up and signals cleared prior to the approach of a train, thus allowing trains to move with the greatest freedom at such points.

In addition to the very substantial saving in power the increased coasting has reduced the duty on the motors and other car equipment. The M.P.54 type of car was originally designed for operation in trains of all motor cars. It was found, however, after several years of such operation that there was a considerable margin in the capacity of the motors, so that trailer cars could be added without overloading the motor equipment. The result is that longer trains are now made up with about 30 per cent trail cars. It is true that the close attention paid to coasting has been a material factor in permitting the use of these trail cars.

TABLE I—TRAFFIC AND POWER CONSUMPTION 1910-1921—LONG ISLAND RAILROAD

Year	Car-Miles	Ton-Miles	Average Weight of Car in Tons	Energy Consumption at Power House Energy Consumption at Power House for Traction Kilowatt-Hrs.	Energy Consumption at Power House Kilowatt-Hrs. per Car-Mile	Energy Consumption at Power House Watt-Hours per Ton-Mile
1910	6,934,244	280,324,080	40.9	31,750,000	4.588	113.4
1911	8,792,956	383,003,150	43.6	40,637,000	4.625	106.1
1912	9,836,211	438,404,725	44.6	47,040,000	4.791	107.4
1913	11,056,786	504,224,813	45.6	54,510,000	4.928	108.1
1914	12,600,339	592,723,272	47.0	64,510,000	5.116	108.9
1915	12,616,869	624,215,806	49.5	66,380,000	5.261	106.3
1916	13,541,108	679,259,104	50.2	72,220,000	5.320	106.4
1917	14,062,184	706,075,016	50.2	78,200,000	5.567	110.8
1918	14,209,184	723,355,454	50.9	78,710,000	5.545	108.8
1919	16,330,216	814,664,500	49.9	84,080,000	5.170	103.3
1920	18,456,744	906,698,948	49.7	94,050,000	5.100	103.7
1921	19,919,765	965,130,836	48.5	94,959,000	4.770	98.2

STATEMENTS COVERING TRAFFIC AND POWER CONSUMPTION

The results of the effort to control the power consumption on the Long Island Railroad are shown in the accompanying tables. Table I shows for the years 1910 to 1921, inclusive, the relation between the car movements in car-miles and ton-miles and the power consumption. In the fall of 1910 service was inaugurated into the Pennsylvania Station and the electric mileage about doubled. Previous to that year the cars used had been of the small subway type, weighing about 40 tons and run in trains, with wooden trail cars weighing about 21 tons. The equipment added for the Pennsylvania Station service was of the larger suburban type, similar to steam equipment, weighing about 55 tons and at first was run in trains of all motor cars. From 1910 on, the percentage of the larger cars increased. In 1914 the wooden trail cars were retired from service and in 1919 many steel trail cars added in trains with the M.P.54 cars. The result of these changes in equipment used is clearly indicated in the average weight of cars in tons, which rose to a maximum in 1918 and then fell off a little with the increased number of trail cars used. It is interesting to note the increase in power consumption in the two war years of 1917 and 1918, when there was less opportunity for closely supervising the operation from day to day.

TABLE II—COMPARISON OF ENERGY CONSUMPTION IN WATT-HOURS PER TON-MILE AT POWER HOUSE, MAY TO OCTOBER, INCLUSIVE, AND AVERAGE COASTING PERCENTAGE FOR YEAR

Year	Energy Consumption Watt-Hours per Ton-Mile	Coasting Percentage
1910	102.8	....
1911	96.1	....
1912	96.9	....
1913	97.0	....
1914	94.6	35.4
1915	94.6	36.6
1916	91.8	36.1
1917	95.6	33.6
1918	94.0	34.6
1919	91.0	33.3
1920	90.0	32.4
1921	88.3	33.2

Note greater number of trail cars operated in 1919, 1920 and 1921.

The energy consumption for the year includes that used for heating, which varies with the weather conditions and is thus not entirely under the control of the railroad. In order to eliminate the effect of this variation Table II has been prepared, showing the energy consumption in watt-hours per ton-mile during the months from May to October inclusive of each year from 1910 to 1921. In these months very little power is used for heating. For comparison, the coasting percentage is also shown in this table. This table shows the same increase in consumption during the war years 1917 and 1918 as is shown in Table I.

Table III has been prepared to show the relation between the traffic in ton-miles, the miles of main track electrified and the rated capacity of the substations during the years 1911 to 1921 inclusive. This shows that while a material reduction in the energy consumption per ton-mile has been made, the traffic in ton-miles per mile of electrified track has more than doubled. Similarly the ton-miles run for each kilowatt of substation capacity has increased over 60 per cent. This increase of traffic density has had a tendency to increase the losses in the system so that an increase in power consumption would have been anticipated rather than a decrease, the facilities not having been expanded in proportion to the increase in traffic.

AVAILABILITY OF CHEAP AND CONVENIENT POWER IS AN ASSET

The Long Island Railroad has taken advantage of the electrification of its lines to utilize the cheap power thus made available for many purposes. Of the total power supplied during 1921, namely, 115,747,710 kw.-hr., 94,958,710 kw.-hr., or 82.04 per cent, was used for traction; 11,418,000 kw.-hr., or 9.87 per cent, for the supply of subsidiary and affiliated railroad companies and tenants of railroad buildings, and 9,371,000 kw.-hr., or 8.09 per cent, for the operation of signals, lighting of stations, office buildings and shops, heating of small shelter sheds and ticket offices at outlying points and

TABLE III—TRAFFIC-MILES OF MAIN TRACK ELECTRIFIED AND SUBSTATION CAPACITY, 1911-1921—LONG ISLAND RAILROAD

Year	Ton-Miles	Miles of Main Track Electrified	Substation Rated Capacity Kilowatts	Ton-Miles per Mile of Electrified Track	Ton-Miles per Kilowatt of Substation Capacity
1911	383,003,150	158.50	36,500	2,418,000	10,500
1912	438,404,725	160.50	40,000	2,731,000	10,960
1913	504,224,813	174.08	46,000	2,898,000	10,960
1914	592,723,272	189.82	52,500	3,124,000	11,290
1915	624,215,806	191.59	52,500	3,258,000	11,880
1916	679,259,104	191.59	52,500	3,544,000	12,930
1917	706,075,016	193.60	54,500	3,648,000	12,960
1918	723,355,454	196.14	56,000	3,687,000	12,910
1919	814,664,500	197.62	56,000	4,126,000	14,550
1920	906,698,948	197.62	56,000	4,589,000	16,200
1921	965,130,836	197.62	57,500	4,882,000	16,780

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as power supply for operating motors in the shops and other points where required. The saving, as compared with purchasing this power in small quantities at various points from local light and power companies or generating it locally in isolated plants, is most substantial. Furthermore, the presence of a cheap supply of power adapted to such usages has encouraged the use of many electrical labor-saving devices.

CO-OPERATION HAS PRODUCED GOOD RESULTS ON THE LONG ISLAND

The operation and maintenance of the power system of the Long Island Railroad, from the inauguration of the electric service, has been under the direct supervision of the electrical superintendent, who is also responsible for the efficiency and sufficiency of all classes of electrical apparatus or devices in the heavy electric traction, power and lighting system. He reports directly to the general manager. The electrical department, therefore, has been free to approach the problem of power conservation from the independent standpoint and co-operate to the fullest extent with the various departments interested. In the early period of electric operation some difficulties were experienced in persuading the operating officials and train crews to break away from old steam-railroad practices, but a campaign of education accompanied by reliable statistics of power consumption has been most effective. The continued co-operation and study of the operating problems, coupled with close supervision over a series of years, has made possible the reduction of power consumption outlined above.

Only through the closest co-operation between the officials responsible for the power supply and the operating staff can the full possibilities of electrification from an economic standpoint be attained. The proper adaptation of operating methods and practices to the use of electricity as a motive power achieved through such co-operation has, it is believed, had as much to do with the success of electrification on the Long Island Railroad as the particular system of power supply or any other single factor.

Studies made in connection with the operating and economic possibilities of electrification have quite naturally extended to other systems and have been helpful. Owing to the many variables entering into the question of power consumption, such as character of runs, grades, curves, number and location of stops, etc., it is manifest that any attempt to compare the performance with that of other electrified systems would be of little avail. Not only is this the case but the efficiency on a given railroad may be so influenced by operating methods as to further complicate such comparison and make it of little value.

Feustel Philadelphia Valuation Presents Valuable Analytical and Cost Data

Argues Against Reproduction Cost in Favor of Historical Investment—Past History of Company's Investment and Earnings Fully Analyzed—Would Not Allow Return to Capital for Good Management and Operation Now Adequately Paid for to Men and Management

THE report by Robert M. Feustel on the valuation of the Philadelphia Rapid Transit Company, briefly reviewed in the issue of this paper for May 27, is largely an argument against the use of reproduction cost as a measure of valuation of electric railway property and an argument for the use of historical investment as a more proper basis. The report, however, is filled with statistics and information which are of value to all electric railway companies. Mr. Feustel has devoted a large part of his report to a check of the company's reproduction figures and in so doing has set forth some very valuable figures on reproduction cost in general over a wide period of years. In connection with his historical investment figures he gives a complete report of all pertinent data with reference to the Philadelphia Rapid Transit Company. Summed up, Mr. Feustel's study brings him to the conclusions as to values which appear in the table on page 876 of the May 27 issue.

The report starts off with a discussion of the meaning of valuation, in which no particularly new ideas are expressed, but emphasis is placed upon the statement that: "The property valuation, so called, is necessary only as a step toward the real object sought for, which is the valuation of the service rendered by and with the property for the purpose of fixing a reasonable compensation for the service rendered."

While disagreeing with the use of reproduction figures as a basis and while not conceding at any stage the relevancy of the company's figure of reproduction cost, the city, through Mr. Feustel, has thought itself obliged to make a careful check of the items making up that figure. This, Mr. Feustel says, is to give the commission a reference basis from which may be developed a fair cost of reproduction figure which the commission, in its duty of considering all pertinent facts in arriving at a valuation to be used, may have before it.

Before starting that study, Mr. Feustel points out that although the company has chosen June 30, 1919, as the particular day upon which the valuation or reproduction figures are to be determined—prices as of June 30, 1919, being used—more than 95 per cent of the entire property was in place on June 30, 1915, so that less than 5 per cent was installed under war-time prices. To support this statement the report includes a chart of "Per Cent of Total Investment in Place Each Year," shown herewith as Fig. 1.

In checking the company's figures, Mr. Feustel has no quarrel with the company in so far as prices of material are concerned, but with the labor and real estate estimates he differs. The check with the city is carried in detail through the various accounts of the Interstate Commerce Commission's classification in a manner too detailed to outline in the limited space here available. On the general subject of property accounts, however, Mr. Feustel debates the use of the 15 per cent contractor's profit because upon his analysis he seems to find all services which this 15 per cent would pay for included, under other heads, in the accounts themselves. There are also a few items which are elimi-

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nated from the inventory for various reasons which are discussed in detail. Issue is taken with the company regarding its interest-during-construction figures, determining that 10 per cent would be ample.

Summarizing his study, Mr. Feustel finds a difference of something over $65,000,000 between the company's figure and his figure, arriving at $187,553,326 as his estimate of reproduction cost June 30, 1919. Of the difference $14,000,000 is in paving; $3,500,000 is in unused property; $2,000,000 in land; $2,500,000 in grading; $1,160,000 in track and roadway labor; $900,000 in engineering; $500,000 in early organization costs; $850,000 in taxes; $6,500,000 in interest during construction; $14,000,000 in cost of financing; and he eliminates entirely the $15,013,644 loss of fair return claimed by the company. Thus more than half of the difference between company and city is in overheads.

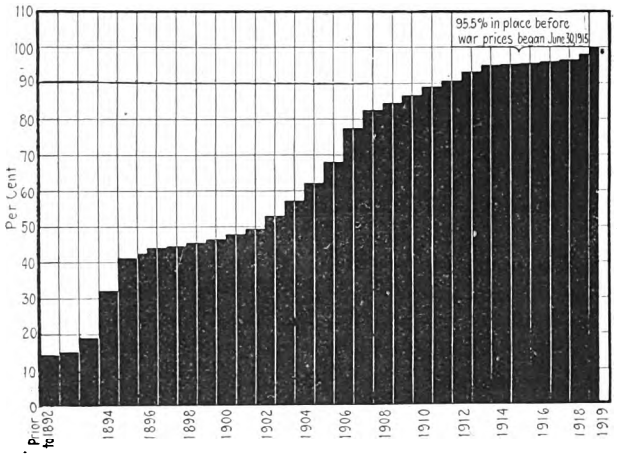

FIG. 1—PER CENT OF TOTAL INVESTMENT IN PLACE EACH YEAR 1892-1919

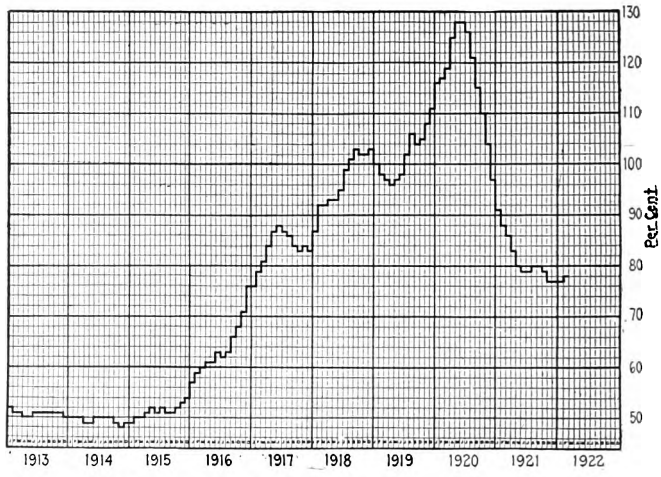

FIG. 2—TREND OF COST OF REPRODUCTION, MONTHLY VARIATION 1913-1922

DEPRECIATION MUST BE DEDUCTED

Mr. Feustel, however, is not satisfied to use reproduction cost new, but would deduct from that sum the depreciation which has actually taken place. In arriving at his depreciation figure, he has used the straight line method of theoretical physical depreciation, computed upon the estimated lives of the various elements of the property. He arrives at a figure of 3.23 per cent as the annual per cent allowance on the depreciable property. He presents in connection with his study on this question an elaborate table to arrive at the composite life of the property.

Having arrived at a figure for the June 30, 1919, reproduction cost, Mr. Feustel then turns his attention to an elaborate analysis of the variation in reproduction cost estimates, due to changes in prices. He finally evolves a curve showing the synthetic trend of cost of reproduction from which, having determined the cost of reproduction at any given date, he can find a multiplier with which he may multiply this figure to find the cost at any other date. He presents and studies a large number of the well known price indexes and other trend curves such as cost of living, cost of all commodities in various countries, etc., and then makes a detailed study of the trend of cost of reproduction of railway property. Taking June 30, 1919, as 100 per cent, each element in the cost of reproduction of railway property for the years 1905 to 1920 inclu-

TABLE I—TREND OF PRICES OF EACH ELEMENT OF ANALYTIC TREND OF COST OF REPRODUCTION. JUNE 30, 1919=100 PER CENT

	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
Labor	33	33	33	33	33	33	36	38	38	38	38	43	51	78	96	123
Teams	56	56	61	61	67	67	67	67	67	67	67	67	78	100	100	133
Concrete materials	49	49	51	48	45	48	45	50	53	50	50	56	71	99	100	112
Trap rock	53	51	51	47	46	52	45	52	55	49	51	55	71	94	100	112
Yellow pine ties	47	47	43	38	41	40	44	47	48	42	53	53	82	85	100	141
Structural steel erected	56	65	75	55	54	55	53	54	55	55	63	85	127	120	100	135
Chestnut ties	66	66	63	60	57	55	56	57	59	55	54	54	78	102	104	111
Girder rail	60	59	59	59	59	59	60	59	59	59	58	65	89	108	105	108
Splice bars	53	53	53	53	53	53	53	53	53	53	53	60	87	121	100	100
Special work	42	47	47	53	53	52	52	51	51	51	49	59	96	116	106	100
Granite blocks	48	48	48	48	48	48	48	48	62	62	62	62	62	90	105	124
Asphalt paving	77	69	74	73	51	45	51	61	85	80	68	78	73	122	103	98
Machinery	40	40	45	45	45	45	45	45	45	40	45	51	98	112	100	118
Lumber	36	40	37	35	34	35	33	40	39	36	36	43	71	91	100	112
Building labor	47	52	52	52	52	52	52	55	55	58	58	64	72	90	100	133
"All commodities"	40	41	44	43	46	47	45	48	47	47	48	58	83	92	100	114
Signals	46	46	46	46	46	46	46	46	46	46	58	70	82	91	100	108
Ingot copper	81	100	106	68	67	66	64	84	80	68	88	141	150	126	98	92
Distribution labor	43	43	43	43	44	44	44	45	49	50	50	53	65	87	105	121
Tubular steel poles	46	42	46	50	46	43	40	40	40	37	42	54	83	92	100	104
Pole gang labor	33	33	33	33	33	33	33	34	39	39	39	41	56	82	102	118
Vitrified clay duct	52	58	54	54	53	53	53	53	52	52	52	52	88	100	100	129
Creosoted wood duct	48	48	48	48	48	48	48	48	48	48	48	55	66	92	100	137
Buildings	52	56	54	51	52	52	51	54	54	52	53	64	81	94	105	123
Gray iron castings	65	67	75	45	45	45	50	48	50	50	70	75	124	109	100	160
Cars	41	45	47	45	45	46	46	46	46	46	46	70	100	100	100	116
Car motors	52	52	55	52	49	49	48	48	48	48	48	62	76	97	100	111
Office furniture	59	59	59	59	57	57	57	57	56	56	60	66	78	88	100	120
Turbo-generators	50	50	50	50	50	50	50	50	50	50	50	66	86	104	100	104
Engines and generators	33	33	33	33	33	33	33	33	33	33	33	58	86	104	100	104
Boilers	41	41	41	41	41	41	41	41	41	41	41	62	87	94	100	107
Power plant labor	40	40	42	42	42	45	45	46	49	49	54	59	67	84	100	124
Wrought steel pipe	50	60	64	60	54	49	45	48	48	47	52	87	114	114	100	100
Rotary converters	55	55	55	55	55	55	55	55	57	56	56	68	92	102	100	112
Electrician labor	56	56	56	56	56	56	56	56	56	56	56	70	70	94	100	140
Switchboards	58	58	58	58	58	58	58	58	58	58	53	64	85	105	100	122
Oil switches	53	53	53	53	53	53	53	53	56	56	56	70	85	106	100	122
Conduit and manholes	40	41	40	40	40	40	41	43	43	43	43	47	62	86	98	124

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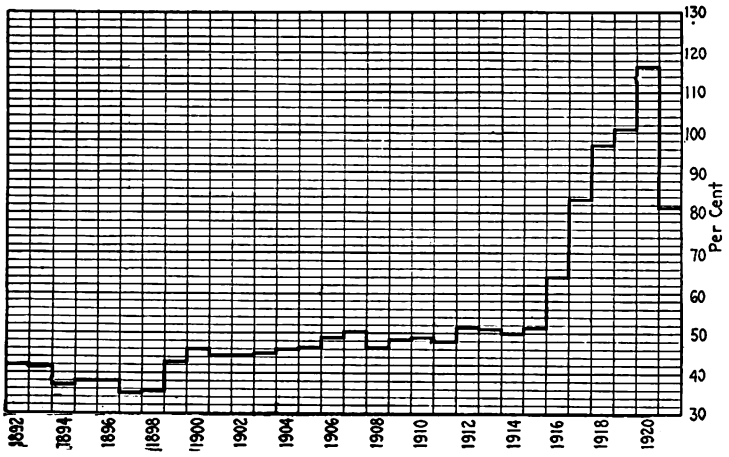

FIG. 3—TREND OF COST OF REPRODUCTION, ANNUAL VARIATION 1892-1921

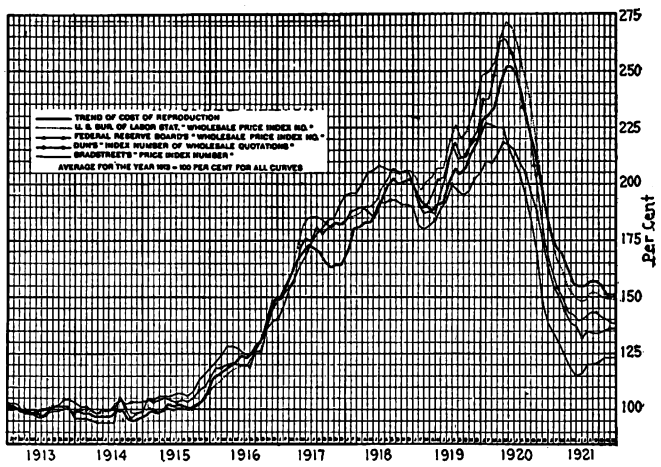

FIG. 4—TREND OF COST OF REPRODUCTION COMPARED WITH VARIOUS PRICE TRENDS 1913-1922

sive is listed, as shown by the accompanying Table I.

However, it would not be fair, he argues, merely to average these various items because some of them have a much greater weight in the total cost of reproducing the property than others. He has accordingly quite carefully worked out what he calls the "synthetic" trend by weighting each of the elements entering into the Philadelphia Rapid Transit property in the proportion in which each particular element is found in the property. Of the curves which he presents in this analysis three are presented herewith showing (Fig. 2) trend of cost of reproduction, monthly variation 1913-1922; (Fig. 3) trend of cost of reproduction, annual variation 1892-1921; (Fig. 4) trend of cost of reproduction compared with various price trends 1913-1922. All the quotations used in the construction of his trend are also shown in the report.

Using this trend of cost of reproduction curve, and using as a base his estimate of cost of reproduction as of June 30, 1919, physical property only, he finds the cost of reproduction of the physical property as of the first quarter of 1922 to be 78 per cent of that June 30, 1919, or $113,313,915. Adding overheads he arrives at a total cost of reproduction of $147,870,575.

REPRODUCTION THEORY UNSOUND

However, even after all of this study, Mr. Feustel finds and argues that the reproduction theory anyway is totally unsound for adoption in fixing a rate base and should be used by the commission, for good economic reasons, "solely as a collateral or reference figure, to test the sufficiency of the available investment figures."

Stating that the computation of reproduction cost is an estimate at best and based very largely on assumptions prescribed for the estimator, he argues that the best method of determining a rate base is to use historical investment. To support his contention that a reproduction cost as of any date is far from any adequate measure of what has actually gone into the property, Mr. Feustel presents two charts, Figs. 5 and 6 herewith, which are self-explanatory.

HISTORICAL INVESTMENT A SOUND BASIS

A rate base, however, computed on a record of cost or investment is not subject to the various objections of a reproduction cost. It is not an estimate; it requires no definitions as to dates; it is not subject to fluctuations in the level of prices; it requires no theoretical assumptions or hypotheses; it makes for economic stability; it is a fixed and constant landmark upon which a commission can safely found its judgment and to which it can safely apply the rate of return which, from time to time, it considers necessary from its knowledge of business conditions in all utilities, to accomplish the result sought to be attained, which is a reasonable rate of fare.

Mr. Feustel next turns to a detailed study of the

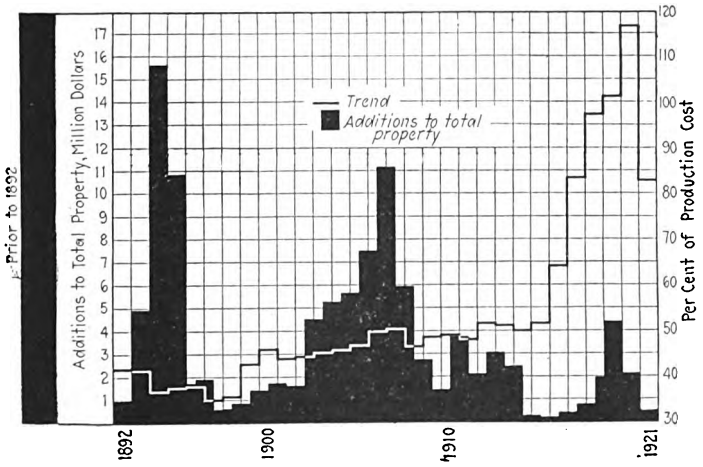

FIG. 5—DOLLARS OF CONSTRUCTION EACH YEAR AND LEVEL OF PRICES—AS SHOWN BY COST OF ADDITIONS TO TOTAL PROPERTY AND TREND OF COST OF REPRODUCTION

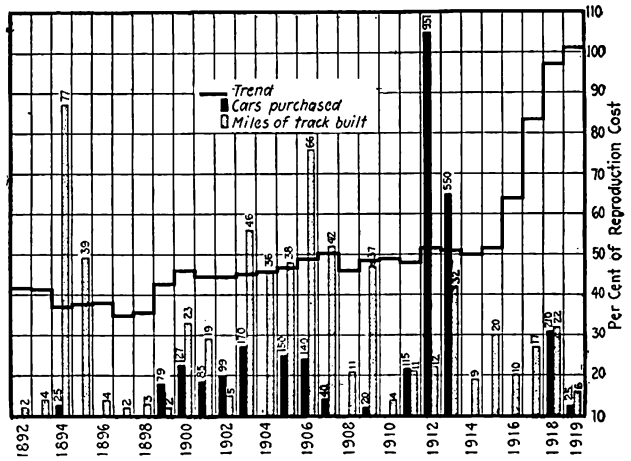

FIG. 6—DOLLARS OF CONSTRUCTION EACH YEAR AND LEVEL OF PRICES—AS SHOWN BY MILES OF TRACK BUILT, NUMBER OF CARS PURCHASED, AND TREND OF COST OF REPRODUCTION FOR ENTIRE PROPERTY

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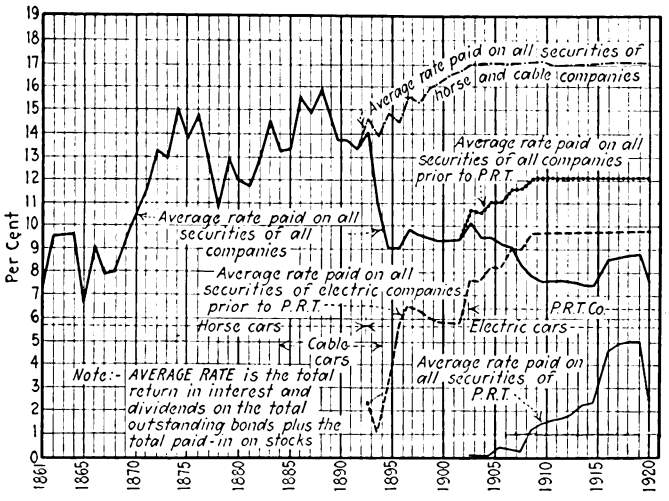

FIG. 7—RATE OF RETURN ON ALL SECURITIES P. R. T. AND ALL UNDERLYING COMPANIES

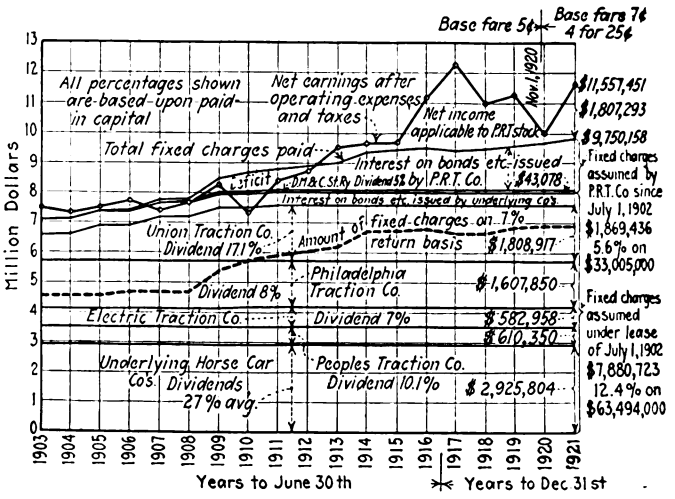

FIG. 8—NET EARNINGS AND FIXED CHARGES P. R. T. AND UNDERLYING COMPANIES

cumulative investment or historical cost and to a return on that investment. He finds it possible to locate practically the original records of more than 80 per cent of the figures necessary to determine these amounts. First he shows the very complex organization, comprising 122 corporate entities, of which the Philadelphia Rapid Transit Company is composed, and traces or states the facts with reference to the records of each of these companies. Studying this investment and bringing all figures into an adjusted total cumulative investment, he finds a total figure of $128,005,609.

This amount has been separated by periods as shown in Table II:

TABLE II—DIVISION OF HISTORICAL INVESTMENT INTO PERIODS AND GENERAL ACCOUNTS

1893–1896—Electrification of horse and cable lines		$32,619,558
1893–1896—New construction		948,512
1896–1902—Extensions and betterments—Union Traction Co., etc.		7,644,251
1902–1911—Construction of Market Street elevated subway		23,445,104
1902–1920—Extensions and betterments—Philadelphia Rapid Transit Company		41,040,120
1891–1892—Extensions and betterments—horse and cable lines		1,390,920
1860–1890—Total investment of all companies:		
In horse railway	$15,587,479	
In cable railway	3,679,884	
	$19,267,363	
Less extension and betterments, 1891–1892	1,390,920	
		17,876,443
Developed properties acquired by Philadelphia Rapid Transit Company since 1902.		
1902—Doylestown & Willow Grove Railway	$500,000	
1906—Darby, Media & Chester Street Railway	1,715,000	
1911—Chester & Philadelphia Railway	825,701	
		3,040,701
		$128,005,609

Of course the expenditures for road and equipment from the date of first incorporation of the first Philadelphia street railway in 1854 down to the year of 1890, amounting to $17,876,443, are not recorded in complete detail, although about 63 per cent of them are in reasonably complete detail and the rest in lump sums. As evidence of the reliability and completeness of the records, however, he points out that the total investment in horse railways of $15,587,479 is equivalent to approximately $47,250 per mile before adding anything for working capital. Of the total $128,000,000 Mr. Feustel finds about $20,000,000 of superseded property.

There is also presented a complete analysis of the capitalization of the company showing where the capital stock and bonds are owned. This table shows a total figure of $125,240,237 as being the entire paid-in capital of the Philadelphia Rapid Transit Company. Mr. Feustel also analyzes the profit from operation of the various companies from 1892 to date and shows elaborate tables of income, operating expenses, taxes and net available return from 1891 to date. As a conclusion, he finds that the net average return over the whole period, 1891 to 1920, was 8.90 per cent on the cumulative investment.

ORIGINAL COST AS INTERPRETED BY MR. FEUSTEL

Mr. Feustel then turns his attention to presenting a figure to represent the original cost. Original cost, as used by him, "is the figure obtained by applying to the present-day inventory of physical property unit costs for material and labor which were current at the time the different items under consideration were installed in service. There is included in this total, of course, allowances for the customary overhead charges." The inventory used was the same as that used for determining reproduction cost earlier in the study.

It was found that a very large percentage of the material prices could be determined direct from the book figures of the company. On this basis, the total physical property is found to be $84,433,785. Adding overheads, the original cost new is found to be $108,784,068. Again, this whole inventory is analyzed and discussed by account. In each case is told what part of the total account has been found on the company records. These percentages range from 60 to 93 per cent. The final table shows 69 per cent taken from records and 31 per cent estimated.

As the last element of his discussion on valuation Mr. Feustel takes up the question of "going value." He finds that no adequate definition of this was presented by the company although apparently it is asked for on the basis of a measure of early losses and argued for on the basis more of good will than of going value. To refute the claim of early losses and to analyze the earnings and fixed charges of the Philadelphia Rapid Transit Company, he gives a complete table on the return of total paid in capital from 1861 to 1920 inclusive, and presents two charts shown herewith as Figs. 7 and 8, giving the rate of return paid on securities and the net earnings and fixed charges. He states that the earliest lines started paying from the day they began operation, 7.48 per cent being paid in 1861 and an average of over 12 per cent being earned and paid from 1861 to 1890 on all the money invested in horse-car lines. With these and other arguments

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Mr. Feustel tries to show the inadequacy of any such measure of going value. Again, if the going value is to depend upon consolidation and reduction in operating expenses which can be effected therefrom, it necessarily has an offsetting figure by the amount of investment in superseded and duplicate property taken over during consolidation.

Therefore, Mr. Feustel argues, if going value is to be allowed it might be used as offset to depreciation on original cost or as an offset to superseded property on the historical cost, or on some other basis. It would neither penalize the company on high past returns nor reflect on intercompany contracts. However, such an item is not for engineer witnesses to create; it is a device to be resorted to only by the commission.

FINDS NO "SUPER-MANAGEMENT" IN PHILADELPHIA

Two other elements make up Mr. Feustel's report. One of these is his discussion on the efficiencies of operation. Mr. Feustel says that most of the claims of the company for economies and efficiencies are based on comparison with antique methods in vogue ten years ago, and that in the main while the quality of service has been greatly improved, the volume of service available has not increased in proportion to the growth of the car-riding public. He points out that the operating methods in use by the Philadelphia Rapid Transit Company are similar to those used by other well regulated street railways and that service rendered riders in other cities compares favorably with that in Philadelphia.

Mr. Feustel does point out, however, that the relations between men and management on the property are excellent, and from this results a more economical and efficient service. "But," says Mr. Feustel, "the company's particular measure of this, in dollars of saving or intangible value, takes on the air of being some religious fetish rather than the presentation of facts showing actual results obtained from unusual operating methods." While agreeing that the service has been greatly improved over 1911 operation, Mr. Feustel says that this improvement was practically forced on the company. He gives the company credit for having efficient trainmen and for the co-operation which it has produced on the part of those trainmen. He also points out the excellent work of the company in its "Safety First" movement, saying that there is no doubt that it is in the front rank in this kind of work.

However, even admitting some of the efficiencies claimed for what Mr. Feustel terms "super-management," he says the men and management are well paid for their efficiency and that the car rider in Philadelphia is paying on the average certainly as much as car riders in other communities for similar service.

FIGURES 10 PER CENT SMALLER OPERATING BUDGET COMPARED WITH 1921

In his discussion of the operating budget Mr. Feustel is somewhat reluctant to make any definite prediction of what should occur in 1922, but for reasons which he presents he believes that the operating budget should be about $3,500,000 less than the company's 1921 expenditures, or $27,800,000.

Finally, turning to the rate of return, Mr. Feustel questions the usefulness of the testimony of bankers regarding rate of return. There are too many other factors to be considered, he says, one of the principal items being the specific method of calculating the valuation base. He criticises the present financial set-up of the Philadelphia Rapid Transit Company as being seriously unhealthy and unsound. With the present financial burdens which the company has to stand in the nature of its fixed charges, it is obvious that a 7 per cent return on any reasonable valuation would not even keep the company's head above water, but such facts as these can have no true bearing on determination of the fair rate of return; there are too many other things to consider.

Finally, Mr. Feustel can find no reason why there should be any departure from the Pennsylvania Commission's fixed rule of 7 per cent return.

A large number of statistical tables are appended to the report from which it is apparently possible to answer almost any detailed question of the past financial and operating history of the Philadelphia Rapid Transit Company and its subsidiaries.

New Type Indicating Instruments Designed

TO MEET the demand for small size indicating instruments the Westinghouse Electric & Manufacturing Company is now producing a new type known as Type "CX" ammeters and voltmeters.

These instruments are suitable for use on switchboard panels, for radio communication sets and other small charging and lighting panels. They are also furnished for use with a magneto to indicate speed and with search coils to indicate temperature.

These instruments are capable of standing vibration such as is found on railways without impairing their accuracy or reliability, a combination of ruggedness and lightness of moving parts being provided in their construction. The case is punched from sheet metal and is made moisture-proof.

An external zero adjuster on each instrument enables the operator to reset the zero position of the pointer if it is displaced due to transportation or shock. All parts are mounted on a molded sub-base, assuring sufficient insulation. The instrument is fastened to the panel by means of three machine screws furnished with the instrument. The standard finish is dull black marine.

The ammeters are self-contained for currents up to 30 amp., but can be used with external shunts for higher currents. The voltmeters are self-contained up to 50 volts, but can be supplied for higher voltage with external resistance.

New Paint Remover

A PAINT and varnish remover, which is a new product to the electric railway industry but has been used somewhat in connection with automobile painting, is being introduced by the Clean Wash Paint & Varnish Remover Company, Inc., Syracuse, N. Y. In a trial made by the Rochester & Syracuse Railroad, one man cleaned one-third of a large interurban car in one hour and fifty-seven minutes, using a little more than ½ gal. of the remover. At this rate one man can strip a car per day, using about 4 gal. of the remover, which would mean a saving of five man-days of labor and considerable material for this operation. Among the advantages claimed for this over similar removers now on the market are that it does not leave a coating on the surface and the wood does not retain the remover so as to produce any detrimental effect on the car or paint when it is repainted.

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Railway Men in Historic Quebec

In Three-Day Meeting Canadian Electric Railway Association Considers Gasoline and Trolley Buses, Motor Design and Construction, Track Joint Welding and Valuation—First Manufacturers' Exhibit Exceeds Expectations — Major Burpee Elected President

BY FAR the most successful of the eighteen annual meetings of the Canadian Electric Railway Association was that held in Quebec City, June 1 to 3. Three hundred members and their friends, including a delegation of thirty or more from the United States, were in attendance. The latter group contributed both to the technical value and hilarity of the convention. The presence of "Americans" in such large numbers is explained by the fact that the executive committee of the American Association met in Montreal on May 31 and the Engineering Association committee on way matters met in Quebec on June 1 and 2, both of these meetings being arranged to bring about co-operation between the American and Canadian Associations.

A unique feature of the convention was the holding of the main and committee meetings, and the manufacturers' exhibit, in the Drill Hall, by courtesy of the Dominion Government. This was well adapted to the purpose, for the drill floor was of just the proper area and character for the exhibits, and an addition recently made provided, among other rooms, an excellent auditorium. It was located convenient to the Chateau Frontenac, the convention headquarters. The Drill Hall superintendent, Major Fecteau, contributed no little to the success of the meeting.

Thursday Morning Session

THE convention was honored at the opening on Thursday morning by the presence of Sir Charles Fitzpatrick, Lieutenant-Governor of the Province, and Hon. Joseph Samson, Mayor of Quebec City. Sir Charles showed a keen interest in the local traction situation, the difficulties of which, due to the topography of the city, he appreciated. He said that what the company lacked in equipment it made up in courtesy and good humor. In general, he considered the traction and power problems as substantially solved. While Canada is largely dependent upon others for coal, her water powers are well developed. But the housewarming problem is an acute one, and he hopes that electricity will play a part in solving it. Sir Charles pointed out how the prosperity of Great Britain and the United States have been largely due to wealth of iron and coal. Canada is handicapped due to lack of these, but is progressing nevertheless. The local power and transportation development under great difficulty illustrates this. While it seems a little incongruous to see modern electric cars in quaint old Quebec, they are doing a good work and are appreciated.

Mayor Samson traced briefly the early pioneer work in power development in Quebec and also felicitated the local company on its service.

Exhibits Officially Inspected

After these addresses the convention adjourned to the exhibit hall, where Sir Charles, Mayor Samson and the association officials were received by the exhibitors in turn and studied each exhibit in detail. Next, in the convention hall, President G. Gordon Gale delivered an address in which he congratulated the association on the results of admitting municipalities and manufacturers to membership. These he illustrated by statistics. He also advised the appointment of a permanent secretary.

Secretary's Report Shows Progress

Secretary L. E. Moreland's report contained a membership list of thirty-five active (railway) members and thirty-seven associate (manufacturer) members. He explained changes in the constitution and by-laws, drafted by the executive committee, to provide for four classes of membership: Active members, honorary members, associate members and associates; the last-named to comprise consulting engineers, commissioners and others not otherwise eligible. The annual fee for associates was set at $10. Instead of a flat fee of $100, the dues of active and associate members were placed on a graduated scale, varying from $25 for those with annual gross earnings under $100,000 to $150 for those earning over $1,000,000. An increase in the executive committee was also included to provide dominion-wide representation. (These changes were later ratified.)

Mr. Moreland also described the service activities of the association, involving questionnaires, legislation, technical studies, etc. A volume of proceedings covering five years (1916-1920) will, he said, be issued soon.

Next Honorary Treasurer A. Gaboury reported as to finances, showing the association to be prosperous. The amount on hand was about $7,600. Out of this convention and printing expenses must be paid, but there will remain a substantial balance, slightly less (said Secretary Moreland) than that of a year ago.

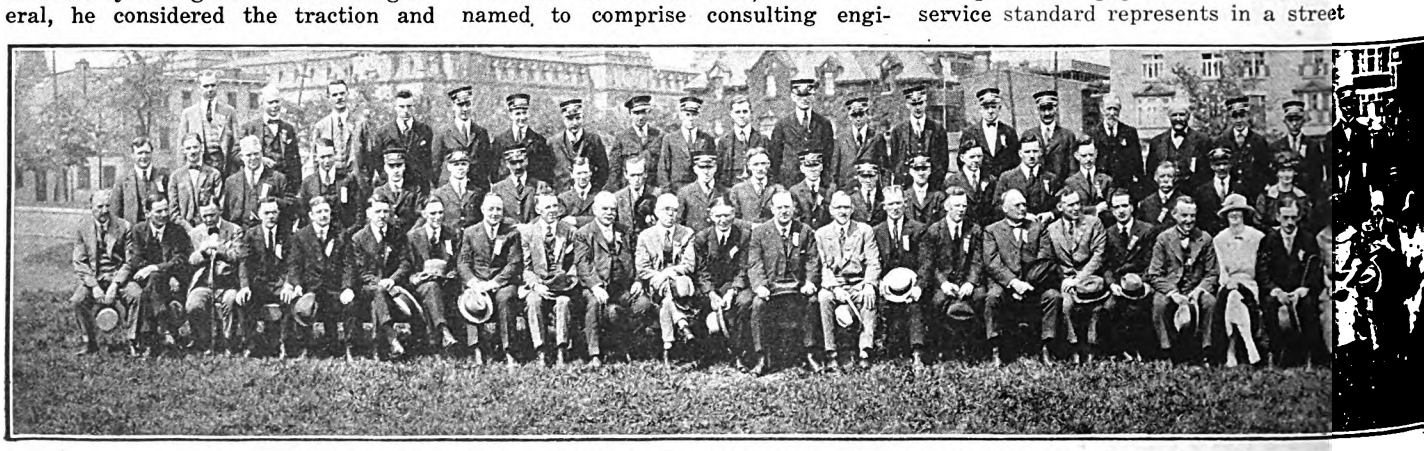
The morning session closed with the appointment of Past-Presidents Hutcheson, Eastman, Wilson and Gaboury (with Mr. Gale, ex-officio) as a committee to nominate the executive for the coming year.

Thursday Afternoon Session

THE paper on valuation by Dr. L. A. Herdt and Prof. E. G. Burr was read by the latter at the opening of the Thursday afternoon session. It is abstracted below.

Valuation of Street Railway Assets, Their Maintenance and Depreciation

The paper discussed the basis for appraisals of railway property and argued, in the reproduction cost method, for 100 per cent valuation. On this point the paper said that full service standard represents in a street



Members and Guests of Canadian Electric Railway Association Assembled in Convention in Quebec.

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railway property not more than 85 per cent of the reproduction cost, as at no time is a property actually new and it begins to wear before it is placed in service. The 15 per cent difference between its reproduction cost new and its value representing full service standard has been employed in the public service, and the property could not exist if the company had not made this 100 per cent expenditure. Hence it would seem right that in rate cases the value allowed should be the value of the physical property new and that the only deduction for depreciation should be the amount required to rehabilitate the property to a full operating condition of standard efficiency. This would safeguard the public from paying a return on the new value of obsolete or worn-out equipment, while giving the company a return on the value of the equipment used in the public service. This suggestion, the paper points out, amounts to a depreciation only on obsolete equipment. Where rates authorized in the past have been insufficient to allow the company to replace obsolete parts, each case should be considered on its merits. In a large property it is often possible to provide for replacements in the annual budget and pay for them as a current expense. This has been adopted in the Montreal Tramways contract.

The paper quoted in full Article 92, paragraph 2 in the Montreal Tramways contract. This article provides for the establishment by the Montreal Tramways of a "maintenance and renewal fund," maintained by a definite charge on a car-mile basis, so as to amount to at least $500,000. Sales of worn-out and discarded property, but not sale of land and buildings, are paid into this fund, and all maintenance is paid out of it, as well as renewals up to the full reproduction costs of the unit or article. Additional cost, if any, and less cost, if any, are charged to or credited to capital value, and in the latter case is used for the making of betterments, additions to or extensions of the plant as ordered by the Tramways Commission.

H. E. Weyman, Levis, P. Q., opened the discussion.

Mr. Weyman said, in part, that the valuation of a property must be impartial if it is to be effective. The railways are entitled to "a living wage." At the same time there is little doubt that in many cases property has been allowed to depreciate much below a good operating standard. In that case the ordinary operating and maintenance costs increase in practically the same ratio as the property has been allowed to depreciate, the final result being rehabilitation at a cost out of all proportion with the saving made in maintenance in previous years. "A stitch in time saves nine" still stands as a good motto. The Montreal Tramways (to which reference was made in the paper) even in its darkest days never starved the property, or permitted maintenance to accrue, but what a different tale is told of other properties.

Mr. Weyman pointed out that in the paper depreciation is divided up between "physical" and "functional" and that 15 per cent physical depreciation is allowed without reduction in "reproduction cost." If the property has been maintained at 85 per cent of full service standard 100 per cent reproduction cost is the basis of the valuation. This, he said, is in itself an advance.

As to functional depreciation, which is obsolescence and accrued maintenance, when this is high some one is paying abnormal operating expense. If, however, adequate reserves for depreciation covering all accrued functional depreciation have been established, which means that the company has been granted an allowance through the annual depreciation charge and at the same time received a return on its investments, and if this depreciation has not been used to liquidate bonds or other indebtedness but employed in making extensions or betterments, a valuation or reproduction cost should be allowed. On the other hand, if the company has not taken care of functional depreciation, but employed its net to the advantage of its stockholders, then the valuation is effected by the amount of functional depreciation.

If the functional depreciation is not taken care of, the bondholders are not properly protected. It is essential that careful and proper accounting be employed. A property or plant ledger should in all cases be employed, together with a perpetual inventory, and the functional depreciation should be taken care of in this ledger. Such records ought to aid in securing fair treatment at the hands of public authorities. Functional depreciation is an expense and should, as pointed out in the paper under discussion, be deducted from gross revenue before net profits are determined, and not from net profits. Finally Mr. Weyman suggested that a committee be appointed to consider the standard classification of accounts and the including of depreciation in its various forms as an expense account. This was referred by the chairman to the incoming executive.

Electric Railway More Than a Utility, Says Montreal Commissioner

Mr. Weyman was followed by Judge J. F. St. Cyr, chairman Montreal Tramways Commission. He explained the practical workings of the Montreal franchise, and said that the city was not keen for municipal operation, desiring rather to have co-operation. The electric railway was recognized not only as a utility but as a necessity. Hence it must be maintained at the highest possible standard of efficiency. Under this condition no allowance for depreciation is needed, but replacements may be capitalized at the added cost; that is, the difference between replacement and original costs. Hon. A. B. Ingram, chairman Ontario Railway and Municipal Board, said that under the jurisdiction of the board when rates are fixed, changes in valuation are referred to an independent board of valuators.

Speaking for the London (Ont.) Street Railway, Leonard Tait, secretary-treasurer, said that this property has been operating for a fare of seven tickets for a quarter, but that permission to charge 5 cents has just been granted. Previous to 1917 no fund for depreciation had been accumulated, but now an equivalent is provided in the requirement of its $1,500,000 mortgage, due 1935, that 5 per cent of the bonds be retired annually. A $300,000 depreciation fund has been built up.

How Motor Design Has Been Improved

The second paper was on "The Modern Electric Railway Motor," which was read by the author, J. K. Stotz, Canadian Westinghouse Company. It will appear in a later issue. Mr.

THIS PICTURE WAS TAKEN IN FRONT OF THE DRILL HALL, ILLUSTRATED IN THE ISSUE OF THIS PAPER FOR MAY 27

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Stotz amplified his formal paper slightly by enlarging on the subject of safeguarding commutator leads against breakage. He said that the fundamental requirement is to prevent vibration and concentration of stress. Careful binding, use of phospor-bronze sleeves, minimizing of bends, proper varnishing and baking, etc., all help.

In opening the discussion, W. G. Gordon, Canadian General Electric Company, said that his company has just completed a census of all street railway motors operated in Canada. This shows that 8,066 of the older type motors and 3,362 of the more recent type, with either series or parallel ventilation, are in use.

Experience with winter operation of the fully ventilated motor indicates that with the multiple ventilation satisfactory results are obtained by closing the intake openings at the commutator end of the motor frame. In some cases closing a portion of the exhaust openings in the pinion end of the motor frame is beneficial also.

To indicate the care with which motors are made, Mr. Gordon said that while the exterior of the modern railway motor may suggest ordinary workmanship, it is doubtful if any other line of machinery manufactured has closer fits and more accurate workmanship. Some of the tolerances in armature shaft fits are "plus 0.00025 in to minus nothing." For framehead fits in box-frame motors, "plus 0.002 to minus nothing" is allowed. The thread fit for framehead bolts and for screws is made so close that special taps and dies are required to insure tight-fitting threads. All of this is necessary because imperfectly fitting parts rapidly loosen and wear in the abnormally hard service to which railway motors are subjected.

Helical versus Spur Gearing

While disclaiming that he "held a brief" for spur gearing, Mr. Gordon said that complete comparative data can only be obtained after the helical gearing has been proved by extended trials over a period of several years.

Accurately cut helical gears running on correct centers and with shafts in true alignment will run quieter than ordinary spur gears. These, however, are conditions which do not usually prevail in the operation of railway motors, due to wear of armature-shaft and axle-shaft bearings. With helical gears it may be found advisable to renew bearings more frequently than with spur gears.

With straight-cut teeth endwise movement of the motor frame or armature shaft relative to the axle and gear does not produce any change in speed of the armature. In actual practice there is always more or less endwise movement of the motor along the axle and the armature shaft through its bearings. This movement results in a change in position of the pinion across the face of the gear, parallel to the axle. When such movement takes place with helical gearing it results in a quick change in speed of rotation of the armature, resulting in shock and vibration. As flange wear of armature shaft and axle linings, and wear of armature shaft and axle thrust collars, permit a change in position of the pinion across the face of the gear, it will probably be found advisable to adjust thrust collars and change linings more frequently than is required when straight cut spur gears are used. Helical gears cause an increase in end thrust and consequently wear of thrust collar and flange wear of lining will probably be increased with helical gears.

In considering gear noise it should be borne in mind that this is only one element in the noise of a running car and that some reduction in gear noise may not make a noticeable difference in the sum of the noises coming from the car. Further, an accurately cut helical gear should not be compared as to noisiness with an inaccurately cut spur gear. The vibration and shock resulting from well-cut spur gearing reasonably well maintained is small in comparison with the vibration and shock resulting from other causes such as rough tracks, curves, crossovers, switches, flat wheels, trucks, cars, braking, acceleration, etc.

At the instant when a tooth in a helical pinion begins or ends engagement with a tooth in a gear there is but a point contact. Even when helical gearing is in full and perfect mesh a tooth in the pinion has but a comparatively short bearing on its mating tooth in the gear. If the gear centers are separated the length of this bearing is shortened. At the extreme point of separation when the gear just goes out of mesh, there is but a point contact between the pinion tooth and the gear tooth. This condition prevails even when the axle and armature shafts are parallel. With a straight cut gear the length of contact between the gear tooth and pinion tooth is not changed by increasing the center distance between pinion and gear.

With straight cut spur gearing, assuming parallel shafts, there is a bearing between the pinion and gear tooth for the full length or face of the gearing regardless of inaccuracies in spacing of teeth due to imperfection in machining. Therefore, there cannot be less than one tooth in contact for its full length. As previously stated, with helical gears each tooth at any given instant has but a comparatively short contact with its mating tooth. If, therefore, there is inaccuracy in the spacing of the teeth there is but one tooth in contact and that but for a short length.

It is doubtful if a new helical cut pinion can be used on a worn helical cut gear with as little trouble as can a new straight cut spur pinion be used on a worn straight cut spur gear. Should difficulty be experienced in meshing such helical cut gearing it would materially shorten the life of the gearing. In changing motors or armatures it may be found that helical gearing will not satisfactorily interchange but that pinions and gears which have run together should be kept together.

In actual practice it is questionable whether helical cut teeth will prove to be as strong and reliable as straight cut teeth. When helical teeth are worn, imperfect meshing will be more pronounced then with straight cut gears. Whether or not helical gearing will have a life equal to spur gearing can only be determined by years of trial of a large number of helical gears under the widely varying conditions of operation which prevail in electric railway service.

In conclusion, Mr. Gordon said that while in no way condemning the use of helical gears with railway motors, he felt that such points as those mentioned should be considered.

Commutator Slotting Not New

In further discussion of details of Mr. Stotz's paper, W. R. McRae, Toronto Transportation Commission, said that commutator slotting was necessarily practiced on the early Vandepoele generators because the insulation was red fiber. He said that 7½ to 8 lb. per sq.in. brush pressure is used in Toronto. The only difficulty he foresaw in connection with helical gearing was collar wear due to end thrust. This may be eliminated possibly by proper lubrication of collars. The helical gearing on the Toronto Civic Railway's safety cars was otherwise satisfactory.

W. H. Sawyer, East St. Louis, Mo., said that commutator slotting was tried by the General Electric Company many years ago. The principal characteristic of the modern motor, in his opinion, is its "balance"; that is, the appropriate relative capacities of armatures, field coils, etc. While some details, such as oiling, still need improvement, executives ought to appreciate the great expenditure which the manufacturers have made in research.

Another speaker on this subject was T. C. Berkelay, English Electric Company, who said that the ventilated motor is new in England. Development has had to proceed in view of the facts that English railway men are conservative and that several track gages are in use. The company has developed three motor types (with both split and solid frames), and of these Mr. Berkelay gave some details. Bearings are packed with waste mixed with 10 per cent long-strand horsehair. Only one brush per holder is used. Banding is found to prevent commutator-lead breaking.

In conclusion, and in response to a suggestion by Mr. McRae that a committee on standardization of helical gears be appointed, Mr. Stotz said that the American Electric Railway Engineering Association is looking into this matter. He favored standardization and the making of engineering studies, but is convinced from operating data of the superiority of helical gearing.

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Friday Morning Session

THE subject of the trackless trolley was the first one taken up on Friday, the discussion being opened by a paper by D. E. Blair, Montreal Tramways.

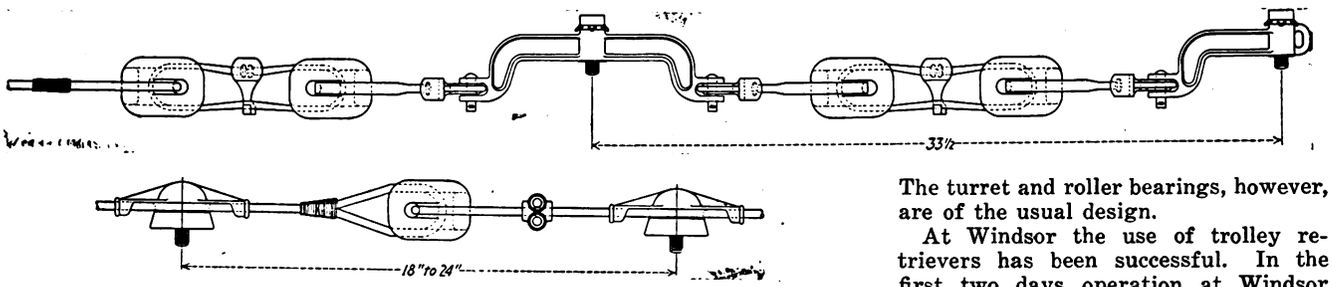
In his paper Mr. Blair gave a series of questions which must be considered in deciding the wisdom of using buses as auxiliaries to an electric railway. It is only in auxiliary service that he favored their use. There are many examples, he said, of rail lines upon which service is maintained only in view of commission rulings, contracts, etc. A decision in favor of the bus or trackless trolley in such cases will be involved with track renewals and regradings. Sometimes, also, passengers can be carried cheaper by direct bus lines rather than car lines which involve a roundabout route. Mr. Blair's paper will be abstracted at length in the issue of BUS TRANSPORTATION for July.

He supplemented the paper by stating that bus operation has come to stay and that the art of carrying passengers on rails has not been progressing as fast as that of carrying them in independently propelled units. As for the maintenance of bus engines, this will not be troublesome with good mechanics and intelligent operation. The experience of the Fifth Avenue (New York) Coach Company shows this. It is corroborated by Mr. Blair's experience in driving one automobile 65,000 miles in six years with no equipment trouble. Buses were introduced reluctantly in Montreal, but they were cheaper than rail lines for the particular service to be given.

The first two buses used in Montreal were turned over to men inexperienced with buses, but they were able to keep them up for two and one-half years, and the cost was 8.9 cents per bus-mile in 1921. The tires cost 2.88 cents per mile, as compared with about ¼ cent for car wheels. The troubles experienced were about the same in number and severity as with street cars. As a result of experience and study Mr. Blair did not see any possibility of successful competition of buses with street cars, their field being only supplementary thereto.

The discussion of Mr. Blair's paper opened with another paper, on the trackless trolley, by M. W. Manz, Ohio Brass Company. After referring to the general situation regarding this type of vehicle he said that the trackless trolley will usually be operated by street railway companies. Seldom will the operation of the trolley bus reach such magnitude that it can carry the additional overhead which would be imposed by the maintenance of a separate operating organization. Hence a prime requisite for overhead and collection should be that the materials and construction should be as nearly standard as possible.

Overhead can be laid out with standard overhead materials for reliable operation when two harps, two poles and two bases are used. This principle is illustrated in the automatic trolley reverser used on railway cars in Bradford, England, and in the collecting devices used in Leeds, England, and Shanghai, China, on trolley buses.



OVERHEAD FOR TRACKLESS TROLLEY. ABOVE, PULLOFF SUSPENSION FOR CURVE BELOW, CROSS-SPAN CONSTRUCTION

In some trolley bus installations one base has been used for two poles but in the later English installations separate bases as well as separate poles are generally employed. Where the two elements are interconnected, each one is very directly affected by a disturbance in the other.

In the swiveling type of harp being used by the Windsor Hydro-Electric Railways the center of the spindle passes through the center of the axle for the wheel. This assures that the center of pressure as transferred from the base will align itself with the wheel in any position of the base. It is essential that the wheel rotate freely without trailing or caster action.

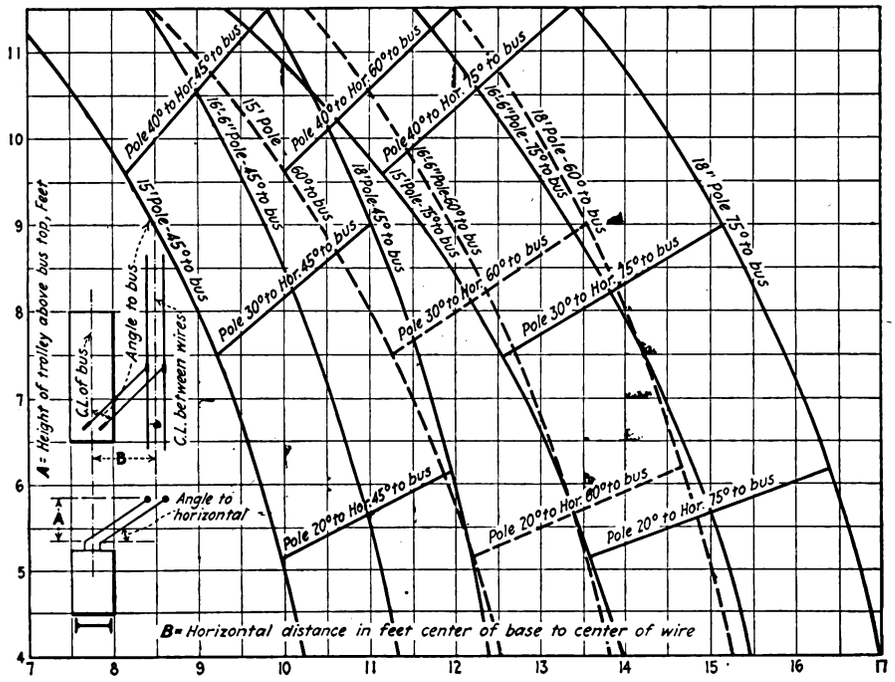
A by-pass takes the current from the wheel to the motors. To reduce pitting to a minimum a piece of No. 0000 solid copper is carried from the contact springs on the wheel down through the center of the spindle to contact with the finger to which the motor lead is attached.

The harp is insulated from the pole by means of a bakelized canvass tubing, plugged at the end and projecting down over the pole.

The trolley base used at Windsor can be operated when spaced about 16 in. center to center. Its narrowness is due to the arrangement of the springs. The turret and roller bearings, however, are of the usual design.

At Windsor the use of trolley retrievers has been successful. In the first two days operation at Windsor considerable difficulty was encountered at two insulated crossings. The retrievers proved their ability to protect the poles and the overhead while operating through this special work at a rather high rate of speed. After the second day at Windsor there were no dewirements for the first two weeks of operation.

With the swivel harp the overhead materials may be kept standard, excepting at frogs and crossings. The only difference there is that springs are added to the frogs and crossings to provide a positive operation in the direc-



A SET OF CURVES FOR USE IN SELECTING TROLLEY BUS POLE LENGTH

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tion intended. The swivel harp is so sensitive that its tendency to continue in a straight line makes the matter of a turnout a rather difficult problem unless springs are employed.

The type of suspension which is being used at Windsor is shown in the accompanying illustrations. The lower shows the tangent suspension as used, excepting that there is an insulated bolt hanger and a porcelain with a serving as is shown at the left of the insulator, the Crosby clip method of attachment at the right side being a merely suggested arrangement. This suspension gives triple insulation between positive and negative wires. The wire spacing is approximately 24 in. on tangent and 32 to 33 on curves.

The curve suspension being used at Windsor is as shown in the figure, except that only one strain insulator is used next to the curve pull-over.

In the selection of trolley-pole length the trolley pole should be at an angle of about 30 deg. with the horizontal. Thus with a bus 8 ft. wide in a 28-ft. street, the distance from the center of the bus to the center of the wire would be about 10 ft. From the accompanying curves, it appears that a 16 ft. 6 in. pole would fulfill these conditions when it made an angle of 45 deg. with the bus. With a swivel harp it is easily possible to operate 60 deg. to the bus at a moderate speed and even 70 deg. may be approached in case of necessity. If an 18-ft. pole made an angle of 60 deg. to the bus and one of 30 deg. to the horizontal, the trolley wire would be necessarily about 9 ft. above the top of the bus and it would be possible to operate the center line of the bus 13½ ft. from the center of the wires, or with the wires 17½ ft. from the curb.*

The Technical End of Motor-Bus Construction

The discussion of Mr. Blair's paper was continued by G. Gordon Bell, vice-president Eastern Canada Motor Truck Company. He took for his topic the features which require consideration in selecting a motor bus. He said that from the large number of inquiries received by his company he confidently expected the bus to be used extensively as an adjunct to street railways.

In designing a motor bus, said Mr. Bell, there are two prime factors to consider, economy in operation and strength with minimum of weight. These factors are interdependent.

The motor truck has been, and still is, largely used in bus service, but as it is not designed for this particular work it is not suitable therefor. The features to be incorporated in a properly designed bus, in addition to those mentioned, are: Flexible and long springs, preferably with some system of progression to take up loads as they increase. As the machine will be operating over good roads, the chassis frame can be lowered considerably without jeopardizing ground clearance. Frame to be wide enough to suit a bus body. Track of rear wheels to be wide enough to facilitate low floor level and non-interference of wheel race with seating arrangement. Machine to be geared to suit the particular conditions over which it is to operate.

Mr. Bell emphasized the importance of proper gearing. To achieve the most economical results a machine must be geared for its particular run, or for runs over which the gradients will be approximately equal. The machine designed by the company for the Toronto Transportation Commission was geared without information as to the particular run over which the machine was to operate. An 8:1 ratio was used at the outset, but later a 7:1 ratio was used, with a saving in fuel of about 20 per cent.

On the subject of tires and wheels, Mr. Bell said that the solid tire with non-skid tread is most applicable for city use. The cushion wheel adds slightly to the weight, but gives easy riding qualities which are worthy of consideration. Cushion tires are satisfactory for the light machines, up to probably thirty passengers, but have not been developed sufficiently for machines of greater capacity. The pneumatic tire, with the probability of delays due to punctures and its greater expense for renewals, is not a profitable investment, except for suburban runs over rough roads, where its advantages in reducing shock to the machine over the solid tire and the greater speed at which the machine may be driven are apparent.

L. H. Palmer, United Railways & Electric Company, Baltimore, Md., reviewed the five years of motor bus operation there. His conviction is that cars can serve the public best, even in London and New York, but supplementary service with buses by the railway has a place. The company is extending its service, and on a new line will charge 10 cents fare and in general furnish seats for all. Baltimore will soon start a 6-mile trackless trolley extension. A decision as to type of overhead collector has not yet been reached. This will supply service to a real estate development, and the real estate people have put up $32,500 to cover the deficit of the first five years. Three buses have been purchased. The railway company would have preferred gasoline buses, but the promoters wanted the tangibility of the overhead construction. The bus situation in Maryland is simplified by the heavy state tax imposed.

Windsor Heard From Also

Experience with the trolley bus line in Windsor was described by W. R. Robertson of the Hydro-Electric Power Commission of Ontario. The commission collected a vast store of data on the subject, from which the conclusion was reached that the trolley bus is the most economical system of transportation possible, even though a 10,700-lb. bus costs $1 per pound as compared with 50 cents for a safety car. While gasoline motive power lasts but 100,000 to 125,000 miles, electrical equipment fails only through obsolescence. Electric power is cheaper, also. In Windsor the overhead cost $5,000 per mile.

In Winnipeg bus operation cost 25.71 cents per mile total, or 22.52 cents without depreciation and interest. In Minneapolis the total cost was 37 cents. In Richmond, Va., trolley-bus operation cost 13.2 cents and in Norfolk, 16.31 cents.

In Windsor the controlling factors were simplicity, safety and maximum of strength with minimum of weight.

The bus discussion closed with free-for-all rapid-fire contributions. Mr. Ingram explained the workings of his commission. W. G. Naegal, Canadian Brill Company, explained details of buses furnished to Toronto. Mr. Blair stated that the life of a well-maintained gasoline engine is practically endless. Mr. Palmer emphasized the importance of adapting engine equipment to operating conditions, stating that the per-gallon mileage in Baltimore had been increased from 5 or 6 to 9 or 10 by this means.

Canadian National Safety League

The morning session closed with an appeal by J. F. H. Wyse, representing the Canadian National Safety League, for more active co-operation from the railways. The Ontario League started in 1913, largely under Mr. Ingram's inspiration. Four years ago the larger organization secured a Dominion charter. Accidents have, as a result, been reduced or minimized. A motion for a committee on this subject was referred to the incoming executive.

Friday Afternoon Session

RAIL joints formed the topic for discussion on Friday afternoon. E. B. Entwisle, chief engineer Lorain Steel Company, read the paper which is abstracted elsewhere. It covered experience with the Johnson bar-weld joint and the more recent Jacobs joint. As engineer of maintenance of way for one of the largest users of the bar-weld joint, H. H. George, Public Service Railway, said that hundreds of these joints had been used successfully in open track. Surface-bent joints, badly pounded, had been reclaimed by their use. Expansion joints, staggered, are placed every 500 feet. These joints are made of split switch points. It is, said Mr. George, important to eliminate space between rail ends in all welded joints.

W. F. Graves, Montreal Tramways. said that his company is now trying the arc-weld joint. A stretch 2,700 feet long has been welded and furnished with one expansion joint. It has gone through two winters without breaks. A 1,000-ft. section of open track shows the same result. Rail ends are butted, a 24-in. flat steel bar is bolted firmly into position, and seam-welds are made top and bottom. Mr. Graves

*A more extended treatment of this subject will be found in an article by Mr. Manz in BUS TRANSPORTATION for June, 1922.

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said that much depends on the welderman, who needs a sixth sense for this work.

W. W. Wysor, United Railways and Electric Company, Baltimore, Md., said that his company also has used a number of arc-weld joints. He finds much variety in practice in this field and is trying to determine the best for use in Baltimore. Next came G. F. Gailor, Rail Welding & Bonding Company, Cleveland, Ohio, whose company is recommending a carbon-arc process. He said that as a result of extensive research work and of the reports of the service men who visit companies using the process, he expected soon to be able to give the industry some helpful suggestions as to procedure.

E. M. T. Ryder, of the Third Avenue (New York) Railway and vice-chairman of the committee on welded rail joints, said that an important thing to be determined in arc weld and thermit joints is the effect of the high temperature in welding. This the committee is undertaking, to meet the need for metallurgical data. Funds will be solicited for this work. It will be done under the most competent auspices.

Asked by Mr. Ryder as to the experience of his company along this line, Mr. Entwisle said that after a joint is made the rail must be heated for several feet from the joint to say 1,500 deg. F. to dissipate the localization of the heat effects. The stresses set up caused breakage until the post-heating practice was adopted.

How the Thermit Weld Produces a Continuous Rail

The discussion was closed by R. L. Brown, Metal & Thermit Corporation, who asked: "Is there a permanently standard joint?" He said that there is not, for a standard is only such until something better comes along. It is well to close the gap in a joint. The thermit insert weld, as well as the Jacobs weld, does this. In the former the joint is opened up a half inch and an insert which fills this space is slipped in. The melting action of the thermit does not extend to the rail head, but the fused insert is welded to the section below the head.

Saturday Morning Session

AT THE closing session of the convention, held Saturday morning, George W. Lyndon, president Association of Manufacturers of Chilled Car Wheels, showed by motion pictures the process of manufacturing chilled wheels. He said that there are 25,000,000 wheels in use and that the association members can produce 30,000 wheels per day. In manufacture each wheel carries a serial number, with or without the name of the customer, and a record is kept of its characteristics.

Business Session Last

Business matters were then taken up. Don M. Campbell suggested Toronto for next year's meeting. R. M. Reade, Quebec Railway, Light & Power Company, explained how the exhibits had been arranged for. He backed up Mr. Wyse regarding the Safety League and said that in Quebec the cost due to accidents is only 0.7 per cent of gross earnings.

Resolutions of thanks to all contributors to the success of the meeting were passed, and the following were elected to the offices named:

Honorary president, E. A. Robert, president Montreal Tramways; honorary vice-president, W. C. Hawkins of Hamilton; honorary council—Col. J. E. Hutcheson, Montreal; T. Ahearn, Ottawa; Acton Burrows, Toronto; G. Kidd, Vancouver; president, Major F. D. Burpee, Ottawa; vice-president, H. H. Couzens, Toronto; executive committee—E. P. Coleman, Hamilton; C. L. Wilson, Toronto; A. W. McLimont, Winnipeg; R. Mayne-Reade, Quebec; W. L. Weston, Halifax; D. W. Houston, Regina; A. Eastman, Kingsville, Ont.; H. E. Weyman, Levis; W. R. Robertson, Toronto; honorary treasurer, T. Hart, Three Rivers; auditor, Col. G. C. Royce, Toronto.

Major Burpee then took the chair, and said that attention would be devoted even more than before to preventing duplication of the work of the American Association. The desire is to concentrate on Canadian problems, particularly with reference to promoting better relations with patrons.

Among the Exhibits and Exhibitors

Exhibits in Drill Hall During Canadian E. R. A. Convention

THE association initiated at this convention the plan of holding an exhibit, which was so successful that it will be continued. The exhibits were arranged around the walls of the Drill Hall and in a double row down the center.

In the space available here it is impracticable to go into detail regarding the exhibits. Some of the new things shown will be described in later issues of this paper.

It was fortunate for this first exhibit that the use of the Drill Hall involved no rental cost, so that there was no charge to exhibitors for space. The hall was divided off by light railings, constructed and painted by employees of the transportation department of the railway. It was hung with flags, many loaned by governmental departments, others rented.

While the exhibits this year numbered only about thirty-five, they were well worked out to show the latest developments in track, overhead, motors, control, car details, metering, etc. They fitted in well with the points covered in the technical discussion. Exhibitors said that the railway men studied the exhibit details in a gratifying manner. The associate members showed their appreciation of the work of R. M. Reade, Don M. Campbell, A. Gaboury and Peter J. Quinn, who composed the exhibit committee by the adoption of resolutions and the presentation of gifts to the local men who had stood the brunt of the work.

A part of the exhibit feature which occurred in the convention hall was the presentation of motion pictures by the Canadian National Safety League, the Canadian Westinghouse Company, the Shawinigan Power Company and the Association of Manufacturers of Chilled Car Wheels (which has been mentioned earlier).

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Social Features of the Convention

THE attendants at the convention were given many excellent illustrations of Canadian hospitality. On Thursday a get-together luncheon at the Chateau Frontenac served to break the ice. This was followed by a sight-seeing tour of Quebec for the ladies, and afternoon tea at the Drill Hall, There was also a rousing banquet in the evening, followed by dancing.

The dinner was the occasion of many felicitations, being unique in the attendance of President R. I. Todd and Executive Secretary J. W. Welsh of the American Association, President L. H. Palmer, of the Transportation and Traffic Association, President F. E. Webster of the Accountants' Association, President C. S. Kimball of the Engineering Association, Charles L. Henry, and other guests from the United States. Following the English practice, the toast list opened with one to the King, and this was followed by toasts to the guests, the ladies, the association and the press. The hits of the evening were made by Charles L. Henry, Chief of Police Emilio Trudel of Quebec and Acton Burrows. Brief talks were made also by Col. J. E. Hutcheson, Major F. D. Burpee, R. I. Todd, J. W. Welsh, F. J. Neil, Charles L. Wilson, G. Gordon Gale, Don M. Campbell, Frank Carrel, editor of the *Daily Telegraph*, Quebec; Col. George C. Royce and H. H. Norris.

On Friday afternoon a boat trip was taken to the famous Quebec Bridge, with music and refreshments on board, followed in the evening by a reception and ball at the Chateau. On Saturday morning special cars took the ladies to Montmorency Falls and the Shrine of St. Anne de Beaupré. For all of the occasions requiring music this was furnished by the Royal Canadian Artillery Band, from the Citadel, under the direction of Capt. Charles O'Neill.

Electric Resistance Welded Rail Joints*

New Butt Weld Proves Successful in Philadelphia, Boston and Elsewhere—Bar-Weld Joints Now Number More than 800,000

By E. B. ENTWISLE
Chief Engineer Lorain Steel Company, Johnstown, Pa.

WHEN girder rails were introduced in the United States in 1884 there was also introduced the problem of joints. It required a dozen years of use of this rail to prove that its life depended not so much upon the chemical proportions of the steel or the quality of its supporting ballast, as it did upon the character of the joints.

This paper deals with the type of joint known as the electric resistance joint of the Lorain Steel Company, the successor of the Johnson Company of Pennsylvania.

More than 800,000 Bar-Weld Joints Installed

This form of welding first took shape about 1894 and was designed to unite two rails with a bar 7 in. long on each side of the web, with contact against the web at the extremities of the bar. The current was passed through these contacts which were welded to the web. The first of this type of welding was done in Boston on what was known as the Providence rail, the joint then in use being a casting which received the foot of the rail, with a wedge driven along one side to hold the rail and casting together. Later and more successful designs of electrically welded splice bars replaced the first type, and with few alterations have been the standard for twenty-five years.

The bar-welding with head support, if done on new rail with no splice bar holes, is 18 to 22 in. long, 3¼ in. wide and 1½ in. thick, of mild steel. On old rail the bars are long enough to extend beyond the old bar holes. To prepare the bars for welding they are heated and placed under a drop hammer which forces a pear-shaped portion of the metal above the surface of the bar at each end and a strip 1¼ in. wide across the bar in the middle. These three areas are the sections welded. A head support about 4 in. wide is welded to the bars at the time the middle weld is made. This is also welded to the side of the rail head, and to the web.

For twenty-five years this process has been carried on, until now there have been welded more than 800,000 joints distributed among the principal cities of the United States, and many repeat orders testify to the estimation of its value held by those who know it best. A repeat order for the fifteenth consecutive year of one of the largest traction companies has just been entered.

Bar-Weld Joints on the B. R. T.

The process has been successfully applied to open T-rail construction on the Myrtle Avenue line of the Brooklyn Elevated Railway. Here the track is exposed to rapid changes in temperature of the air, without the aid of the earth to absorb and dissipate the accumulated heat. An experimental installation of 370 joints was made in December, 1914, and January, 1915. A recent inspection of this track shows that four joints have been removed on account of breakage through the rail, one other showing fracture through the welded bar, and eight other joints were slightly defective due apparently to failure to fill up the openings between rails with shims when the weld was made. This installation after seven and one-half years of service is still carrying the traffic with a minimum maintenance cost as to joints.

Joint failures can be accounted for on the hypothesis of power shortage during the moment of welding, or overheating, or imperfect alignment and surfacing of the rail prior to welding, or contraction of the rail localizing at the joint.

A few examples of percentages of failures will serve to show the value of this form of joint as a maintenance proposition. An installation of 1943 joints in 1917-1918 on 7-in. new girder rail had five breaks. A later installation of 3,833 in 1919 to 1921 has no breaks to date. This is a record of one-tenth of 1 per cent.

Six miles of 56-lb. T-rail track laid in macadam with one rail uncovered to the ties was welded ten years ago and an inspection this month reveals no broken joints.

Another large installation covering about seventeen years, for the Public Service Railway of New Jersey, required 130,158 joints. There have been welded in Chicago since 1907 a total of 184,423 joints on the standard Chicago rail, which weighs 129 lb. per yard and is 9 in. high. In these joints the percentage of breaks during the first six years was 2.74, and the average for nine years was below 1.5 per cent. This improvement, to quote from the report of the board of supervising engineers, Chicago Traction, was brought about "by the combined efforts in improving the workmanship of the weld and by the more uniform conditions of power supply which became available as the work proceeded."

Latest Development Is the Butt Weld

The Lorain Company is now operating under the Jacobs patents on a butt weld. This process contemplates bringing the milled ends of the rails together and welding them without the aid of bars. This was the process aimed at by the predecessors of the company back in 1893-1894, but their engineers were unsuccessful in achieving what apparently today is the 100 per cent joint.

The butt-weld process consists essentially in a method of heating the end, or abutting surfaces of the rails to be joined, by having them in contact with a liquid flux which is heated to a high degree by the passage of a comparatively small electric current through it, and a powerful clamp against the rails, operated by a hydraulic pump, for forcing the rails together, end to end, after the ends have been brought to a welding heat. The apparatus is mounted on two trolley cars, the first of which contains a 30-kw. motor-driven alternating-current generator, an air compressor, a furnace for melting the flux and a reheating torch. A switchboard with all necessary meters and regulating apparatus is also provided.

In the process the rails are spiked to a few ties to hold them to gage and to insure a fair surface and alignment, and an opening of about ½ in. between the ends. The rail clamp and crosshead are then adjusted so as auto-

*Abstract of paper read at the annual convention of the Canadian Electric Railway Association, Quebec, June 1 to 3, 1922.

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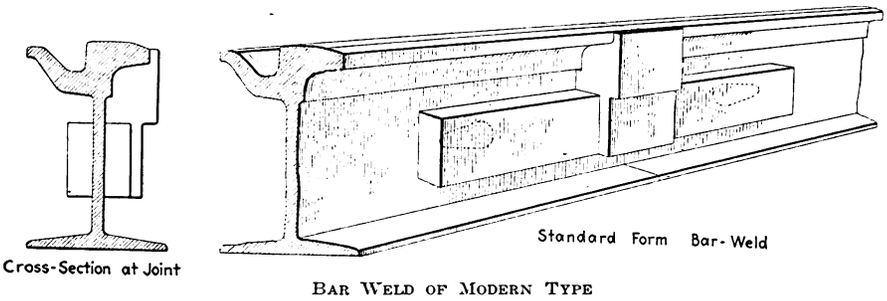

BAR WELD OF MODERN TYPE

matically to bring the two rails in line with each other. A spacer is set between the rail ends and a preliminary pressure of 5,000 lb. per square inch is applied before the molds are set in place. When the molds are set the cable terminals from the generator are clamped to the crossheads and the current is passed through the flux, which has previously been melted and poured into the mold. The current in its passage through the flux heats the ends of the rails to a high degree above the welding heat of steel, and when this point is reached, which requires about three and one-half minutes, the pressure is applied, the rails are forced together and simultaneously the current is cut off. At about a half minute before a welding heat is reached, the current reaches its maximum when about 1,650 amp. is taken at about 40 volts. No oxidation in the weld is possible, as the rail ends are completely immersed in the flux and no air can reach them.

Immediately upon the application of full pressure the top mold is taken off and the hot metal which has extruded at the weld is hammered across the head, thus producing a forging effect to obviate any tendency that might exist to soften the rail at the exact point of weld.

Scleroscope tests show that the portion which has been heated and hammered is actually somewhat denser than the parts of the rail that have not been heated. The pressure holding the rails together is maintained until the weld has cooled below its critical temperature, when the reheating torches are applied and the flame is directed to the center of the web, directly against the weld, and it is reheated to about 1,500 deg. F. This relieves any strains that may have been set up due to the end pressure or other causes.

About § in. of each rail is combined in the weld, the extruded metal being ground off the head and tram. As a continuous operation about three welds an hour can be made on 9-in. rail.

The first experimental butt welds were made in Pittsburgh, Pa., in December, 1919, and in Johnstown in the summer of 1921 on the tracks of the Johnstown Traction Company. Ninety-three welds on 134-lb. 9-in. girder rail were made, making two rails each 2,700 ft. long. About one-half of this track was sprung into a curve and was not paved in for several weeks. Yet there was no distortion under constant operation, and no breaks have occurred.

In Boston, 504 welds were made in 1921 on four different rail sections. In Philadelphia 402 welds on 9-in., 141-lb. rail were made within the last year. In this process, due to the single track operation in that city, the welding apparatus was set on a motor truck, the rails being laid on top of the paving outside of the track, which was being operated over by the railway, and sections from 1,000 to 1,500 ft. long were welded, and were afterward set over into the track in their permanent position.

The advantage of the process is due to the fact that the entire cross-section of the rail is welded, without the addition of any other metal. While special conditions require special treatment, there are no difficulties which cannot be overcome, and they are more than compensated for by the permanency of the result. There has been but one failure in more than 500 joints welded in Boston, five joints in more than 400 welded in Philadelphia, and none in Johnstown where ninety-three joints were welded.

Electric Railway Credit Returning*

BY JOHN A. PRESCOTT

Prescott & Snider, Kansas City, and
Vice-President Investment Bankers' Association of America

THE financial results of operations of the electric light, power, gas and electric railway companies for the calendar year of 1921 generally indicate a marked improvement in credit and again prove the inherent stability of the utility business as a whole during a period of serious business depression.

There also is marked improvement in the actual appreciation in the market values generally of both senior and junior securities of utility companies.

Companies enjoying good credit are now able to sell senior securities at rates of interest much lower than during the previous year. In fact, the cost of such financing to those companies which have the highest credit is already at a point where such companies can afford to consider making important extensions. The other important determining factors naturally are reasonableness of the construction costs and the probability of being able to provide for a part of such costs through sale of junior securities, as well as from undistributed earnings.

To a limited extent, we are now witnessing junior financing, particularly in localities where public understanding has resulted in relief from inequitable burdens and the granting of rates adequate to assure a stable interest return and steady dividends based on proper property values.

Vast sums of new capital are needed by all utilities. The amount required for electric railways and the electric light and power properties alone had been estimated at $1,000,000,000 per annum for the next five years to be used in replacements, refunding obligations, extensions and improvements. This is indicative of the similar needs of all, merely to care for postponed construction and to keep pace with community growth.

This financial problem is made more difficult by the present system of federal and state taxation. The large investor, who in the past was chiefly called upon to furnish funds for the industry, cannot now afford to buy taxable securities. The industry must, therefore, find new sources of capital among investors whose contributions are so small as not to be seriously affected by federal or local taxation of their securities.

It is urged that investment bankers devote more attention to the development of markets, particularly for junior securities, in the communities served, not only to make available this additional source of capital, but also because the benefits derived therefrom, in the solution of many of the serious problems affecting the industry, can hardly be overstated.

While considerable progress has been made in restoration of the credit of the power and light companies particularly, the process of readjustment has been somewhat slower in the gas and electric railway industries because of the greater difficulties which these industries have in readjusting rates, service and operating costs. The recent experiences in Des Moines, Iowa, and Saginaw, Michigan, and other places have demonstrated that the use of the jitney, the automobile bus and the trackless trolley never can replace electric railways. These vehicles are being recognized as useful accessories to existing electric railway transportation systems, but no more than that. Furthermore, it should be understood that managements of companies engaged in supplying an electric railway service are experts in urban transportation and as such will naturally adopt improvements as experience and the requirements of the service dictate.

We wish to call particular attention to those facts as indicating the fundamental soundness of the electric railway business. It is as essential as light and power services, and in the interests of the public welfare, must be assured as sound a financial basis as they.

*Abstract of interim report of the committee on public service securities of the Investment Bankers' Association of America, dated May 4, 1922.

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In this connection attention is directed to what appears to this committee as an unfortunate and perhaps an invidious comparison frequently used by investment bankers in making offerings of securities. Stress is often laid upon the small percentage of revenue derived by a corporation from transportation service. The natural inferences from such arguments are likely to react unfortunately and retard the full restoration of credit of the public utility companies as a whole, because, after all, they are all based upon the same fundamental principles, to wit: the rendering of essential services at reasonable costs upon the assurance that investors will receive a fair return on honest investment value in the business.

In this same connection, we recommend great care in the preparation of offering circulars by investment bankers, to make the statements of financial facts and conditions so complete and clear as to enable both dealers and investors to analyze correctly and easily the securities offered. Perhaps a real service might also be rendered by encouraging the publishers of statistical and rating manuals to exercise greater care in making the information they contain complete, comprehensive and accurate.

Examination of the statements of many public utility companies will disclose a startling increase in the proportion of net income paid out for taxes. The ability of a public utility to render satisfactory service is of paramount interest to its public and much more important to the community it serves than any revenue which may be derived from burdening it heavily with taxation. On the other hand, the margin of safety for capital invested in an enterprise is greatly reduced by excessive direct and indirect taxation, and must inevitably be paid for in increased rates.

Furthermore, there are many cases of gross injustice. We cite only one, merely to illustrate. Counties and road districts are freely issuing tax-exempt bonds to build hard-surfaced roads to parallel long existing steam and interurban electric roads rendering good and essential service. These parallel, hard-surfaced roads are certainly of no benefit to the utilities. They are worn out by competing freight trucks and bus lines which usually contribute practically nothing to their construction or upkeep. But the utilities not only are invariably taxed to the limit to pay for the construction and maintenance of these competing roads, but are further penalized by reason of their taxable securities having to compete in the investment markets with the tax-exempt municipal road bonds.

Since, in theory, taxes are paid for protection and benefits, there is a peculiar irony in compelling the heavily taxed and strictly regulated public utilities to furnish the fundamental facilities to their practically tax-free and unregulated competitors. If the public thinks its interests require this sort of competition, we believe it should at least rectify this gross injustice by requiring these competing, and usually irresponsible, free lances to secure certificates of public necessity, take over from the public utility companies all the tax burdens now borne by them for the construction and maintenance of hard-surfaced roads, and submit to as strict regulation and requirements of responsibility for the public safety as are now imposed upon the utilities.

It must be evident to students of taxation that public utilities, whose opportunities for profits are reduced by public regulation to practically an interest basis, the quality of whose services and the range of whose activities are closely supervised and circumscribed, cannot be equitably taxed upon the same basis as industries or properties whose opportunities for profit are legally unlimited.

In view of the fact that some of the states are about to hold constitutional conventions for the purpose of drafting new state constitutions, it is particularly timely and opportune for investment bankers and operators of public utility properties to discuss the fundamental questions affecting the taxation of both public utility properties and securities. Inasmuch as the constitutions of most states provide for the equal taxation of all classes of property, both real and personal, upon the same basis of valuation and levy, in order to provide equitable forms of taxation applicable to different forms of property, it is necessary to lay a proper foundation in new constitutional provisions.

It would seem, therefore, a wise policy for our association at this time to propose and urge the incorporation in state constitutions of provisions for the classification of property for purposes of taxation, so that each class may be dealt with differently and equitably, and also in such manner as to produce for the governmental authority the greatest returns and benefits economically consistent. Such constitutional provisions would serve as foundations for sound systems of state and local taxation, affecting both public utility properties and the securities issued by the companies owning them.

Distance Fare Is Logical Railway Rate*

Readiness-to-Serve Charge Is Desirable but Difficult to Apply—Flat Fare Has Worked Hardship on Public as Well as Railways

By Henry L. Doherty

WHEN I look back on the public utility business I wonder that it has not had more trouble than has ever come to it. The basic economic problems which underlie nearly every form of public service have never been understood by a large portion of the public utility operators and have been totally disregarded by most all of them, even though they have been understood.

We must recognize that we are giving a service and not simply selling a commodity; that equity of charging is more important than simplicity of charging, and that methods of charging which can only be justified on the grounds of simplicity can be economically so unsound as at least seriously to handicap the business if not ruin it.

The expenses of being ready to give service are always present, although in some lines of business, like the street railway business, it may be hard to charge on a readiness-to-serve basis. Giving service here consists of having a car come down the street every five, eight, ten or twelve minutes, whether anybody is there to ride or not. If we were simply to run all cars carrying no passengers whatever, our expenses would probably be 80 per cent of what they are when carrying passengers. So, in a way, 80 per cent of all the expenses of a street railway are readiness-to-serve expenses and 20 per cent represents the actual cost of carrying passengers.

How to apportion these readiness-to-serve expenses among those who are benefited is a difficult matter, although there are ways by which regular and frequent riders can be premiumized. Some of the railroads are using an identification card which gives the holder a lower rate than the prevailing rate of fare, charging a fixed amount per month for the card. This gives a fixed charge plus a low rate of fare.

Passenger transportation is a necessary part of our city life. It could even be argued that it is a common expense which all property owners should bear. I have suggested on one or two occasions that it would not be inconsistent for the public to pay a part or even the entire readiness-to-serve expenses of a street railway company, raising such a fund by a property tax. An example which illustrates the justice of this is the gentleman who lives outside of a city and uses his own automobile exclusively. Nevertheless, much of what is necessary to maintain his home depends upon street railway service, not simply the errand boy and house servant, but many other things as well.

I have always been an advocate of a distance system of charging with a fixed loading and unloading charge; that is, a small charge to represent loading and unloading with a fixed charge per unit of distance of riding. I have always been told that such a system was impractical, but I see no reason to think that it could not be worked out in a very satisfactory way except for lack of interest on the part of street railway men. The flat 5-cent fare, to my mind, has worked a harm

*Abstract of address before annual dinner of the Connecticut Section, A. I. E. E., New Haven, May 23, 1922.

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that not only applies to the street railway companies but to the public as well. The meager transportation facilities in many of the European cities, which, however, seem adequate, can only be explained by the fact that anything in the nature of a distance system of charging tends enormously to increase the capacity of the transportation vehicles by encouraging short rides, and this in spite of the fact that many of the European zone systems are hopelessly faulty.

The proper system of distance charging would tend to keep the workman who is employed in the suburb living in that same suburb instead of having him perhaps cross the entire city to reach a district settled by his own type of people. It would also cause people to do more of their shopping in their immediate neighborhood and would give us the very desirable thing in civic life of less congestion and yet less transportation demand.

THE PAST POLICY IN REGULATION TREND

It has been only a few years since public utilities were indiscriminately subjected to competition. After many decades the public concluded that it was a sufferer by this competition and then solemnly resolved that best service and lowest rates could be had by the public by doing away with competition. The public said: "By natural law you should be a monopoly and we are going to make you one in fact, but if we do this we must regulate your earnings." We accepted this because there was nothing else we could do, and the fashion swept across the country of passing regulatory bills and creating public service commissions. And yet this work was hardly under way before the street railways were subjected to the most unfair sort of competition. Along comes the jitney and the public forgets all about the fact that we have had all profits above a nominal rate taken away from us for a period of years on the theory that being a monopoly we were not entitled to any more than a meager rate of return.

So we are again drawn into competition, and yet our competitor bears none of the expenses of being ready to serve the public. Our competitor simply carries passengers when it pays to do so. The taxpayer provides his road and cleans his streets and yet he takes enough of the cream off our business perhaps to make the whole undertaking unprofitable. The lesson once learned by the public has soon been forgotten. We have paid the price for immunity from competition only to find that we did not have even a sound crutch.

Then again the public has always been imbued with the idea that when we are allowed to earn a certain rate of return, that that is equivalent to being guaranteed that rate of return. This is one of the exceedingly unfair features of regulation as now practiced, because we are guaranteed nothing except that excess profits will be taken from us and that we will be left to bear our losses alone. In most cases excess profits, instead of being reduced by lowering rates, should be used to reduce the relation of capital to property value, perhaps even to the extent of bringing the capital down to the junk value of the property.

One thing we do need in the public utility business, no matter to which branch it relates, is an empowering act enabling the public service commission to fix an initial rate for a long period in advance, and then permit the company to earn all it can over what is now considered a reasonable rate of return, with the provision that these earnings shall be divided between it and its patrons. This is done in a measure by the South Metropolitan Gas Company of London and is known as the London sliding scale. It was initiated, I think, by Sir George Livesey. But in my opinion, the profit sharing with the patrons, wherever possible, should be done as a declaration in dividends rather than by lowering rates from time to time.

Pennsylvanians Discuss Competition

Association in Twenty-first Annual Meeting Devotes Main Consideration to the Problem of the Bus—Commission Chairman Tells Railways They Must Use Buses—Light-Weight Cars for City and Interurban Service Also Treated

W. D. B. AINEY, chairman Public Service Commission of Pennsylvania, told the men gathered at the banquet of the Pennsylvania Street Railway Association, Harrisburg, Pa., on the evening of June 1 that the problem of motor bus competition is very largely a matter that must be solved by the railways themselves. They must understand that the coming of the bus will be a competitive service unless its coming is guided to make it a complementary and supplementary service to the existing rail systems. If the railway men do not measure up to this aspect of the situation and do not give the public the bus service that is wanted, then neither legislature nor commission can save the railways from the new competitor. He considered that the bus in some respects represents an advance in the transportation art. It is something that the people want, and hence it is bound rapidly to find a field of service. Of course, he said, the bus must pay its just share of the cost of constructing and maintaining the roads used, for it is manifestly unfair for the railways, as very large taxpayers, to bear these burdens for their competitors. He emphasized the need for giving consideration to the human element in the transportation business —the business of meeting the wishes of the riding public. He said that in the main Pennsylvania companies have caught the key to the human element, with the result that they are enjoying fairly good public relations.

In his address to the association at the morning session on June 1. President T. B. Donnelly, West Pennsylvania Railways, also dwelt upon the competitive situation. He said that the automobile industry in its diversified use of materials has a strong commercial position. Through its various organizations it has been able to dominate in large measure the terms and conditions of automobile operation, such as the licensing provisions, the size and weight of trucks allowed, immunity from just and reasonable taxation, etc. Pennsylvania now permits the operation of a 13-ton truck on the highways, which is often followed by a trailer nearly as heavy. New York State is more liberal, and of course many of the trucks from that State are going over the Pennsylvania roads. He said he doubted whether there is any road now being constructed that will successfully carry this heavy traffic authorized for the fifteen or twenty years, representing the term of the bonds sold to build the road.

The question of adequate taxation is an important one. An irresponsible person may ask for and be granted a certificate of convenience and all he is required to pay is his license fee and income tax. The incorporated utility, on the other hand, must pay 5 mills on the value of its capital stock, 4 mills on its bonded indebtedness, a varying poll tax, municipal taxes and paving taxes. In connection with interurban bus traffic, a beneficent highway department often clears off the snow for long stretches, adding to the burden of the railway companies by so doing.

Mr. Donnelly said that certainly it is true as never before that the utilities should have a strong organization. They have been long content to take a defensive attitude, but they are now confronted with the organization activities of other industries, whose methods and plans are at variance with the best interests of the electric railways, though meaning to do no more than to get the best they can for themselves. He urged the association to be aggressive to the extent at least of submitting to these other interests some of the railway company problems, and then, in the interest of fair play and the general public good, to seek such compromises as may be possible.

C. L. S. Tingley, American Railways, pointed out that a broader point of view is needed in dealing with the motor bus. It will be impossible to stand in the way of anything which represents real progress. If the bus is economically sound and will provide a cheaper form of transportation than is now available it is going to come in spite of any opposition. The problem of the railways now is to demonstrate that the bus does not provide a cheaper means of transportation than the railways.

He spoke of an $8,000,000 bond issue

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for roads which had been built and had disappeared long before the bond issue had been retired. This is a common occurrence and it goes to emphasize the justice of the automotive common carriers using the highways bearing a just proportion of the cost of building and maintaining them. That they must do this is inevitable.

Mr. Tingley said that his company had filed application for a certificate to operate a bus line and was negotiating for the purchase of buses, which service would supplement the street car service now being given. He thought that this was a step which should be taken by all railway companies wherever a territory exists which justifies the installation of some service, but where the traffic available is not sufficient to warrant the construction of railways. He thought it to be almost a certainty that the tendency will be for Public Service Commissions to recognize the responsible railway company as against an independent operator when both are making application for the same bus route.

David I. McCahill, president Pittsburgh, Harmony, Butler & New Castle Railway, told the convention that application had been made in his name for a bus and truck line to serve as a feeder to the railway. He considered that this was one of the short cuts in solving the problem of automotive competition.

H. L. Mitchell, vice-president West Penn Railways, told of an instance in 1920 where among forty-eight applicants for certificates to operate bus lines it was found that sixteen were equipped with stolen cars and another man was a criminal that had been traced through several states.

C. B. Fairchild, executive assistant Philadelphia Rapid Transit Company, said that his company has considered the advisability of beginning the operation of buses in certain locations, but had found that it would be necessary to take out a separate charter in order to do this under the laws of Pennsylvania. This necessity was borne out by other members. Mr. Fairchild advocated that the bus situation be treated first by active effort to bring about proper restriction of bus operation and, second, by the railway companies getting into the bus business themselves.

Another delegate took issue with the suggestions made to endeavor to get taxation and regulation placed on the buses, as it was inconsistent with the idea of the railway companies going into the bus business themselves. He advocated that efforts might better be made to get relief for the railway companies from some of their burdens, rather than to bring additional burdens to the other fellow. It was expressed by several that there is a hopeful indication that the State Legislature will take some action at its next session to make the buses carry a fair share of the cost of roads.

John A. Dewhurst, Day & Zimmermann, spoke of the experience of the railway company at Oil City, Pa., in operating a bus line from the end of its railway to a neighboring city, Franklin, over a concrete road. After six or seven months operation, this bus line began to make a small profit, after charging off all operating expenses, interest and depreciation on the basis of a life of 150,000 miles. Including all these things, the total expense has amounted to 23 cents per bus-mile.

Mr. McCahill raised a pertinent question when he propounded to the members whether the railway companies should not seriously consider the establishment of some form of pick-up and delivery service for operation in conjunction with the railway. He cited an instance where in a hearing before a commission a group of shippers had strongly maintained that the trucking company which the railway was opposing should be permitted to continue operation as it provided a pick-up and delivery service which the railway company did not. This case is not yet decided.

Mr. Reily, Chester, Pa., told of an extensive investigation he had made as to the financial showing of bus companies. In general he had found that the results being obtained by many of the independent operators were very satisfactory indeed, some earning as high as $36 a day. Mr. Tingley mentioned a company operating over the Lancaster Pike that earned last year 38 per cent on its investments, and another line out of Philadelphia which made $4,000 surplus in addition to operating expenses and depreciation.

As a part of the afternoon program D. C. Ainey, mechanical engineer, of Harrisburg, Pa., read a paper in which he discussed some of the intangible elements of value in power houses. W. J. Clardy, Westinghouse Electric & Manufacturing Company, read a paper on "Double-Truck Safety Cars," in which he reviewed the features of the double-truck safety car developed by the Chicago Surface Lines, the Syracuse turnstile cars, the Lexington and other light-weight one-man interurban cars, etc. He then made some comment as to the relative merits of these various designs. He said that when comparing the double-truck safety car developed in Chicago with the standard safety car it is evident that the loading and unloading facilities of the former must excel the latter to compensate for the difference in capacity. The use of the separate entrance and exit is an improvement in this respect, but it is difficult to maintain two lines of passengers moving through the car even with the wide aisle.

Referring to the turnstile cars, Mr. Clardy said that the cars in service in Syracuse afford exceptionally good loading and unloading facilities as passengers are entering and leaving at opposite ends of the car. This feature eliminates interference and provides a means of handling traffic with a car operated by one man. The turnstile seems to operate satisfactorily, but the space required for its installation is a disadvantage. This is especially true on a car that is arranged for double-end operation. A recent development which is intended to eliminate this objection is a reversible one-way gate. This gate functions as well as the turnstile and accomplishes the same result with practically no more space requirements than a door. It is installed just within the door and is easily operated.

Continuing, Mr. Clardy said that the light-weight, one-man car for interurban service has proved very successful for certain applications and no doubt there are many places where such a car will meet the requirements satisfactorily. However, care should be taken not to apply a car of this type where it is too light to handle the traffic. Where the time between terminals is relatively short, say not over two hours, where the stops are frequent, that is, 1 or 2 miles apart, and when maximum running speeds of 35 m.p.h. are sufficient to maintain the schedule, a car weighing less than 30,000 lb. can perform the service. For longer runs and faster service heavier equipment is necessary, and in some cases must compete with that of steam roads.

One-man operation of interurban cars does not materially affect the schedule in service where the light cars can be used. Heavy loading is usually at terminals where there is a layover and it causes no delay. The saving due to one-man operation is less for interurban service than for city service, as the crew expense composes a smaller part of the operating costs. Platform labor cost tends to decrease as schedule speeds increase. However, he contended that the maximum saving of crew expense for interurban service will be realized where the traffic is suitable for the light-weight car, as the scheduled speeds are not high in this class of service.

He pointed out further that most of the double-truck safety cars that have been placed in service recently are equipped with four 25-hp. motors and do not weigh over 30,000 lb. when completely equipped. The 25-hp. motors should not be accepted as a universal application for this type of car. There will be instances where the service will require a larger equipment, particularly on interurban lines.

Considerable discussion followed Mr. Clardy's paper. Mr. Reily, Southern Pennsylvania Traction Company, spoke of a line known as the Delaware County Line, on which one-man operation had been substituted without any change in the arrangement or equipment of the cars except to install folding doors, fare boxes and use metal tickets. The line had been running with an operating ratio of about 102 per cent under two-man operation, but under one-man operation was making a little money. Strange to say, the number of accidents on the line had

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dropped off to almost none with but one man on a car, while with two men, accidents were not uncommon. President Donnelly commented that he had had the same experience as to accidents with one-man versus two-man operation.

W. H. Boyce, general manager Beaver Valley Traction Company, New Brighton, Pa., admonished the members not to order slat seats when buying safety cars. He had found from experience that the people really dislike these, and he considered the additional expense and weight involved in cushion seats to be well placed.

D. A. Tomlinson, Portland Cement Association, read a paper on June 2 on the recent developments in making concrete. This dealt with the technique of preparing materials and making up the aggregate to get the best results.

A very interesting paper by L. H. Palmer on bus operation by the Baltimore company, which was presented June 1, was printed in the June issue of BUS TRANSPORTATION. Besides Mr. Ainey, other speakers at the banquet were Judges Hardges and Wickersham and Mr. McCahill. Mr. McCahill referred to his experience in the last two years with having the employees of his company represented on the board of directors, three directors being elected by the employees. He said that in general the employees have selected good men, and while the Brotherhood of Locomotive Engineers had at first refused to have anything to do with the plan, it had later come in and became enthusiastic about the plan. A unique situation at present, he said, is that one of the directors elected is a member of the wage committee of the trainmen. The great advantage of the arrangement has been the opportunity afforded to "sell" the directors representing the men on any matter which the company had under consideration. These men were then instrumental, and very successful, in putting the idea over with the employees in general. Mr. McCahill made the statement that this state of understanding existing between the company and its employees is of the greatest importance in making the railroad pay. He pointed out that it is not hard for the management to understand the problems of the men and if the management can get the men to understand the problems of the railway there will not be much labor trouble.

NEW OFFICERS OF THE ASSOCIATION

The officers elected to conduct the affairs of the Pennsylvania Association during the ensuing year were:

President, C. B. Fairchild, Jr., executive assistant Philadelphia Rapid Transit Company; vice-president, F. R. Phillips, superintendent of equipment Pittsburgh Railways; secretary and treasurer, Henry M. Stine, Harrisburg.

The members of the executive committee are the officers and C. L. S. Tingley, Gordon Campbell, C. Fred Crane, Thomas Cooper and T. B. Donnelly.

American Association News

Executive Committee in Montreal

IN VIEW of the meeting of the Canadian Association in Quebec on June 1 to 3, the American Association executive committee met in Montreal on May 31. The principal discussion centered on the Chicago convention, particularly with regard to space rented on the pier. A base rate of 75 cents per square foot was finally fixed, although this is less than was estimated to be necessary to cover the cost. The association will pay any deficit that may accrue due to this action.

Among the items of business transacted the following are the most important:

1. Charles L. Henry reported regarding the Bacharach bill situation. He said that general sentiment seemed against the bill, but that a further hearing before the sub-committee of the House judiciary committee would be held on June 8.

2. For the committee on publicity, J. N. Shannahan said that the reaction to the financial statement issued by President Todd was excellent. Arrangements are being made for sub-committees to handle advance publicity for the convention in sections. The publication "Truth" is meeting a real need.

3. A committee on nominations was appointed. The personnel will be announced shortly.

4. A committee on motor vehicle regulatory laws was also appointed. It comprises C. D. Cass, chairman; Paul Shoup, A. W. Brady, C. D. Emmons and David Daly.

5. The report of the committee on exhibits was adopted with some revisions, mainly with respect to fixing the space rate as previously mentioned. The committee recommended as director of exhibits C. W. Kelly, who bears the same relation to the National Railway Appliance Association. He is familiar with the local situation as well as with this line of work generally. He will act as the association's agent, but applications for space and payments will be made directly to the association.

6. Selections of names of members of the convention entertainment committee were made, but cannot be announced until acceptances are in.

6. Reports were received on the membership campaign, for use in which a comprehensive booklet has been prepared; on relations with the National Industrial Conference Board, and on the meeting of the United States Chamber of Commerce. On the last-named subject Mr. Shannahan said that electric railway men do not, as they should, appreciate the importance of the work of the Chamber.

The Montreal meeting was attended by these members: R. I. Todd, J. N. Shannahan, J. W. Welsh, F. E. Webster, C. S. Kimball, L. H. Palmer, W. H. Sawyer, J. G. Barry, L. E. Gould, George H. Tontrup, Thomas Finigan, Charles L. Henry. T. A. Cross represented C. D. Emmons, and Labert St. Clair and H. H. Norris attended by invitation.

Most of the members and guests left by night boat or train for Quebec, where they took an active part in the Canadian Association convention.

Mr. Adams Heads Nominating Committee

PRESIDENT C. G. KIMBALL, of the Engineering Association, has appointed the following as a nominating committee: H. H. Adams, chairman; E. R. Hill, Sidney Withington, M. B. Rosevear and W. F. Graves. This committee will make recommendations, and secure the consent of nominees to serve, on or before July 1.

New York Electric Railway Association

THE fortieth annual meeting of the New York Electric Railway Association will be held at Hotel Champlain, Bluff Point, N. Y., on Saturday, June 24. A technical session will be held in the morning at which there will be the address of the president, reports of various committees, and the following papers for discussion:

"Tax and Paving Requirements Now Imposed on Street Railroads and the Resulting Unfairness and Discrimination," by Alfred T. Davison, general counsel Third Avenue Railway System, New York City.

"Service from the Commission's Point of View," by Gen. Lincoln C. Andrews, chief executive officer Transit Commission, New York City.

"The Personnel Factor in the Electric Railway Industry," by Clinton E. Morgan, general manager Brooklyn (N. Y.) City Railroad.

In the afternoon there will be a sweepstakes handicap golf tournament with a court golf tournament and clock golf. Handicaps for the sweepstakes tournament should be sent promptly to H. B. Weatherwax, Room 22, the D. & H. Building, Albany, N. Y. There will also be a baseball game and a ladies' bridge tournament. Later there will be water sports, consisting of canoe tilting, swimming and diving, for which prizes will be offered. The annual banquet will be held in the evening and will be followed by dancing.

For the convenience of the New York members, the transportation committee has arranged for two or three private sleepers to be attached to train No. 29, leaving Grand Central Terminal, June 23, at 8:00 p.m. (standard time) to go straight through to Bluff Point. Reservations for transportation should be made through C. H. Beck, Room 2101, 165 Broadway, New York, N. Y., and requests for hotel accommodations through James P. Greaves, 243 Fifth Avenue, New York.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Wage Reduction Demanded

President of Cincinnati Street Railway Insists Men Shall Accept Cut in Interest of Economy

Ten per cent reduction in wages and sweeping modification of many rules and working conditions have been demanded by the Cincinnati (Ohio) Traction Company of its 1,800 employees, the change to be effective from July 1.

As a basis for the wage reduction President Schoepf said that the cost of living has gone down and that there has been a reduction of wages in other industries. He said that under a service-at-cost franchise there is an obligation of the company and the men to the public.

The maximum wage now paid motormen and conductors is 50 cents an hour. The company requests the men to accept 45 cents. For the first three months of service they would receive 40 cents and for the next nine months 43 cents an hour. Thereafter the maximum rate would prevail. Other wage provisions in Mr. Schoepf's letter are:

Crews operating sand cars, special cars, sprinkling cars, coal cars and supply cars shall receive the regular rate of wages scale for conductors and motormen, ten hours to constitute a day's work. All platform work in all departments is to be performed by transportation men.

Electric shovel operators shall be paid 47 cents an hour, ten hours to constitute a day's work. The pay of carhouse men, members of the association, except car tenders and watchmen shall be decreased 10 cents from the present rates.

The company reserves the right to determine the number and class of men to be placed at each carhouse and these men shall not be discriminated against because of their being members of the association. In case of vacancies that may arise men are to be promoted from a lower to a higher rate of pay or from a night to a day shift, provided, in the opinion of the company, they are capable of filling the position paying a higher rate or the more desirable position. Ten hours shall constitute a day's work.

All men working day shifts shall complete their day's work by 6 p.m. each day.

Carhouse men shall perform such duties as shall be regularly assigned to them or do such other work as the company may prescribe when necessary to facilitate the work. Car tenders shall be paid at the rate of 29 cents an hour, ten hours to constitute a day's work, and they may be promoted to fill vacancies in carhouses provided in the opinion of the company they are capable of performing the higher class of work.

Watchmen shall be paid at the rate of 27 cents an hour, ten hours to constitute a day's work.

Incline gatemen, members of the association, shall be paid at the rate of 27 cents an hour. Curve cleaners shall be paid 29 cents an hour.

Modifications in the several sections of the agreement are: In section 8 providing that employees may be absent on union or company business without losing rank or position adds that there must be sufficient reason for such absence. There is a curtailment of the time allowed to make out accident reports.

In the section dealing with free transportation to employees in place of a book, it is provided that this transportation shall be in such form and subject to such regulations as may be prescribed by the company.

The use of one-man cars is foreshadowed in the change of the section covering the use of motormen as conductors and conductors as motormen by the addition of these words: "This section shall not apply to men that may be called upon to operate one-man cars should the company begin the operation thereof." There are provisions regarding sprinklers, trippers, the penalty for missing and for meal relief.

In the event the men do not accept the terms proposed President Schoepf suggested arbitration on the entire agreement from section 5 to section 33 inclusive. He said he has been kept from Cincinnati by illness, but on his return he will be pleased to meet representatives of the union.

The reply of the union follows in part:

In presenting this matter you stress the point that there has been a continued reduction in the cost of living since our last agreement was entered into. We cannot agree with you that this continued reduction in the cost of living is an actual fact; on the contrary, living costs according to the statistics of the United States Government have advanced in the last sixty days.

Last year we voluntarily accepted a wage reduction, at least as large as any other class of workmen in Cincinnati has been asked to accept, and we do not believe that you are justified in insisting upon this proposed reduction and these changes in our working conditions at this time.

We realize that the company and its employees jointly have a direct obligation to the people of the community, but we do not believe that the people of Cincinnati desire a lower fare when they know it will mean a lower standard of living for the men.

We regret that illness has prevented you from calling the officers of the association into conference to discuss the conditions of employment and we note your willingness to have such a conference on your return to your office and suggest that as the best course to pursue at this time. If, however, it is found at these conferences that there are questions upon which we cannot agree we will gladly accept your proposal for arbitration.

Brazil Gets $25,000,000 for Electrification Work

For electrifying the suburban division of the Central Railway of Brazil, owned and operated by the Brazilian government, the Republic of Brazil has negotiated in New York a $25,000,000 thirty-year 7 per cent gold bond issue. The Central Railway is the principal railway system of Brazil, operating approximately 1,563 miles of lines serving the important states of Rio de Janeiro, São Paulo and Minas Geraes. The bonds are direct obligations of the government of the United States of Brazil and are specifically secured by a first charge on the gross revenues of the Central Railway of Brazil. The bonds were offered for subscription on June 5 at 96½ and interest to net about 7.30 per cent by a syndicate of investment bankers and bond houses headed by Dillon, Read & Company, New York.

Findlay Decision Explained

Service-at-Cost Franchise Case to Be Appealed to Ohio Supreme Court for Settlement

It now appears that the action of the Third Ohio District Court of Appeals on May 22 in declaring illegal the year-old service-at-cost franchise of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, was done for no other reason than to force the issue to the Ohio Supreme Court for a decision.

The litigation started at Findlay in 1921 when an attorney named George Phelps filed suit to test the validity of the company's franchise of 1915 after it had been modified by the City Council. The Common Pleas Court ruled against Attorney Phelps, but he appealed the case to the Court of Appeals. The Court of Appeals reversed the decision of the lower court.

Between the years 1915 and 1921 the company operated in Findlay under a franchise granted early in 1915. The terms of this franchise were of such a nature that with the increasing cost of labor and material during that period the Findlay end of the operation was losing $30,000 a year.

At the close of 1920 the traction company applied to the Ohio State Public Utilities Commission for permission to abandon the Findlay operation. Legal representatives of the city, together with representatives of the Chamber of Commerce, were present at a hearing on the matter before the commission and made their appeal for the retention of the service so strong that the commission suggested the representatives of the various bodies confer with officials of the company with the view to helping relieve them of their burden. As a result the City Council of Findlay modified the 1915 franchise so as to enable the company to operate without a loss.

The modified franchise required the Mayor to recommend to the City Council six reputable citizens, three to be chosen to serve as a rate-making body. This was done and the result was that the fare was increased from 5 to 8 cents. The revenue from this charge was not enough to meet the operating expenses of the company and after three months time the fare was increased from 8 to 10 cents with seven tickets for 50 cents.

The 10-cent railway fare was in effect only a few weeks when Attorney Phelps filed his suit. It may be interesting to know that the Court of Appeals in handing down its decision in the matter was divided. Judge Philip Crow filed a dissenting opinion in the case.

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Accept Cut of Five Cents an Hour

The strike on the lines of the Maumee Valley Railway & Light Company, Toledo, Ohio, which became effective on June 1, was terminated on June 3, when the employees accepted a wage cut of 5 cents an hour. The men had been receiving 50 cents an hour for a nine-hour day, time and a half for overtime and a vacation without loss of pay. The company offered 45 cents an hour, straight time for overtime and abolition of vacations. The workers refused the pay cut and as a result interurban service stopped.

New Wage Scale in Effect

A reduction in wages effective June 1 for street car platform men has been made by the Pennsylvania-Ohio Electric Company and the Youngstown Municipal Railway, associate companies. The new scale of wages is 43 cents an hour for men in the service for less than three months, 46 cents an hour for men in the service more than three months but less than one year, 52 cents an hour for men in the service more than one year, 5 cents an hour additional for operators of one-man cars.

The scale which expired on May 31 was as follows: 48 cents an hour for men in the service less than three months, 51 cents an hour for men in the service more than three months and less than one year, 56 cents an hour for men in the service more than one year, 5 cents an hour additional for operators of one-man cars. The only change in working conditions is the removal of a restriction on one-man operation in Youngstown. This means that both companies hereafter may use one-man safety cars on all lines without restriction. The old agreement expired May 31, but negotiations were continued till the agreement was reached on June 5.

Public Opinion Expressed on Burdensome Paving

The committee of civic associations of Indianapolis, Ind., in a report recently submitted to the Mayor expressed itself in favor of relieving the street railway companies from paving requirements. The extract says that this practice of requiring the Indianapolis Street Railway to pay for paving over and along its right of way is one of the inheritances of the old mule car days, when the animals wore paths in the streets, and should have been discarded years ago. The committee emphasizes the injustice of this practice from the point of view of the car rider, who ultimately must pay. In part the report follows:

> The records show that $435,416 has been invested in new paving during the past twelve years, or an average of $36,395 per year. There appears to the committee no justice or equity in this practice. During the last two years the following sums were expended for maintenance: 1920, $111,724; 1921, 117,775, or a total of $229,499. The average for the two years was $114,750.
>
> If this item is eliminated from the operating expense accounts, the net revenue will be increased by a like amount. However, we are of the persuasion that after a reasonable period in which the company may be thus relieved that the Board of Public Works of the city of Indianapolis should be authorized and empowered to order the company to expend a like sum for extensions and improvements.

National Transportation Institute to Be Organized

To Help Co-ordinate the Activities of the Various Methods of Transportation and Disseminate Education on Transportation Principles

Organization in the near future of a National Transportation Institute is practically assured. While no date has been set for the organization meeting, it will be held before the end of the summer. Bird M. Robinson, the president of the American Short Line Railroad Association, and his associates, who are doing the active work of promotion, are engaged at present in lining up such support as will insure the new organization of representative backing. The organization of such a national association is being recommended by Representative Sidney Anderson and his associates on the joint commission of agricultural inquiry set up by Congress. Mr. Anderson, chairman of the commission, in discussing this recommendation said:

> There are approximately $50,000,000,000 invested in transportation in this country, including steam railways, electric railways, highways, automobiles, motor trucks, waterways and shipping. These agencies of transportation, which should function as a co-ordinated system in the aid of commerce, have come into existence without relationship to transportation facilities already existing. There is no agency through which the basis of fact and principle necessary for the co-ordination of these transportation facilities so as to give the most efficient service at the lowest cost, can be secured. There is no place today where the business of transportation can be learned except in the apprenticeship of the business itself. An institution such as the Commission suggests would furnish a means of definitely establishing the facts and principles of transportation upon which sound decisions respecting transportation policies can be predicated; the relationship of the different agencies of transportation to each other, and the relationship of these agencies to agriculture, industry, trade and commerce. It would also furnish a means for the dissemination of education in the principles, operation and practices incident to transportation.

Formal action indorsing the Institute already has been taken by the following organizations: American Farm Bureau Federation, National Agricultural Conference, American Lumber Congress, National Association of Manufacturers, Joint Commission on Agricultural Inquiry, and the American Short Line Railroad Association.

The Institute is to have its headquarters in Washington "under the supervision and control of men of preeminent ability, standing and learning, with reference to transportation," and will attempt to acquaint the public with:

1. The true fundamental principles underlying the various kinds of transportation facilities.
2. The facts as to the present conditions affecting transportation and the relative necessity and importance of each class of common carrier.
3. The real effect of each type of legislation and regulation.
4. How and to what extent, the public and the carriers will be benefitted, or affected adversely, by any policy or course of action that may be adopted in respect to their transportation problems?

Vote on Subway in Chicago Probable Next Fall

Voters of Chicago may have a chance to decide next November whether a subway system is to be built. The local transportation committee of the City Council on June 1 favored a referendum on the question after hearing from a committee of lawyers and engineers. Two propositions are to be considered, both contemplating subways in the central district only. The main dispute is whether the east and west subways should be made to connect with the river tunnels now used by the surface lines. This would save considerable money, but some of the Aldermen fear that this would complicate the city's position and possibly extend the franchise term of the surface line companies.

Civic organizations throughout the city have been agitating the subway question and there is considerable division of opinion, many being opposed to the expenditure of money from the traction fund for a downtown subway. The All-Chicago Council, representing ninety civic bodies, recently expressed disapproval of a municipally owned subway and objected to the use of the traction fund which has been contributed by the surface companies. It is expected that many of the Aldermen and delegates from civic organizations will take a trip through the East early in July to study subways.

Union Heads Liable for Strike Damage

Labor organizations are not exempt from prosecution under the Sherman anti-trust law. This, in effect, is the ruling the Supreme Court announced on June 5.

The court delivered such an opinion in the celebrated Coronado coal case. This is regarded as one of the most important pieces of labor litigation ever to come before the nation's highest tribunal. Chief Justice Taft delivered the opinion.

The court held that labor organizations can be held liable for property and other damages caused by the acts of members during strikes. The case was brought by the United Mine Workers of America against the Coronado and other coal companies, arising out of the Arkansas strikes of 1914.

Chief Justice Taft discussed at length the question of the liability of the national and international unions if the unions were responsible for what was done, pointing out that in common law unincorporated organizations could be sued as individuals, but from necessity of existing conditions it was utterly impossible of doing justice otherwise than by holding labor unions liable.

With regard to the United Mine Workers of America, the court found that the international organization and its officers did not order the strike or ratify it, and that they should not have been made parties to the suit.

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Financial and Corporate

Reorganization Plan Out

New Operating and Holding Companies Provided in Reorganization of Cleveland-Southwestern Line

A plan for reorganizing the Cleveland, Southwestern & Columbus Railway operating hundreds of miles of interurban trackage in Ohio, has just been sent to bondholders by Hayden, Miller & Company, Cleveland investment brokers. This company was forced into a receivership on Jan. 20 of this year. Since that time the road has been operated by F. H. Wilson, its president, as the receiver.

The plan for reorganizing the company provides for the formation of a new operating company to be known as the Cleveland, Southwestern Railway & Light Company, and also a holding company to be known as the Cleveland & Southwestern Company. This holding company would own and hold the entire common capital stock of the new operating company. Securities of the holding company will consist of, first, approximately $4,000,000 in 5 per cent cumulative preferred stock to replace the Cleveland, Southwestern & Columbus Railway Company's bonds for 1907, second, common stock no par value shares, the majority of which will be pro-rated and distributed to present preferred stockholders.

SUMMARY OF NEW SECURITIES

New securities as proposed to be issued will include:

1. An authorized issue of $1,500,000 in twenty-five-year sinking fund prior lien bonds bearing not more than 6½ per cent interest, $1,000,000 of the bonds to be issued at once to obtain funds to provide for essential improvements and as working capital, $500,000 to be held by the Union Trust Company as trustee for the purpose of providing sufficient funds to give the railway an approach and a connection with the proposed new Cleveland Union Station.
2. $1,500,000 in thirty-year 6 per cent extended bonds of four existing issues, these bonds being extended to 1952.
3. $3,700,000 authorized thirty-year first consolidated mortgage bonds of the Cleveland & Southwestern Railway Light Company to be used in replacing bonds held by the old company, adjusting accrued interest on other bonds and for the exchange of old bonds.

In their letter to the stockholders, Hayden, Miller & Company point out that when the old Cleveland, Southwestern & Columbus Railway was built in the early days of electric interurban railway service, its future seemed assured but that rapid development of Cleveland roads and the automobile have been prime factors in curtailing earnings. The result of this has been that for the last ten or fifteen years net earnings have not been sufficient to maintain the property adequately.

The statement of Hayden, Miller & Company shows surplus earnings of $15,129 and $90,217 in 1920 and 1919, and deficits of $64,818 in 1917; $57,569 in 1918 and $99,163 in 1921. The report further adds that because no depreciation has been charged off except on car equipment, additional depreciation charges of at least $50,000 a year should be made; that to avoid a complete breakdown, $600,000 should be expended at once on new power equipment and new rolling stock.

The formulators of the reorganization plan say that the improvements contemplated would save $100,000 a year in operating expenses, but that even then the company's earning capacity does not justify a funded debt of more than $5,000,000, although present bond issues aggregate $7,100,000. They add that the proposed plan will decrease operating expenses $100,000 a year, increase net revenues, cut annual fixed charges about $100,000, reduce the funded debt from $7,100,000 to about $4,700,000 and preserve the system as an operating entity.

Railway Issues Included in Bonds Called In

According to financial experts, easier money conditions are seen in the amount of bonds calling for payment in June of this year in advance of maturity. Among the important issues called during this month are 7½ per cent notes of the United Railways & Electric Company, Baltimore, Md. The company was expected to pay at 105 on June 1 $1,500,000 due January 1, 1930. The Detroit United Railway's $2,000,000 due 1923 was to have been paid on June 1 at 100½. Owing to the purchase of these lines by the city the company is able to pay off these bonds before maturity. Other railway issues calling for payment in advance of maturity dates are the Manchester Traction, Light & Power Company's 6's and the Ashland Light, Power & Street Railway Company's 7's.

Payment of Back Dividends Being Arranged

The West Penn Traction & Water Power Company, Pittsburgh, Pa., has declared the regular quarterly dividend of 1½ per cent on the preferred stock, payable on Aug. 15 to stock of record Aug. 1; also a dividend of 10¼ per cent to apply on accumulated preferred dividends, payable on Aug. 15 to stock of record Aug. 1. This dividend will be paid 1¼ per cent in cash and balance in 6 per cent interest bearing dividend warrants, in three installments, on Feb. 15, 1923, Aug. 15, 1923, and Feb. 15, 1924.

At a meeting of the directors it was voted to recommend to the stockholders that the company's name be changed to West Penn Company, final action to be taken at a stockholders' meeting on June 21. The company is a subsidiary of American Water Works & Electric Company, which holds 48 per cent of the preferred stock to which accumulated dividends apply.

Key Plan Modified

More than 80 per Cent of Bondholders Have Agreed to Reorganization—Slight Modification Proposed

After hearing the reports of subcommittees representing the various groups of security holders, the reorganization committee of the San Francisco-Oakland Terminal Railways, Oakland, Cal., has decided to modify some parts of the reorganization plan dated July 20, 1921. The plan as modified will be offered to the security holders and, if acceptable to them, will become operative at the expiration of thirty days after notice of modification under the terms of the original plan.

The following modifications have been adopted by the committee:

1. It was unanimously decided to eliminate the tidelands from the reorganization plan which originally contemplated retention of ownership of the tidelands by the new operating company.

2. The Halsey notes will be refunded by a subsidiary of the new operating company for the present principal of $2,500,000 in accordance with the conditions set forth in the original plan, except that the new issue will have a maturity of ten years instead of fifteen years and except for the elimination of a second lien on the tidelands from the security back of the Halsey obligation.

3. It was unanimously decided to modify the plan so that instead of one share of new common stock for two shares of old preferred stock, as provided originally, one share of new common stock will be issued for four shares of old preferred stock.

4. It is proposed to include in the plan a voting trust on such a basis as will legally place the voting power in the hands of a trustee of the stock (the stockholders themselves receiving trustee's certificates instead of actual stock) for seven years, with a board of directors of fifteen persons selected by the three several groups of security holders as follows:

(a) As representing the general mortgage bonds of the new company, four directors and the following are those selected for the first year: W. W. Garthwaite, C. O. G. Miller, P. E. Bowles and John S. Drum.

(b) As representing the "A" and "B" preferred stock of the new company, eight directors and the following are those selected for the first year: Warren Olney Jr., J. K. Moffitt, Robert G. Hooker, Samuel Knight, H. C. Capwell, B. H. Dibblee, Miles Standish and A. Crawford Greene.

(c) As representing the common stock or equity in the company, three directors and the following are those selected for the first year: W. I. Brobeck, W. R. Alberger and J. F. Carlston.

Inasmuch as $13,486,000 of the total outstanding issue of $16,401,000 bonds, or 82.22 per cent, have been deposited, it is believed that much more than a majority will agree to the present modifications. The security holders have thirty days within which to designate their approval.

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Interborough Hearing Concluded

Public hearings have been concluded before the New York Transit Commission on valuation of Interborough Rapid Transit property, made for the purpose of acquisition by the city for proposed plan of city-wide transit unification.

C. W. Kellogg, of Stone & Webster, defended the Interborough valuation estimates, despite attacks on their reliability by counsel of commission. He did admit, however, that Stone & Webster had made no original investigation as to material prices used in the estimate. The witness said also that determination of overhead by applying 22.2 per cent arbitrarily to total expenditures of $99,000,000 under subway contracts Nos. 1 and 2 was not sound engineering practice. According to Judge Shearn, counsel to commission, approximately $21,000,000 was improperly added to cost by this method.

Mr. Kellogg stated that errors in cost of steel and labor in company estimates did not affect totals sufficiently to warrant rejection. In regard to the opinion expressed in Interborough estimates, and approved by Stone & Webster, that commodity prices would in general be maintained, witness asserted that he was not in agreement with recent statement made by Coverdale & Kolptiz, engineers engaged in appraising Manhattan Railway property, that general trend of prices would be downward.

$103,594,395 Value Claimed

The Manhattan Railway, New York, N. Y., places the value of its property at $103,594,395, the New York Transit Commission was told at first hearing on elevated railroad valuation. This figure compares with $55,417,949 recommended by the commission's bureau of valuation, for the purpose of acquiring property in the name of the city, for inclusion in the commission's transit plan.

The basis of the company estimates is the cost to reproduce property today, while the value recommended by the commission is based on original cost less amount necessary to place the property in first-class operating condition. Only property useful for operation is considered in the commission's report and no account is taken of franchise or going value. The commission's estimate for cost to reproduce at 1921 price is $97,309,796, which includes an item of $9,913,422 for general expense.

The Manhattan value of $103,594,395 represents present estimated value of $81,504,534, plus $22,089,861 for general expense of administration, organization, engineering, etc. The company carries property on its books at $113,001,414, and has outstanding capital stock and bonds to the amount of $105,199,439.

The Transit Commission on June 6 continued its hearings on its valuation of the property of the Manhattan Railway. It was asserted that the Manhattan elevated system, leased by the Interborough Rapid Transit Company, would pay larger dividends if not burdened by the Interborough extensions.

George W. Burpee, expert for the Manhattan Railway, testified that 3.4 to 4 per cent could be earned by the company on the common stock for the fiscal year ending June 30, 1922, with the range increasing to from 7.1 to 8 8 per cent for 1926. These data were submitted in line with the Manhattan company's claim that its lines today, independent of the outlying extensions built by the Interborough Rapid Transit, and merged with the original system are worth more than $100,000,000.

$3,000,000 Milwaukee Issue Offered

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., placed on sale on June 1 its new issue of $3,000,000 of 7 per cent cumulative preferred stock. The issue is being offered locally to Milwaukee and Wisconsin investors at par for cash or on the partial payment plan. The plan to offer this issue has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

Cleveland Stock Selling at Par

For the first time since Jan. 2, 1920, stock of the Cleveland (Ohio) Railway went to par on June 2, 1922, one hundred shares changing hands at this figure. The stock has jumped fourteen points since the first of the year. It yields a 6 per cent return.

With the stock now selling at par, the company very likely will soon attempt to market new securities for the purpose of making betterments and extensions and adding to its rolling stock. No new stock has been sold for more than two years because a provision in the service-at-cost ordinance forbids the sale of new stock at a price under par.

Plan to Liquidate Deferred Dividends

Directors of the Appalachian Power Company, Princeton, W. Va., have submitted to their stockholders a plan to be acted upon at a special meeting, to be held on June 15, whereby the accumulated dividends on the preferred stock will be paid off, and the present preferred changed for a new senior issue on which the regular quarterly dividends of ¾ per cent are expected to begin in January of next year. The amount of accumulation at present is $70 a share.

The plan also provides for the issuance of 40,000 shares of preferred stock $100 par value, cumulative at 7 per cent after Oct. 1, 1922, of which 37,060 shares are to be exchanged for 21,800 shares of the present preferred with $70 accumulated dividends thereon, the exchange to be made at the rate of $1\frac{7}{10}$ shares of new stock for each share of the old with its accrued dividends.

In addition to initiating dividends on the preferred in January, 1923, the management expects to be able to show a substantial surplus for the common.

Included in the system of the company are 21.5 miles of electric railway.

Sanderson & Porter Will Direct New Brunswick Power Affairs

Sanderson & Porter, New York, N. Y., have taken over the direction of the affairs of the New Brunswick Power Company, St. John, N. B., from P. W. Thomson and his associates. M. A. Peeler has been appointed general manager of the company. He has recently been assistant general manager of the Potomac Public Service Corporation, Hagerstown, Md., formerly the Hagerstown & Frederick Railway.

There has been considerable speculation locally in St. John on the effect the change in management will have on the strike of employees of the company in operation for a year. As indicated in the ELECTRIC RAILWAY JOURNAL for June 3, the strike of the employees as a strike has long been over, but the baneful effect of the labor trouble still lingers.

Preceding Mr. Thomson as manager at St. John was T. H. McAuley, Calgary, Alberta, formerly manager of the Calgary Street Railway. Preceding Mr. McAuley was H. M. Hopper, formerly secretary-treasurer of the old St. John Street Railway, and now in the electrical supply business in St. John. Before that W. Z. Earle, C. E., was general manager for a short period.

The president of the New Brunswick Power Company is L. R. Ross, terminal agent of the Canadian National Railways at St. John. The company is owned by American and Canadian capitalists. Most of the bondholders are represented by banking concerns in New York, Boston and Providence. A representative from Providence has been in St. John for some time looking after the interests of the American security holders. There is only one general issue of bonds outstanding against the properties of the companies. The interest on this issue has always been met regularly.

There are two issues of preferred stock outstanding in addition to the common stock, and while on two occasions the dividends on these issues have been deferred, payment is understood to be behind on only one of these for a single period, and this is said to be a technical default rather than an actual default of payment.

The railway at St. John consists of twenty-five miles of track.

Increase in Capital Stock Proposed

The Honolulu Rapid Transit Company will increase its capital stock from $2,000,000 to $3,000,000, as was recently authorized by the stockholders' meeting, subject to the approval of the Public Utilities Commission of Hawaii. The additional stock will be held in the treasury and sold as occasion demands, for capital improvements. With the approval of the commission it is proposed to issue immediately $500,000 worth of stock to provide money for betterments, extensions and rerouting on several lines. The new stock will have a par value of $20 and has been placed on the local exchange.

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Traffic and Transportation

Jitneys Must Go

Detroit Rules Autos Off Main Traffic Thoroughfares—Oct. 1 Last Day for Pirates

All jitney licenses under the former ordinance in the city of Detroit expired on May 15. A new ordinance has been passed by the City Council. This measure increases the amount of the bond for drivers, requires a separate bond in each instance and eliminates jitney traffic entirely from Fort and John R. Streets, Michigan, Grand River, Woodward, Gratiot, Cass and Jefferson Avenues and the parks and boulevards.

In connection with a recent study of traffic congestion in the city of Detroit the Department of Police reported the number of street car passengers, automobile passengers, passengers in horse-drawn vehicles and pedestrians passing various important street intersections. In explaining that a partial solution of the difficulty due to accidents caused by automobiles could be overcome by more stringent regulations of jitneys, it is cited by Police Commissioner James W. Inches that with the return to normal industrial conditions the amount of traffic will be greatly increased and the problem of its regulation will become much greater.

Since the adoption of the jitney ordinance on June 9, 1921, approximately 2,300 jitneys have been licensed to operate in the city. In April about 1,674 jitneys were active. They ran for the most part upon Woodward Avenue, Jefferson Avenue, Grand River Avenue, Michigan Avenue and Fort Street, thoroughfares which radiate from the business center of the city, all of which are heavily congested.

While the ordinance was to take immediate effect on May 15, when all jitney licenses expired, officials of the jitney organization succeeded in having the enforcement of the ordinance postponed until Oct. 1, in order that some of the drivers who have purchased their cars on time may still operate. Licenses will not be renewed for next year, but the temporary licenses will permit drivers whose records are clear and who are dependent on the jitney business for a livilihood to run until Oct. 1.

Officials of the Detroit Department of Street Railways consider that the jitney as a factor in Detroit's transportation system is ended and that the people will go back to riding on the street cars and motor buses as there are now probably less than 500 jitneys operating in the city and some of the streets have already been cleared of the pirates.

It was reported that the jitneys collected fares that would have netted the Detroit United Railway $12,000 a day, prior to the taking over of the D. U. R. city system by the city street railway department.

While increased employment in local factories caused many operators to quit prior to the passing of the new ordinance, the Council's action is considered as sounding the end of the business.

Woodward Avenue, according to records in the police department, had the largest number of jitneys, 502 being operated over that avenue when the business was at its height.

There had already been four amendments to the original ordinance, but in view of the several additional amendments considered necessary by the police department, the new ordinance was prepared by the Corporation Counsel's office and approved by the Mayor.

Seven-Cent Fare in Chicago

Court Has Fixed New Rate—Probable Income Decrease $8,000,000—Company Insists Wages Be Reduced 20 Per Cent

THE rate of fare on the Chicago Surface Lines will be reduced from 8 to 7 cents on June 15. Tickets will be sold at the rate of three for 20 cents and children under twelve years may ride for three cents. These were the terms fixed by the United States District Court on June 1 as conditions under which a temporary injunction would be granted against the 6-cent fare order issued by the Illinois Commerce Commission on April 8.

Inasmuch as this cut in the rate of fare is expected to reduce the company's income about $8,000,000 annually, prompt steps were taken by the management to reduce expenses. President Henry A. Blair immediately served notice on the employees' organization that the company was ready to start at once on conferences with a view to changing the contract by which the men have been receiving a maximum rate of 80 cents an hour since June 1, 1920. This agreement calls for thirty days notice so that the new scale will become effective on July 2. Representatives of the employees talked strike as soon as rumors of a possible reduction in wages were circulated, but it is expected that arbitration will follow if an agreement cannot be reached by conference. The new rate of pay which has been suggested is 64 cents an hour, a 20 per cent reduction.

The decree of the Federal court was unusually brief. The case had been heard by Judges Evans, Page and Geiger, who entered a temporary restraining order some time ago to prevent the commission order from going into effect while the case was being considered. Judge Geiger did not agree with his associates. The order follows:

> Upon consideration of the issues presented in this cause, Judge Evans and Page are of the opinion that a temporary injunction should be granted as prayed for, but upon the terms and conditions following: That plaintiffs, beginning not later than June 15, 1922, shall charge not to exceed the following rates: For a continuous trip in one direction within the present limits of the city of Chicago over the street railway operated by the companies and on extensions thereof, whether owned, leased or operated by them, the sum of 7 cents for each passenger twelve years of age or over, and 3 cents for each passenger under twelve years of age; provided that the children under seven years of age, accompanied by a person paying fare, shall be permitted to ride free, and upon the further condition that for adult passengers three tickets shall be sold for 20 cents upon all cars. Transfers shall be issued good as heretofore. Judge Geiger is of the opinion that the application for an injunction should be denied. An order may be entered directing the issuance of an injunction as above specified.

One important question was left undecided. Under a former order of the Federal court, entered last November, transfers have been issued as rebate slips. It was contended when the original 5-cent fare order was issued by the commission that these slips might have a value of 3 cents each. When that order was annulled and a 6-cent order entered April 8 it was stated that the slips might be worth 2 cents each. Another theory is that those issued since May 1, when the 6-cent order was to have become effective, might be worth the difference between 7 and 8 cents. This point probably will be taken up by the city's lawyers for interpretation. It is not known how many transfers issued since the original order of the court have been saved by passengers.

Attorneys for both sides asserted that the Federal court had no power to fix rates, but they agreed that the court could prescribe conditions upon which an injunction would be granted. It is conceded that the companies have only the other alternative of submitting to the 6-cent order.

The 8-cent fare has been effective on the surface lines since July 1, 1920, previous experiments having been made with a 5, 6 and 7-cent rate. When the old commission went out of existence the city of Chicago took prompt steps to regain the 5-cent fare, and after a long hearing such an order was issued by the new commission last November. This was enjoined by three judges of the Federal court as being confiscatory. A similar showing was made as to the 6-cent rate, and the present order was the result.

Following the entry of the order, officials of the employees' union issued a statement in which they said:

> The city of Chicago has extracted from the railway approximately $40,000,000 since 1908 in what is known as the 55 per cent—also payment for power for operating bridges, cleaning, sweeping and repairing

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streets, that the street car men have been compelled to collect from the traveling public, the same being turned over to the city by the company, and we are satisfied that this great sum of money, which has been collected from the public, has been put to very little benefit to the public, if any. The company has also lent great sums over and above the operating expenses, and we believe the employees of the surface lines have earned large profit for the city of Chicago and the railway. Under these conditions we feel it is unjust to ask the men to take a reduction in wages at this time, when rents and taxes have increased to a point where they offset any reduction in other costs of living.

Literature and Exhibitions to Promote Safety

A series of short articles on various pertinent safety topics written by H. O. Allison, safety engineer of the Beaver Valley Traction Company, New Brighton, Pa., and first published as a daily first page feature by the Beaver Falls *Tribune*, has been published in a booklet for further use of the company in promoting safety work. This brings together in convenient form a booklet which is being used effectively in promoting safety work among the school children particularly, and among the citizens along the line of the Beaver Valley Traction Company in general. It undoubtedly would afford a number of suggestions for other railway companies in pursuing their safety work. A complimentary copy may be obtained from the company.

A mammoth rally and exhibition in the interests of "safety first" was recently given at Junction Park by the safety committee of the Beaver Valley Traction Company. The demonstration was attended by thousands of people and contained some attractive accident posters made by the school children of the county. Safety addresses were delivered by Judge Frank E. Reader and A. W. Robertson, president of the western Pennsylvania division of the National Safety Council. On the day of the rally a specially painted yellow car attracted considerable attention with its safety slogans, such as "Life Is Sweet—An Accident May Deprive You of It" and "Knowledge Plus Caution Equals Safety."

Interurban Fares Fixed by Court

Enforcement of traction company rates that provide no return on property investment is confiscatory and an invasion of constitutional rights, the United States Circuit Court of Appeals ruled on June 6. The decision granted the Augusta & Aiken Railway & Electric Corporation, operating in South Carolina and Georgia, the right to increase its rates over those fixed by the Railroad Commission of South Carolina.

The line between Augusta and Aiken is divided into eight zones, on which the fare prescribed was 5 cents for each zone or 40 cents between the cities. Under the ruling of the court just rendered the company is permitted to charge 8 cents a zone or 64 cents for the full trip, an increase of 24 cents over the old rate.

Variable Ticket Rate Suggested for Louisville

Conditions on which the Louisville (Ky.) Railway will consider a compromise with city officials on the 7-cent fare controversy have been announced by James P. Barnes, president.

The conditions named by President Barnes propose a continuation of the 7-cent cash fare, with 6¼ cents ticket fare. He would have the fares adjusted each six months or a year, based on the operation expense, so that investors will net a fair return on their money.

The company would be willing and ready to start the new fare schedule within a few months, Mr. Barnes said, adding that some very badly needed repairs must first be completed. Cash fares would continue at 7 cents, and tickets would be sold either four for a quarter or eight for half a dollar.

Improvements held necessary by President Barnes include the purchase of from seventy-five to one hundred new cars and the installation of new generating equipment at the company's High Street station in place of obsolete equipment in use at Campbell Street station.

Since the company won out before the United States Circuit Court of Appeals there has been talk of a compromise between the company and the city. Mr. Barnes and other company officials have conferred with Mayor Quin and Clayton B. Blakey, city attorney, regarding the next step to be taken to bring about a settlement of the controversy. The outstanding question to be decided if the negotiations are continued will be the amount to be allowed as a valuation figure on which to base the fare rate.

Plans for Altering Traffic Rules in Los Angeles

The Los Angeles Traffic Commission, which has for several months been conducting an investigation of traffic congestion in the downtown section of the city, has prepared a list of suggestions intended to improve conditions, continue parking downtown and also provide facilities for the delivery of merchandise to business houses. The last feature has been a most perplexing one, as trucks often are forced to park in the second line of traffic in order to deliver merchandise to downtown stores.

The executive committee of the commission, of which H. Z. Osborne, Jr., chief engineer of the Los Angeles Board of Public Utilities, is chairman, has adopted the following recommendations which will be forwarded to the City Council for consideration:

1. That during a given period of one or more hours in the early morning before the 45-minute parking law applies, no parking be permitted downtown except for loading and unloading purposes. This is expected to give room at the curb for delivery wagons.
2. That if the Council desires curb spaces be established in each block for the sole purpose of permitting vehicles to draw up there for two-minute periods for loading and unloading purposes.
3. That left-hand turns of vehicles be prohibited in the congested district of the city and left-hand turns of street cars be reduced to a minimum.
4. That no vehicles be permitted to turn in the middle of the block in the congested district.
5. That no vehicle be permitted to stop on street car tracks between street intersections for any purpose whatsoever.
6. That traffic officers at intersections give the right of way to a street car which is ready to move, except where automatic signals are in operation, in preference to vehicular traffic, because the street car handles from ten to twenty times as many persons as an automobile and because it cannot route itself to avoid congestion, as can other vehicles.
7. That no taxicabs, rent cars or sightseeing buses be permitted to stand on the street in the congested area while awaiting employment. This is the present regulation but it is not being rigidly enforced.

New Prepayment Station in Boston

Owing to the congestion in the Boston street car subway, particularly at the Park Street station, the Boston Elevated Railway is planning to add a new rapid transit route, one terminal to be at the corner of Harvard Avenue and Commonwealth Avenue, the other to be at Lechmere Square in East Cambridge. Trains will be run through the existing subway over this route every four minutes during normal hours and every two minutes during the rush period.

A terminal prepayment area will be located near Harvard Avenue, Allston, between Commonwealth Avenue and Brighton Avenue, at which passengers arriving on surface cars from Watertown, Lake Street and other points west can transfer to the rapid transit service. The company considers that developments of the train service between definite terminals and the interchange of passengers between surface lines and these rapid transit lines have been the basis upon which Boston's system must develop, and this new routing is just the extension of this idea.

Mandamus Proceedings in Progress

Set for June 1 and postponed one day, the mandamus proceedings brought by the city of Minneapolis to compel the Twin City Rapid Transit Company to produce for examination by the city attorney, Neil M. Cronin, and the valuation expert, Delos F. Wilcox, certain account books which it had not produced when acting upon an order by Judge H. F. Dickinson of the District Court partially, are under way before Judge W. C. Leary of the same court. The city claimed that the company had not yet produced data prior to 1900, notwithstanding the order. It is desired to enforce as a question of law a claim that the company owns and operates the Minneapolis Street Railway as part of its preparation of a case before the State Railroad and Warehouse Commission, opposing any further advance in the rate of fare from 6 cents and instead suggesting a lower rate than 6 cents. The company alleged it is ready to produce these books. The city threatened contempt proceedings against every officer of the company as a move to get further access to the books.

The hearing was continued on June 5.

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Personal Mention

John Kerwin—Track Expert!

Official of Detroit United Railway, Noted for Inventions, Is Leaving Railway Field

With the passing of the Detroit United Railway from the streets of Detroit, John Kerwin, superintendent of tracks for that company, has decided to terminate a service of thirty years and retire to private life, devoting his time to his real estate holdings in Detroit.

Mr. Kerwin joined the ranks of Detroit's street railways in 1892. Starting at the lowest rank of street railway work, by sheer ability and personal genius he advanced himself through every phase of the work, on the street, in the shops and in the executive offices.

In 1893 he went to work for the old

JOHN KERWIN

Detroit City Railway, shoeing horses. It was still the day of the horse cars, but a new era had dawned. In 1894 and 1895 some of the old street railways were consolidated under Tom Johnson into the Detroit Citizens' Street Railway and Mr. Kerwin was placed in charge of the shops. These years saw the complete change from the horse cars to the electric cars. Mr. Kerwin, in his small shop and with crude equipment, designed and built much of the special trackwork pieces adapted to the need of the electric cars.

On Dec. 31, 1900, the Detroit United Railway was formed, consolidating all the street railways in Detroit. Early in 1901 Mr. Kerwin was appointed superintendent of tracks, which position he held up to the time of his recent resignation.

During his service Mr. Kerwin has built or rebuilt every foot of street railway track in Detroit. He not only saw the railway grow from a comparatively small mileage to one of the largest systems in the country, but it was his inventive genius which aided largely in the accomplishment. He created and originated many nationally used devices and much labor-saving machinery, such as the Kerwin portable crossover and the Kerwin rail grinder. Among his latest labor-saving machines is a concrete mixer with a capacity of 600 cu.yd. of concrete in ten hours, which handles all its materials unaided from the cars into the finished product.

Mr. Kerwin has also recently invented and patented a steel railway tie which has been under test for two years in paved track construction on the Detroit United Railway interurban lines and has proved successful.

For years Mr. Kerwin has been recognized by engineers generally as a leader in the art. Many street railways have copied his standard construction of paved track. He has probably been as widely consulted in developments and disputes on track construction work as any other engineer in the field.

G. W. Wagner Leaves D. U. R.

"Hang up your hat, wash your face and go to work." Twenty years ago these words were addressed by A. H. Stanley, then superintendent of the Detroit United Railway, to a boy in knee pants who applied to the company for a job. To be exact, it was in 1901. The superintendent of the railway is now a lord and helped England win the war. The boy has grown, too. No nation has yet officially recognized his services as in the case of Mr. Stanley, but "Gus" Wagner, who is leaving his railway work in Detroit, is a very young man yet. There is still plenty of time.

Romance just rages around Mr. Wagner. He is a page of the Henty books reduced to life. As a go-getter Peter B. Kyne's hero isn't in it with "Gus." Wagner, the lad, got his job with the Detroit United by his frank answers. He was one of a bunch of candidates. When young Wagner was asked by Mr. Stanley if he smoked, Gus replied that he did when he could afford it. The whole philosophy of the man is contained in that remark.

How this doctrine became inculcated in the boy does not matter. He had it. And it was the ladder on which he has climbed to success in the railroad world. Young Wagner did everything he was told to do and a lot more than he was told to do. He carried the message to Garcia. Shortly D. U. R. officials began instinctively to turn to Wagner when they wanted anything done. The world was making a beaten path to his door. The Emersonian-Hubbard bit of philosophy was being proved. For five years Mr. Wagner worked in the operating and passenger offices. Then he joined A. F. Edwards in the purchasing department, where he advanced step by step, finally succeeding Mr. Edwards as purchasing agent when the latter became treasurer of the company.

C. B. Fairchild, Jr., President

Executive Assistant, P. R. T., Elected to Head the Pennsylvania Street Railway Association

C. B. Fairchild, Jr., executive assistant Philadelphia Rapid Transit Company, was elected president of the Pennsylvania Street Railway Association at its convention in Harrisburg on June 1 and 2. Mr. Fairchild has been an officer of the association for the past three years and has been active in promoting its work.

Mr. Fairchild started his work in the electric railway field as an assistant on the editorial staff of the *Street Railway Journal*, upon leaving his course at the College of the City of New York in 1895. In 1899 he became assistant editor of the *Electric Railway Review*, for which publication he traveled extensively abroad and in this country, gaining a very good knowledge of oper-

C. B. FAIRCHILD, JR.

ating practices and railway construction generally. In 1904 he became associate editor of ELECTRIC RAILWAY JOURNAL and in 1906 joined with H. J. Kenfield in starting *Electric Traction Weekly*. He sold out his interest in this paper in 1909 and became statistician of the Chicago City Railway Company, of which T. E. Mitten was then president. He remained in Chicago until 1911 and then went to Philadelphia as executive assistant to Mr. Mitten on the Philadelphia Rapid Transit System. In 1920, in addition to his duties as executive assistant, he was made chief statistician. In 1918 Mr. Fairchild wrote "Training for the Electric Railway Business," published by Lippincott as one of a series of books on how to train for business.

Fairchild, the younger, as Charlie is familiarly known, is of the second generation of that family to be prominently connected with the industry. His father was editor of the *Street Railway Journal* in the early nineties. The father was primarily an editor and author and secondarily a street

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railway man. With the son, however, the process has just been reversed. While he was first of all an editor, still the real work of Mr. Fairchild, Jr., has been done in active street railway service, to which he has applied the talent of tenacity which necessarily is a part of the equipment of every successful journalist. It is pretty well assured that under Mr. Fairchild the work of the Pennsylvania Association will be carried forward vigorously, for he knows well the needs of such associations, both from his long service with the industry and from the inside as a result of his connection some years ago as secretary of the New York State Street Railway Association.

D. H. Blanks Resigns

The Monongahela Power & Railway Company, Fairmont, W. Va., has announced that Major Don H. Blanks, manager of railways, has tendered his resignation to become effective on June 1. At that time he will become a partner of a general contracting firm at Greensburg, Pa.

E. B. Moore, general manager, announced that W. C. Kline, who for a number of years has been chief engineer of the local company, would assume Major Blanks' duties under the title of acting manager of railways and would hold that position with his own, until a permanent successor is chosen.

Major Blanks joined the Monongahela Power & Railway Company in 1916 as chief engineer, assuming direction of the lines then under construction. He had had previous experience in steam railroad construction with the Pennsylvania Railroad, the New York Central & Hudson River Railroad and the Long Island Railroad. He later was connected with the Southern Pacific Railroad in Mexico. Before joining the company at Fairmont he was associated in the construction of the line between Cumberland and Connellsville for the Western Maryland Railroad. He is a graduate of the University of Missouri.

J. F. O'Hare Made Boston Elevated Trustee

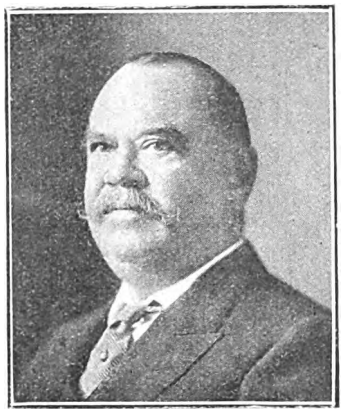
J. Frank O'Hare has been appointed by Governor Cox of Massachusetts as a trustee of the Boston Elevated Railway, to fill the vacancy caused by the death of John F. Stevens. He is to be the labor representative on the board of public trustees, as was Mr. Stevens.

Mr. O'Hare has held numerous positions with state committees and state commissions as the representative of labor.

He was appointed by Food Administrator Herbert Hoover a member of the New England Milk Commission, the Fair Price Committee and the Federal Food Board of Massachusetts, served as a member of the State Fuel Administration, Boston Fuel Commission and in 1918, was made a special assistant to the New England Fuel Administrator. In 1919 he was appointed by Governor Coolidge to serve on the Advisory Fuel Committee to meet the crisis caused by the marine engineer strike. In 1921 he was appointed by Governor Cox to serve on the committee to investigate the request of the railroad executives of New England for an increase in freight rates. Mr. O'Hare is a member of the Boston Printing Pressmen's Union.

W. E. Dunn Heads California Association

W. E. Dunn, the recently elected president of the California Electric Railway Association, has lived in California for some thirty-five years. He studied law in Michigan and was admitted to the bar in that State, but went to California at the age of twenty-one and began the practice of his profession in Los Angeles. After serving some years in the city's legal department (for two terms as City Attorney), he entered the local legal department of the Southern Pacific Railroad. Here he became associated with H. E. Huntington. That was about twenty-five years ago and close association with the Huntington interests has been continuous ever since.



W. E. DUNN

When Mr. Huntington began the organization and construction of the Pacific Electric system, Mr. Dunn gave up his position with the Southern Pacific to work on the new enterprise. When the Pacific Electric was sold to the Southern Pacific, Mr. Dunn again resigned to stay with Mr. Huntington and took active part in the operation of the Huntington properties. Mr. Dunn has been identified with the Los Angeles Railway since its inception; first as attorney in connection with some fifteen or twenty other Huntington properties, and for the last four years as vice-president, representing Mr. Huntington in an executive capacity and devoting all his time to the Huntington companies.

Mr. Dunn is well known as an attorney; in addition to his railroad work he has been a partner in a firm of practicing attorneys for twenty-five years. The firm name, now Gibson, Dunn & Crutcher, is still being continued, but Mr. Dunn is no longer in active practice.

New Public Relations Department Established

A department of public relations was created on April 15 by F. C. Chambers, president of the Des Moines City (Iowa) Railway. It is headed by E. L. Marriage, assistant to Mr. Chambers. Mr. Marriage is a new man in the city railway game, but has had considerable experience with the public, and the department is being received very kindly by the public and press of Des Moines. It is already operating to the distinct advantage of the street car riders of the city. Complaints and suggestions are getting immediate attention and the company is finding that its contact with the public is getting closer every day.

The clubs and civic organizations have all demonstrated a willingness almost unexpected to co-operate with this new department and the new official is being kept busy with these bodies and beneficial results are already being obtained.

The work of the department will not be confined to the public alone, a great deal of its work being centered upon the relations of the company with its own employees.

P. J. Mitten, President of Mitten-Traylor Inc.

After twenty-five years' experience in the electric railway field, the latter ones with the Philadelphia Rapid Transit Company, P. J. Mitten now takes on new duties as president of Mitten-Traylor Inc. Throughout most of his long career in the traction industry. Mr. Mitten has been closely associated with his brother, Thomas E. Mitten, collaborating with him in the development of the near-side car and many other modern traction improvements.

In his recent capacity as chief engineer of the Philadelphia Rapid Transit Company, Mr. Mitten has been serving on a special committee investigating all new forms and developments of transportation, chief of which has been the motor bus. This investigation included a study of the use of the motor vehicle in England and other foreign countries.

In Mitten-Traylor Inc. Mr. Mitten plans to engage in a broader field of service to the entire industry in the making of engineering analyses, managing and assisting in the financing of public utility properties and in the distribution of the Mitten-Traylor Motorbus, trackless trolleys and gasoline trail cars.

With Mr. Mitten is now associated J. F. Collins, formerly general engineer of the Philadelphia Rapid Transit Company, now chief engineer of Mitten-Traylor Inc. Mr. Collins, prior to his Philadelphia Rapid Transit connection was mechanical officer with the Field Artillery, A. E. F. When the war broke out, he left his position as general manager of one of the large motor truck manufacturing companies, to join the colors.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Foreign Trade Convention Results

The ninth foreign trade convention, recently held in Philadelphia, Pa., resulted in the advancement of a large number of ideas for the improvement of foreign trade in the United States and the restoration of normal trade conditions throughout the world. A statement which was read and adopted at the banquet which closed the convention concluded with: "Our foreign trade has suffered in the past through lack of persistent efforts to hold and develop fields in which a footing has been gained. This is the time above all for activity, courage and persistence. It is peculiarly essential to remember that it will cost much more to regain in the future a business lost now through lack of courage and tenacity."

The fact that conditions in Europe are far from satisfactory was brought out at the convention, and it seems certain that a complete resumption of foreign commerce cannot be looked for until they have improved. A large number of suggestions which no doubt will prove beneficial were brought forward.

Conditions Good in Portland

The Portland (Ore.) Railway, Light & Power Company will spend over $600,000 in 1922 on track renewal and paving work on the city lines. The Portland company is feeling optimistic about business conditions. The general business of the city is going ahead on a substantial basis. There is a very good demand for lumber for both export and domestic markets and the heaviest local building in the history of the city is also in progress. Another indication to the company of the general prosperity of the community is the readiness with which it has been able to dispose of its 7 per cent prior preference stock direct to the public. Of this stock, $600,000 was disposed of in the first ninety days.

Trend of Prices of Building Material and of Building Wage Rates Since 1913

That the years during and since the World War have witnessed radical changes in the wage rates of the building trades, and not only radical but spectacular changes in the prices of building material, is forcefully brought out in an article in the May *Monthly Labor Review*, published by the United States Department of Labor through the Bureau of Labor Statistics. To show relatively the changes that have taken place since 1913 the accompanying table of index numbers is drawn from the *Review*.

Beginning with 1917, building material prices constantly advanced above building wage rates until 1920, in the spring of which year building material as a whole had reached triple the prices of 1913 and wage rates as a whole had nearly doubled the level of 1913. Beginning with the spring of 1920 and continuing through into 1921 there was a heavy fall in building material prices. Building wage rates, however, more than held their position between 1920 and 1921. The change in the carpenters' wage rate practically coincides with that of all building wage rates combined.

In presenting these figures it is stated that a revision back to 1913 has been made in the index number of wholesale prices of building material previously published. Prices of lumber have been obtained in more representative markets. In addition, structural steel, nails, pipe and a number of other articles are now included under building material.

New Contracts Let for Interborough Yards

The refusal of the Board of Estimate of New York City last year to approve contracts for additional permanent facilities at the Lenox Avenue shops, between 147th and 148th Streets, made it necessary for the Transit Commission to award contracts for temporary facilities, which will later have to be scrapped. The cost of the temporary work will be $50,610. It covers the construction of a temporary shed at the Interborough yards at 147th Street and Lexington Avenue, together with the necessary frogs, tracks, switches, etc. The contractors are John B. Roberts & Company, whose bid for part of the work was $27,325, and the Reynolds Contracting Company, whose bid for the rest of it was $23,285.

Another contract awarded by the commission was for the construction of tracks, switches and bumper posts in the East 180th Street yard of the Interborough company. This contract went to the Slattery Engineering & Construction Company, whose bid, the lowest, was $7,505.

On June 26 the commission will receive bids for the installation of tracks in the Fourteenth Street-Eastern District subway from Sixth Avenue, Manhattan, to a point near Meserole Street, in the Bushwick district of Brooklyn, the end of the subway section of the line. When these tracks are installed and the signal system is ready for use, the subway part of the line will be ready for operation.

Survey of Manufactured Products to Be Made

At the request of Secretary Herbert E. Hoover of the Department of Commerce the American Engineering Standards Committee will undertake a canvass to determine what simplification in manufactured products is most needed and most desirable. This can-

INDEX NUMBERS OF THE LOWEST, HIGHEST AND AVERAGE WHOLESALE PRICES OF BUILDING MATERIALS IN EACH YEAR AND OF UNION WAGE RATES PER HOUR IN MAY, 1913 TO 1921

Building Material, Average 1913 = 100—Union Wage Rates, May 1913 = 100

Year	All Building Materials	Lumber	Brick Common	All Building Trades Combined (May)	Bricklayers (May)	Carpenters (May)
1913						
Lowest	96	95	99	...	...	...
Highest	103	104	101	...	...	...
Average	100	100	100	100	100	100
1914						
Lowest	88	87	99	...	...	...
Highest	94	94	99	...	...	...
Average	92	92	99	102	102	102
1915						
Lowest	88	87	96	...	...	...
Highest	104	97	102	...	...	...
Average	94	89	99	103	103	103
1916						
Lowest	110	99	101	...	...	...
Highest	132	108	125	...	...	...
Average	120	102	108	106	104	106
1917						
Lowest	138	113	125	...	...	...
Highest	169	144	139	...	...	...
Average	157	135	132	113	107	115
1918						
Lowest	161	148	149	...	...	...
Highest	179	161	194	...	...	...
Average	172	155	176	126	115	126
1919						
Lowest	169	158	202	...	...	...
Highest	248	292	213	...	...	...
Average	201	210	206	145	128	146
1920						
Lowest	204	209	245	...	...	...
Highest	300	378	295	...	...	...
Average	264	307	279	198	175	195
1921						
Lowest	156	151	204	...	...	...
Highest	192	194	272	...	...	...
Average	165	163	232	201	173	198
1922						
January	157	166	204	...	...	...
February	156	165	202	...	...	...
March	155	164	200	...	...	...

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vass will be conducted through the engineering and technical bodies having representatives on the committee or co-operating in its work.

This assignment to the American Engineering Standards Committee is one of Secretary Hoover's steps to retrieve for American industry a few of the many billions of dollars wasted annually as revealed in the report on waste in industry, which was made not long ago by a committee of the Federated American Engineering Societies. The latter committee found that waste in industry was due largely to an over-multiplicity in number of products as well as to inefficiency in process.

Receivers Plan Improvements

In a petition filed in the United States District Court the receivers of the Pittsburgh (Pa.) Railways propose to increase the one-man car equipment.

Other improvements include the construction of a "Y" on the Etna car line in order that trailers may be attached to motor cars, according to the petition. Additional feeders to cost $8,500 are needed in Penn and Liberty avenues from the Thirteenth Street substation for the use of the return and ground electric currents.

The double tracks in California Avenue, Northside, are in need of repair and it is estimated $35,000 will be required to do the work.

In West Fifth Avenue, McKeesport, it is planned to spend $46,000 repairing the tracks.

The location of the tracks between Dunlevy and Allenport on the Charleroi line is to be changed at a cost of $31,000.

It is estimated that $55,000 will be required to repair the tracks in Island Avenue extension, Stowe township.

In Chartiers Avenue, McKees Rocks, the tracks are in such shape that the receivers believe $27,500 will be required to make them safe.

Improvements in Washington, Pa., are planned at an estimated cost of $93,700. The tracks are to be replaced in four different places.

Nine hundred vacuum oilers, to cost $3,625, will be purchased for use on cars.

Two double-truck steel dump cars and three concrete mixers which will cost $35,000 are needed in the service, the petition states.

Metal, Coal and Material Prices

Metals—New York	June 6, 1922
Copper, electrolytic, cents per lb.	13.937
Copper wire base, cents per lb.	15.75
Lead, cents per lb.	5.725
Zinc, cents per lb.	5.70
Tin, Straits, cents per lb.	32.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$6.075
Somerset mine run, Boston, net tons	3.15
Pittsburgh, mine run, Pittsburgh, net tons	....
Franklin, Ill., screenings, Chicago, net tons	...
Central, Ill., screenings, Chicago, net tons	
Kansas screenings, Kansas City, net tons	2.725
Materials	
Rubber-covered wire, N. Y. cents per lb.	5.75
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$1.97
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	91.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	96.00

Rolling Stock

Lafayette (Ind.) Electric Railway recently received seven of the new cars from Philadelphia and the remainder are expected shortly.

Tulsa (Okla.) Street Railway will supplement its electric railway service with four buses, which will be placed in operation on July 1.

San Diego (Cal.) Electric Railway placed ten new Birney safety cars in service on June 1 on the Mission Hills line. Express trains of two large two-man cars will be continued in operation during peak-load periods.

Havana Electric Railway, Light & Power Company, Havana, Cuba, during 1921, finished and put into service fifty-one passenger cars, and six old cars of same type were entirely reconstructed. Four equipments of G. E. 52 motors were replaced by G. E. 264 motors.

New Orleans Railway & Light Company has awarded orders for seventy-five cars to the J. G. Brill Company, of Philadelphia, and for twenty-five cars to the Perley Thomas Car Works, of High Point, N. C. The contemplated order was mentioned in these columns in the issue for May 6. The motors will be furnished by the Westinghouse Electric and Manufacturing Company, and the trucks by the J. G. Brill Company. The cars are to reach New Orleans completely assembled, delivery to begin Aug. 1, 1922. The type of car will be that now in use on the St. Charles Street Belt line, which were built at the Perley Thomas car works.

Track and Roadway

Jackson, (Miss.) Public Service Company has started construction work on its tracks to extend the line to the entrance of Livingston Park.

South Covington & Cincinnati (Ohio) Street Railway, Covington, Ky., will lay new rails on Thirty-fourth Street, Latonia, Ky. The improvement will extend a little over 1 mile.

Pine Bluff (Ark.) Company has been making repairs to the car tracks on West Second Avenue. Heavier steel has been laid. The work cost $12,000.

Lafayette (Ind.) Electric Railway is doing the general overhauling on its tracks very rapidly. The Oakland Hill line has been relaid and opened for business. Two other lines will be repaired before using new cars on them.

San Diego (Cal.) Electric Railway has made application for franchises to lay rails on Sixteenth Street between Market Street and Broadway and on Twenty-fifth Street between Imperial Avenue and Broadway.

Indiana Service Corporation, Fort Wayne, Ind., is rushing the work of constructing the addition to the Lakeside Street car line in Fort Wayne to Kensington Boulevard. It is expected that the work will be completed within a comparatively short time.

Winnipeg (Man.) Electric Railway is now extending its double-track line on Academy Road from Ash Street to west of Lindsay Street, a distance of about ½ mile. The cost of the extension will be in the neighborhood of $75,000.

Montreal (Que.) Tramways will lay double tracks from McGill Street to the Lachine Canal at Wellington Street bridge. The company is also planning to construct a double-track line along Shakespeare Road and double track its line on Cote des Neiges Road north from Westmount Boulevard.

Public Service Railway, Newark, N. J., has been directed by the Board of Public Utility Commissioners to pay 10 per cent of the cost of removing its grade crossing at Smith Street, Perth Amboy. The board also directed the Central Railroad and the Lehigh Valley Railroad to eliminate grade crossings in that town.

Little Rock Railway & Electric Company, Little Rock, Ark., will have to pave its portion of Main Street. Work of repaving Main Street from Markham to Eighth Street, will soon begin, and the Mayor of the city promised to co-operate with the street commissioners in compelling the railway to do its share.

Fort Worth, Tex.—It is planned by W. P. Welty of Fort Worth and associates to start construction of an interurban electric railway between Fort Worth and Lake Worth about July 1. Mr. Welty was granted a franchise for the proposed line nearly a year ago. It will be 4½ miles long from the point of beginning in Rosen Heights, a suburb of Fort Worth. It is estimated that the cost of construction will be about $200,000.

United Traction Company, Albany, N. Y., will have to expend nearly $600,000 for new track work in Albany and Troy this year, according to testimony of D. L. Waters, auditor of the company. In Albany the work will be done on Clinton Avenue from North Pearl to Robin Street, and on Second Avenue from South Pearl Street to Delaware Avenue. New rails will be laid on Oakwood and Second Avenues and other streets in Troy.

Ocean City (N. J.) Electric Railroad through its trustee, has requested permission from the City Commissioners to lay tracks and run cars on Central Avenue, from Eleventh to Ninth Street. The cars now run out Eleventh street to Wesley Avenue and along that thoroughfare to Ninth Street. The proposed change will bring passengers a block nearer Asbury Avenue, the main business street in Ocean City. The commissioners have called a public hearing for June 12 on the application.

Portland Railway, Light & Power Company, Portland, Ore., may have a franchise to operate on Fiftieth Street, southeast, and over Foster Road, if an ordinance shortly to come before the City Council is passed. The company

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long held a private right of way along Foster Road, but when the city took over this thoroughfare some months ago, it yielded its right of way to the city. Following the laying of the sewer lines, recently completed, the road is to be improved and double tracks of the railway are to be laid along the center of the roadway.

Muskegon Traction & Lighting Company, Muskegon, Mich. has requested permission of the City Commission to make some extensive improvements to its property. It desires to double-track its line the full length of Western Avenue, the main business section of the city. It also desires to double-track a portion of its lines on Lake Shore Drive to provide for better service in this section of the city. In addition the request calls for the resurfacing of the streets along much of its line. Owing to the financial condition of the company due to competition with bus lines, it is the first extensive improvements planned in more than two years.

Power Houses Shops and Buildings

Detroit (Mich.) United Railway will build a 150-ft. addition to the paint building of the Highland Park shops and equip it for a machine, truck and body shop to serve the interurban system.

Washington & Old Dominion Railway, Washington, D. C., will transfer its terminal to the Virginia end of the new bridge being built across the Potomac at Washington when that structure is completed. At present the Old Dominion Company maintains its terminal on the District of Columbia side of the bridge. The new bridge will have better facilities for the operation of more electric cars and for that reason it is planned to have the cars of the Capital Traction Company operate across the bridge rather than make its terminal at the District of Columbia end of the structure. The change will be made about Jan. 1, 1923.

Trade Notes

John F. Schurch has been elected a vice-president of Manning, Maxwell & Moore, Inc., and, effective June 1, will take charge of the company's Western sales, with headquarters at the Chicago office, 27-29 North Jefferson Street.

Templeton, Kenley & Co., Chicago, Ill., recently furnished the track department of the Chicago Surface Lines with 206 Simplex jacks to replace a like number of old-type jacks. The order came as a result of an eighteen-month test to determine the effectiveness of the Simplex jacks in reducing construction and repair costs and their ruggedness and durability.

Anaconda Copper Mining Company reports a good wire business on the Pacific Coast and states that during the last two days it has booked an order for another 1,000,000 lb. of wire from the Pacific Gas & Electric Company. Two months ago the Anaconda Company made a final shipment on a 10,000,000 lb. wire order for this concern. The plant, which has a monthly capacity of 8,000,000 of wire and rods, is operating at between 6,000,000 and 7,000,000 at present.

Service Motor Truck Company, Wabash, Ind., through its railroad division has released a large quantity of Midwest 4¼ x 6-in. engines for its gasoline propelled railway coaches. This particular engine is a comparative newcomer in the Midwest line, having been developed for heavier duty requiring high speeds. It develops and is guaranteed 59 hp. at 1,200 r.p.m. and 70 hp. at 1,500 r.p.m. The torque peak is increased 50 per cent over that of the 4¼ x 6-in. Midwest engine.

Carborundum Company, Niagara Falls, N. Y., has arranged with the Rothacker Film Manufacturing Company for the production of a film entitled "The Jewels of Industry" which is virtually a survey of American industry. The picture shows how carborundum is produced at the temperature of 4,000 deg. F. The film visualizes the various processes by which crude carborundum is converted into grinding wheels and other forms of abrasives to meet the needs of industry.

Nic Le Grand has purchased the machine shop and brass foundry in Rock Island which has been manufacturing the truck and car parts that he has been selling to the electric railway field, and has incorporated under the firm name of "Nic Le Grand, Inc.'" With these manufacturing facilities under his own control Mr. Le Grand will be in a better position to furnish the electric railway companies with what they want in the way of small manufacturing parts, to enlarge his field of usefulness and improve his capacity for service to the electric railways.

General Electric Company, Schenectady, New York, has decided that in order to establish all of the necessary equipment for railway motor construction in the Erie plant the railway controller department is being transferred from the Schenectady works to this plant. The department is to be enlarged gradually and to start with, will employ from 125 to 150 men to be selected in Erie. H. A. Nye, who is director of industrial service, said that the Erie works does nearly all of the railway motor work and the transfer will help to give the plant more complete equipment.

New Advertising Literature

Sherwin-Williams Company, Cleveland, Ohio, has recently issued a new insulating varnish catalog.

Schweitzer & Conrad, Inc., Chicago, Ill., has issued Bulletin No. 108 descriptive of the Type R pole top air break switches. The success of the improved design of these switches is the message of this bulletin.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has issued Bulletin No. 1123 "Small Steam Turbines." This line of turbines is suitable for driving condenser auxiliaries, exciters, small generators, etc.

Fort Pitt Spring & Manufacturing Company, Pittsburgh, Pa., has just issued catalog No. 3 relating to coil and elliptic springs. Specifications for various types are given, together with information as to their capacity.

Roller-Smith Company, New York, N. Y., has issued bulletins Nos. 560 and 820. The first of these describes the company's line of circuit breakers, types E and P, and the latter PV ammeters, voltmeters and small direct-current instruments.

General Electric Company, Schenectady, N. Y., has just issued bulletin No. 47,326, describing its type QC-3 quick break lever switches. These are used for voltages up to 600 and for currents up to 1,000 amp. Dimensions of these switches are fully explained.

Ohio Brass Company, Mansfield, Ohio, has issued a folder describing the National trolley guard. This guard is a trough of wire mesh inserted over the trolley wire for use at grade crossings and other points where the jumping of a trolley wheel from the wire would result in a dangerous condition.

Westinghouse Electric & Manufacturing Company, Pittsburgh Pa., has just published a catalog supplement describing the company's line of insulating and soldering compounds. It is known as 5-A, Supplement No. 2, and describes baking and air-drying varnishes, insulating compounds, finishing materials, including paints, enamels, lacquers, etc., insulating glue, soldering flux, and lubricating oil.

Day & Zimmerman, Inc., New York and Philadelphia, have published in pamphlet form a code of ethics drafted for and in use by that organization. The code includes such maxims as: He profits most who serves best; the honesty which is unswerving; the honor that scorns unworthy deeds; no man liveth unto himself; the courtesy of kindliness; the loyalty that defends its own; no man is free who is not master of himself; life's best triumph is the triumph of principle; whatsoever things are worthy; keep the faith. Each rule is expanded by explanatory text.

Cooper Hewitt Electric Company, Hoboken, N. J., will publish a series of industrial lighting briefs to deal with important phases of the subject. Two of the series have been issued recently, one called "Industrial Lighting in Theory and Practice," by E. Leavenworth Elliott, which appeared in the *Electrical Review* for Oct.; the other is a digest of an article on comparative cognitive reaction time with lights of different spectral character and at different intensities of illumination, written by Martha Elliott for the *American Journal of Psychology*, in January, 1922.

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Spirit of Optimism Pervades A.R.A. Convention

THE happy spirit that a brighter day has dawned for the railroads of this country filled the delegates to the convention of the American Railway Association, Mechanical Division, at Atlantic City this week. Through the electrification of steam roads the electric railway industry has become interlocked with the railroads, and many of the exhibits show equipment of particular interest to electric railways. In size, this year's exhibit of equipment and supplies surpasses anything previously held. This is another evidence of the confidence of manufacturers that the present increase in business will continue in greater proportions.

Supply men and equipment manufacturers have a particular opportunity at this time to show their equipment to officials in many of the railroad branches as meetings are to be held of the Purchases and Stores Division, the Air Brake Association and the Railway Electrical Engineers, as well as the Mechanical Division. Indications are that a large attendance from all branches will result.

No "Battle of the Systems" at International Railway Congress

PRACTICAL interest in electrification appears to be more immediately active abroad than here. One reason is probably because coal is scarcer and consequently more expensive in Europe than in this country. Another is the smaller size of the railway systems and, in many cases, a greater supervision of them by the government, most of the countries having government ownership. While such a situation has its drawbacks it has certain advantages, and one of them probably is that standardization both in electrical and other lines is more easily secured. These thoughts are suggested because of the International Railway Congress just concluded at Rome, where electric traction held a prominent place among the questions considered. It was the first meeting since the war of this steam railroad organization, which formerly held meetings every five years, that of 1905 being held in Washington.

It is perhaps most appropriate, at least so far as the electrification papers were concerned, that the meeting was held in Italy, which has abundant water power but no coal of its own. In consequence much of the pioneer work in steam railroad electrification in both direct-current and in three-phase work has been done in Italy. Since the pioneer days, great progress has been made, especially in the direction of planning for a superpower system to unite the water powers of the Apennines and the Alps. With this background it is not surprising that, according to the reports received from abroad, the attendance at the electrification meetings was larger than at the other technical functions of the congress.

If this was because a contest was expected between the advocates of the different systems there was disappointment, because, in general, the conclusions reached were that every system not only has its advantages, but that all are susceptible of considerable improvement. Moreover, where locomotives are changed, no great difficulty is encountered if the new locomotive operates over a different electrical system. This seems a sensible view, and if accepted here the energies now exerted by advocates of individual systems could be devoted to setting forth the merits of electricity as a motive power independent of the system.

What Will Be the Rail Joint of the Future?

DID the attendants at the session of the Quebec convention of the Canadian Electric Railway Association devoted largely to the subject of rail joints appreciate the significance of what they heard? Probably not, with the exception of the way engineers who were present. Fortunately for the discussion, there were on hand, in addition to the Canadians, a number of such engineers who were in Quebec attending a meeting of the American Engineering Association committee on way matters, as well as representatives of the manufacturers of several types of joint.

E. B. Entwisle started the ball rolling with a paper on the standard bar-weld joint and the new butt-weld joint of the Lorain Company. His statement as to the extent of use of the bar-weld joint during the past twenty-eight years indicates that it is entitled to be treated with great respect. Repeat orders praise the joint eloquently. The vigorous development in the art of welding during the past few years, however, brought other types of rail joints to the fore, but they all owe much to this pioneer, because it has established confidence in the weld as a factor in rail joinery.

The electrically welded joint has appealed strongly to way engineers on account of its permanence and self-bonding character. They have felt the need for a type or types of weld, in addition to the bar weld, which would involve less apparatus than that one; something that would be inexpensive even with a few joints. This is one of the reasons for the great interest in the thermit weld, the arc weld and the electric butt weld.

Another good reason for the interest in welded joints generally is the activity of welding engineers and manufacturers of welding apparatus for making rail joints and for other purposes. The war gave this activity a great stimulus. It has come to a head in the committee on welded rail joints, which is functioning under the auspices of the American Welding Bureau. This committee is commandeering the best available technical talent to assist in solving the rail joint problem in its essentials. The details will then work themselves out in accordance with the ideas of individual manufacturers and engineers. In connection

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with its program the committee hopes to build a testing machine which will permit joints to be subjected in a few days or weeks to a cumulative stressing that in service would require years. They will need money for this, and the industry can well afford to support the program because it will repay its costs many times over. This machine is described on page 977.

One feature of this joint matter which is giving engineers much concern is the effect on the properties of the rail steel of the high temperatures which are involved in all welding operations. Obviously to produce a real weld requires a temperature considerably above the melting point of the steel. Just what this does to the steel is not yet definitely known. Mr. Entwisle said at Quebec that a post-heating of the electrically welded joint to 1,500 deg. F. was necessary to relieve internal stress set up by the process. This fact suggests one line of research which must be followed. Another has reference to chemical effects of high temperature. The committee has thus a lot of work of its own to do, as well as the task of gathering and analyzing the results of the service tests of commercial joints under all kinds of operating conditions.

As to the rail joint of the future, it will be one designed and made in accordance with scientific principles. And is there such a joint now available? Ask the committee.

Effect of New Freight Rates on Electric Railways

THE general 10 per cent reduction in steam road freight rates directed recently by the Interstate Commerce Commission will precipitate much thought as to what steps should be taken with respect to freight rates in the electric railway field. In some instances where there is keen competition a readjustment to the steam road level or possibly a lower rate will be necessary if traffic is to be held. However, before a new lower traffic schedule is put into effect, electric railways should give careful consideration to the possibility of maintaining present rates even though these may be equal to or slightly higher than the competitive steam rates, on the basis of providing a superior service. The electric lines are able to give an overnight delivery between any two points on their respective systems. Such service is more nearly comparable with the express service on the steam lines than with the freight service, and accordingly a higher rate for a faster service is not only justifiable but is salable to the shipper. It would seem to be better business to attract traffic by the quality of service rather than by cut rates.

The Peak of the Strike Load Was in 1917, 1918 and 1919

THE smallest number of strikes of street railway employees for six years occurred in 1921, according to the last issue of the *United States Monthly Labor Review*, which gives statistics of all recorded strikes and lockouts in this country for the six years ended 1921. In 1916 there was the comparatively moderate number of fifty-five street railway strikes. The three following years make up the "rush period," with 118, 117 and 109 respectively. In 1920 the number dropped off to eighty-one, and in 1921 there were only eleven street railway strikes. In addition to these numbers the bureau reports one street railway lockout in 1916, one in 1919 and one in 1921. The number of strikes in other industries follows about the same relative proportions in the different years, although in number of employees concerned, the proportion is different.

Some of the figures involved in the strikes in general industry are tremendous. Thus, to take 1916, which is by no means the year of greatest strike activity, the total duration of the strikes was 46,305 days, and the average number of persons per strike involved was 594, making the total something like 27,000,000 person-days. In 1919 nearly 4,000,000 persons were involved in strikes, and the average length was thirty-four days, making the enormous total of 136,000,000 person-days.

U. S. Supreme Court Declares Union to Be Suable

THE chief point of interest to electric railway companies in the Coronado Coal decision of the United States Supreme Court is the conclusion by the court of the suability of the United Mine Workers of America, although it is not incorporated. This point was not the only one at issue and some of the others were decided in favor of the United Mine Workers, so that the case was remanded to the District Court for further proceedings in conformity with the decision of the Supreme Court.

The reasoning of the court that a union, at least one of the size and nature of the one concerned in the Coronado case, is suable is based broadly on four grounds, although the court admits that in common law an unincorporated association of persons is not recognized as having any other character than a partnership. The first of these grounds is that commercially the union organization is an entity distinct from its members, and as such can hold property, issue notes, register trade-marks and do many other acts like a corporation. The second reason is that legally unions have been recognized in many states as having the attributes of artificial persons who are capable of suing or being sued. The third is the wording of the anti-trust law which includes among those who may be sued "corporations and associations under or authorized by" federal or state laws. Finally, the court points out that the question is after all in essence and principle merely a procedural matter. If the members of a union are liable to suit and recovery, the only question is whether they may not be sued as a body.

This decision clears up what otherwise has been an unreasonable situation. Up to this time the unions have claimed many, if not all, of the privileges while avoiding the responsibilities which go with incorporated bodies. This anomaly is well expressed in the decision of the English Court in the Taff Vale case, quoted in the Supreme Court decision, as follows:

> If the contention of the defendant society were well founded, the legislature has authorized the creation of numerous bodies of men capable of owning great wealth and of action by agents with absolutely no responsibility for the wrongs that they may do to other persons by the use of that wealth and the employment of those agents.

The best interests of organized labor will be served by accepting a position of responsibility in the commercial world. Business men will naturally be much more willing to make a contract with an organization which is financially responsible than one which is not. In fact, a contract must be two-sided to be of any real value. If one side is bound and the other not, the mutual consideration or advantage, which is the essence of every contract, is lacking.

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Manufacturing Rolled Steel Wheels

The Author Shows How Certain Changes in Buying Practice Are of Direct Benefit to the Buyer or User of Rolled Steel Wheels—Lack of Familiarity with Manufacturing Conditions on the Part of Users Is a Prolific Cause of Increased Costs and Poor Deliveries

BY GEORGE A. RICHARDSON
Midvale Steel & Ordnance Company
Cambria Steel Company

THE statement was made at a meeting of the Central Electric Railway Association several years ago that while the steam railways of the country were adhering to about nine types of wheels for their rolling stock more than 360 types were in use on the electric lines. This situation continues at the present time with little change.

On another occasion the salesman of a certain company went into the office of one of the officials of a large interurban system and was tendered an order for a small number of wheels with the statement that quick delivery was imperative. The reply was that if a larger order could be given it would be much easier to get it out promptly. To make a long story short the upshot of the conversation was that it developed that the giving of small sized orders was largely a matter of habit; that they could readily be consolidated into a few good sized ones without any inconvenience.

The important thing in connection with these two incidents is that they typify conditions which have a most important bearing both on the costs and the deliveries of the specialty under discussion. When a salesman makes the statement that a larger order would very likely facilitate prompter delivery it is apt to be considered as good selling talk and in the same way a bid for standardization is likely to seem more a question of benefit to the manufacturer than the consumer.

As a matter of fact lack of familiarity with manufacturing conditions is responsible for this attitude and the object of this article is to point out some of the things involved in the making of rolled steel wheels and show why an approach to standardization of types and consolidation of orders is not only helpful to the manufacturer but is of direct benefit to the buyer and user.

In considering the facts in hand, they must be viewed from two angles: First, that of the practicability of carrying a stock of material or equipment on hand and, secondly, what is involved where small lots of varying designs must be made. While the details of method in the making of rolled steel wheels vary somewhat with the different manufacturers, the essential conditions remain the same. Hence though the writer speaks from the practice of one company, the problems involved apply in a greater or less degree to all.

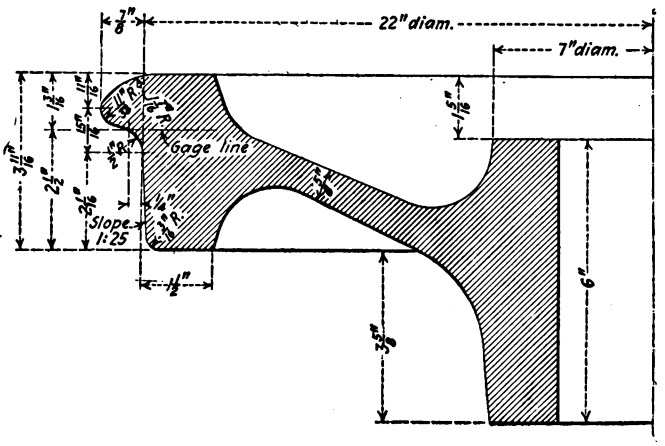
Delivery times are influenced: (1) By the ability of the manufacturer to stock rough or finished material; (2) by the practicability of stocking special equipment, and (3) by the time involved in changing equipment, more particularly with reference to the resultant hold-up in production especially during busy periods.

Extra costs are determined: (1) By the increased overhead resulting from the necessity of carrying large and expensive stocks of special equipment such as dies, rolls etc.; (2) by the necessity of making modifications in equipment on hand or building new; (3) by the actual time and labor involved in changing dies, rolls and other parts, and (4) by the reduction in average daily production necessitated by changing dies, rolls, etc. This is not only a question of the financial loss due to the actual output of the wheels but also entails the losses due to large amounts of expensive machinery and equipment lying idle and increasing the proportional overhead.

STEPS IN MANUFACTURING

In order to have a thorough understanding of just how these things enter into consideration, the best thing to do is to start in at the very beginning and take up the various manufacturing steps one by one, mentioning the practice of one well-known company.

The start of the operations consists in taking sink



FINISHED SIZES OF ROLLED STEEL WHEELS, WITH REVERSE CONING

head ingots having a cross section 22 in. square and rolling them down in a 32-in. mill to round blooms having a diameter of 11 in. or 15 in., according to the size of the wheel that is to be made. These in turn are hot sheared with rotary shears into blocks of the desired length.

It is customary to carry large stocks of these blocks on hand, 5,000 tons or more, in order to facilitate the getting out of orders, but right here at the very beginning the first difficulty is encountered. These blocks cannot be used for any wheel that is desired. They are only suitable for making the one type or design which they have been cut for. This means that stocking up is limited to a narrow range of the more commonly used sizes of blocks. When the wheels specified are different from those commonly used it becomes necessary to roll and shear specially for the order, which, of course, is a source of delay under the most favorable conditions and may mean additional expense.

In taking up the conversion of the block into the finished wheel it should be borne in mind that, regardless of all other costs, the one charge of overhead on equipment that must lie idle while changes are being made is not a small one and mounts up rapidly.

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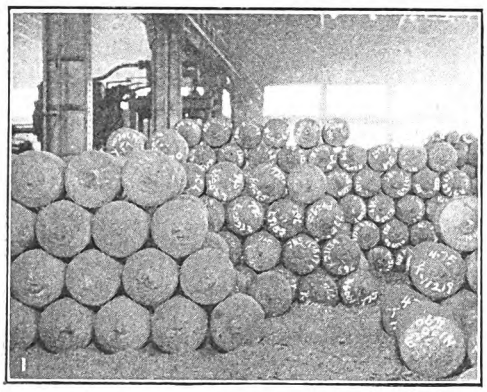
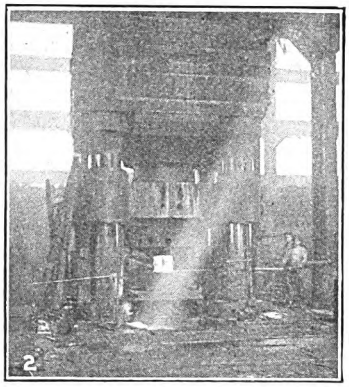
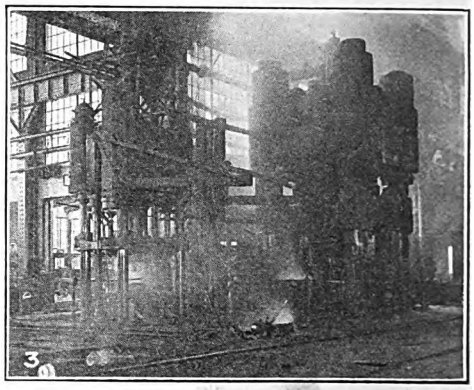
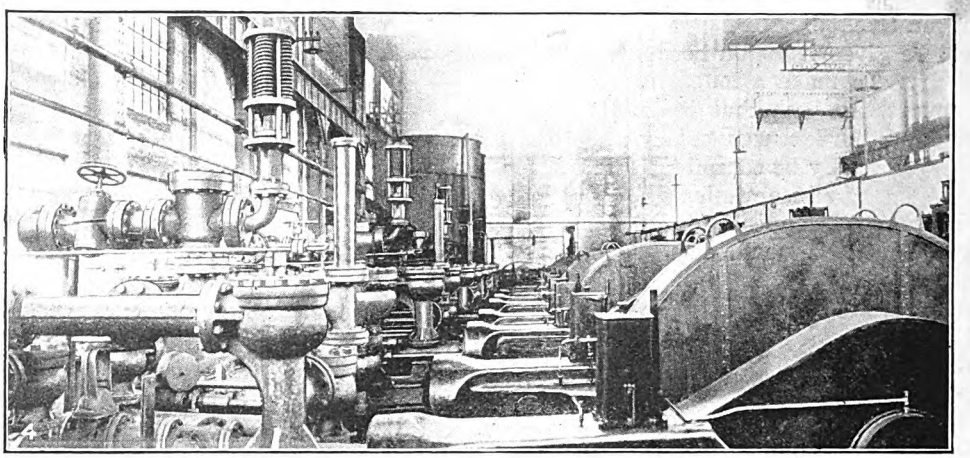
Furnaces must be kept up to temperature, with the consequent consumption of fuel, and output is reduced.

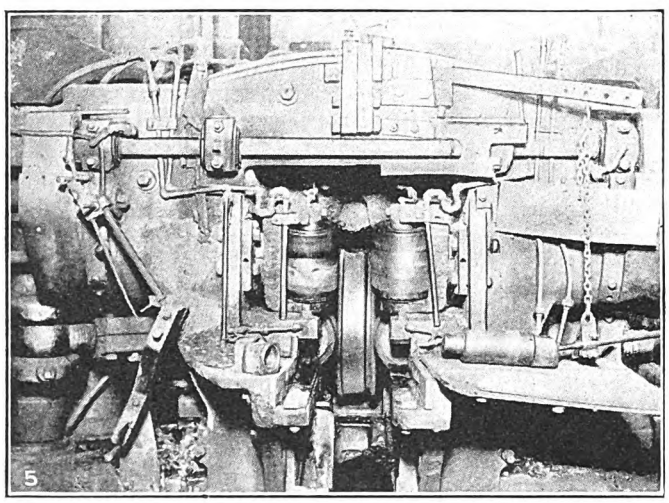
The above does not take into consideration the dies, rolls, etc., that must be used, but merely the basic equipment such as the presses, wheel mills, pumps, etc. When an entirely different type of wheel is to be made a complete change of rolls, dies, etc., is necessary. A full set of equipment for one type of wheel involves an outlay of about $3,000. This may be modified somewhat, depending entirely on the differences in the design of the wheels. Not only is it necessary to make complete changes when a different type of wheel is to be made but it is also imperative that a stock of parts for the more commonly ordered types be carried in stock. At the plant described the total weight of equipment, such as rolls, dies, etc., carried in stock amounts to more than 2,200 tons, the greater part of which is idle at any one time. Standardization would be of immense benefit in making it possible to cut this stock down and very materially reduce the overhead charges as a result.

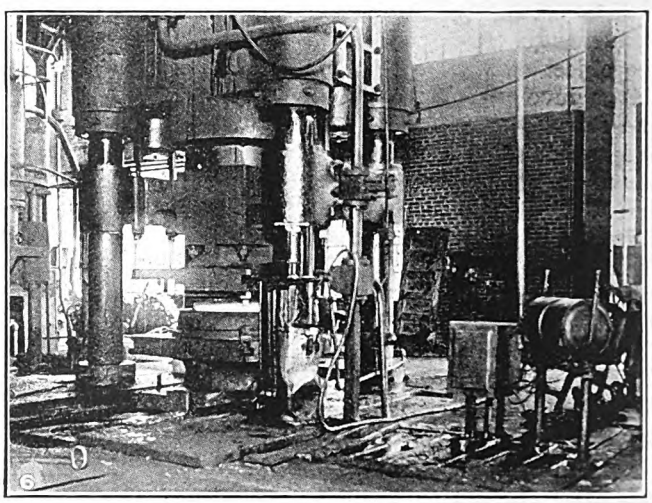












PROCESSES AND EQUIPMENT USED IN MANUFACTURING STEEL WHEELS

No. 1. Stock of blocks from which wheels are made.

No. 2. 12,000-ton hydraulic forging press used for first forging operation; block in position ready for pressing.

No. 3. At right—12,000-ton forging press used for second forging operation. At left—punching press.

No. 4. View of compressor room where the water for the hydraulic presses is pumped.

No. 5. Front view of wheel mill. At top and in front are the edging rolls. Below and back can be seen the web rolls. In the middle is the back roll. At first glance this back roll looks like a wheel in position for forging.

No. 6. Coning press.

The layman is not apt to realize the number of parts that are necessary in making the changes in set-up for a given type of wheel. More than twenty-five separate parts are involved weighing from a few hundred pounds each up to as much as 6,000 pounds. Twenty-two of these are illustrated on page 961. From these figures

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alone it can readily be seen that the time element itself involved in making a complete change is very considerable. The pictures themselves show the rolls, dies, etc., used in making a 33-in. street car wheel. There is little change, however, in general size and appearance for other types of wheels.

Five distinct sets of operations and three heatings are involved in making wheels at the plant under discussion. The blocks are brought to forging temperature and then undergo a first forging operation under a 12,000-ton press. A wash heat follows and then comes the second forging operation under another press of similar capacity. After this the hub is punched. Next in order is another wash heat, followed by rolling in the mill and then pressing in the coning press. The wheel is now ready for hot bed, hot bed inspection, machining and final inspection.

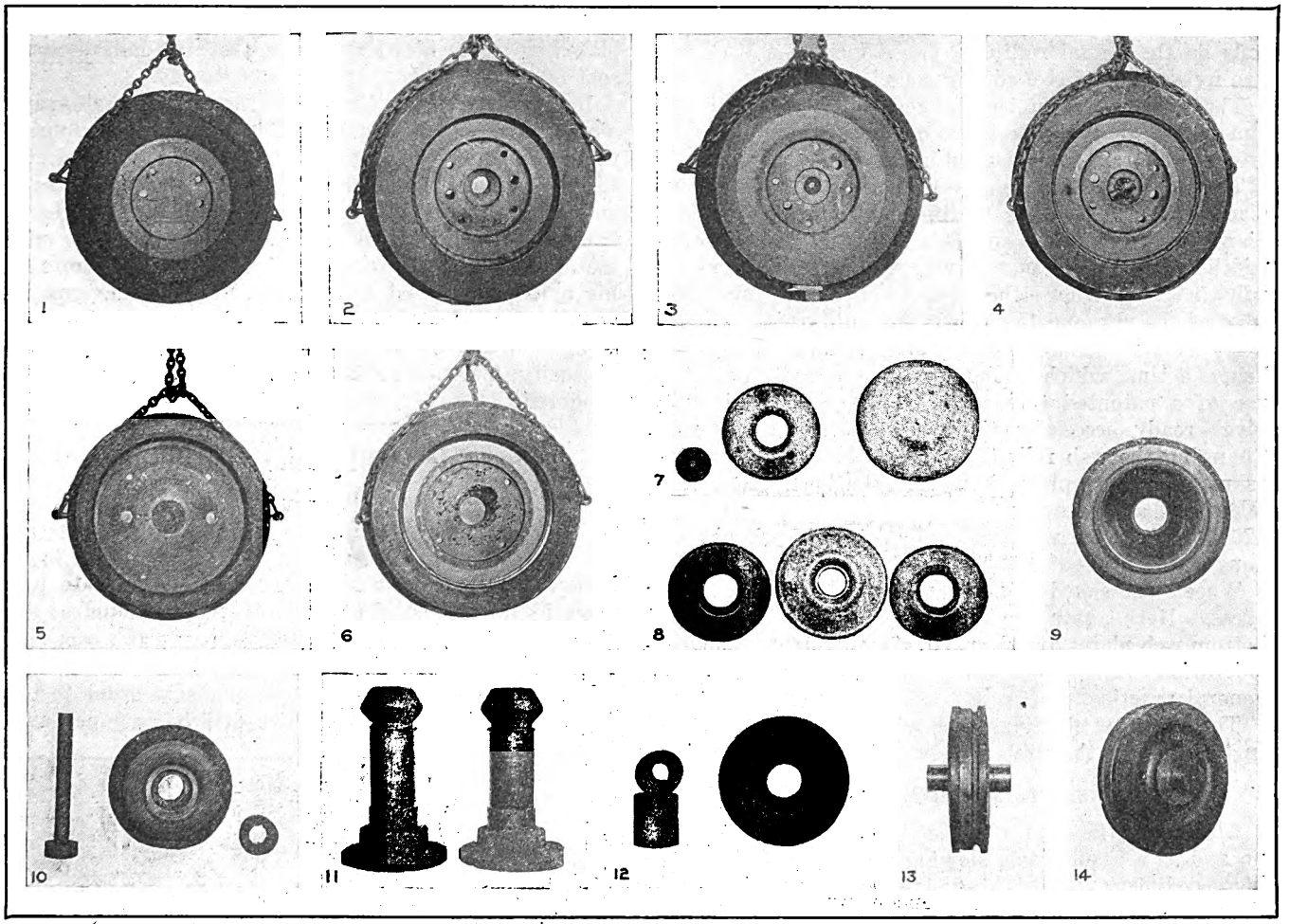
Any change in diameter or width of rim of wheel necessitate a complete change of dies throughout with the single exception of those used on punching press.

When the diameter and rim widths remain the same, but hub diameter or rim thickness vary, a change of die plates is necessitated. As a matter of fact this is really equivalent to changing dies as far as the time element is concerned because the dies must be loosened from their fastenings in order to assemble the plates. Die plates for all standard wheels are carried in stock, but any departure from standard necessitates machining new ones. In many cases, due to the use of a standard counterbore, it is possible to use the same die plate in more than one die. In general the weight of the dies remains fairly constant. In other words, lighter wheels do not mean much lighter dies.

Taking the various operations in their sequence, let us see just what is involved in setting up and changing dies, etc.:

In the first forging operation the block is flattened and part of hub and web started. For this two dies, two web plates and an extractor are required. For a 33-in. freight car wheel the bottom roughing die weighs about 6,000 lb., the top roughing die 4,500 lb., the top web plate about 700 lb. and the bottom web or die plate 100 lb. The forging is done in a 12,000-ton hydraulic press. The time required for changing the dies is about one-half hour and requires a crew of four men, including the crane man.

In the second forging operation the hub, web and flange are formed. Top and bottom second forging or finishing dies are required together with top and bottom web plates and extractor. The weights, changing time, etc., are practically the same. The only difference is in the shape of the contour in the top web plate.



DIES AND ROLLS USED FOR FORGING OPERATIONS

No. 1. Top of first forging die.
No. 2. Bottom of first forging die.
No. 3. Top of second forging die.
No. 4. Bottom of second forging die.
No. 5. Top of coning die.
No. 6. Bottom of coning die.
No. 7. From left to right—Acorn—Bottom of first forging web plate—Top of first forging web plate.
No. 8. At the sides—top and bottom of second forging web plates. In the center—bottom coning plate.
No. 9. Top of coning plate.
No. 10. From left to right—Extractor—top of punch die—hub punch ring.
No. 11. Web rolls complete with shanks and flanges.
No. 12. At left—Edging rolls. At right—bottom hub of punch die.
No. 13. Front view of back roll.
No. 14. Side view of back roll.

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Few changes are required at the punching press. The same dies are used for different diameters of wheels, the only time a change is necessary being when the hub diameter varies. When the length of the hub varies this is taken care of by liners which raise or lower the wheel.

The parts required are the punch, mandrel and top and bottom punch dies, which weigh about 200 to 300 lb. each. The time necessary for changing dies at the punching press will average about fifteen minutes, the press operator and two helpers being required.

After the pressing and punching operations mentioned, the wheel is given a wash heat and then taken to the wheel mill and rolled. A mill of the vertical type shown in the illustration is used. Five rolls do the actual rolling. These include a back roll, two web rolls and two edging rolls.

The back roll must be changed for any variation in rim width. This can be taken out without removing the front, the total time required being about one hour.

The edging rolls are never changed except for replacement. They swing on different angles for different diameters of wheels and are adjusted for different widths of wheels. Change of web rolls becomes necessary only in cases where the distance between the inside edge of the rim and the hub is very different.

A complete change takes about one and one-half hours, a time which is shorter than normal due to the use of a patented removable front on the mill which gives ready access to the web rolls and back rolls. Changing the web rolls takes practically the same time as making a complete change as the back roll can be taken out at the same time. Back rolls weigh about 225 lb., while the web rolls, complete with shanks and flange, weigh about 1,500 lb. each.

Wheels are coned and stamped in a hydraulic coning press. Here again top and bottom dies and top and bottom web plates are required. In the plant under consideration solid dies are used, which is a departure from general practice.

The time for changing dies will average the same as in the case of the first and second forging operations.

Inspection and Machining

Change in the type of wheel involves changes in setup and as a result some slowing up in production. The biggest difficulty at this stage is encountered when other than standard contours are specified because it then becomes necessary to make special tools. The effect of changes on the time required for inspection is practically negligible.

The data and information given herewith in themselves would have little of interest to the average outsider, but viewed in the light of the effect of changes of specification and variety of orders they become quite important because they bring home very forcibly some of the reasons why standardization and consolidation of orders are advantageous.

There are several other things worthy of consideration. In the first place consider the effect of die changes, etc., upon daily production. Under average working conditions it is safe to say that die changes will cause a loss of 10 per cent to 15 per cent in the output, a figure which is not a small one by any means and very definitely influences costs.

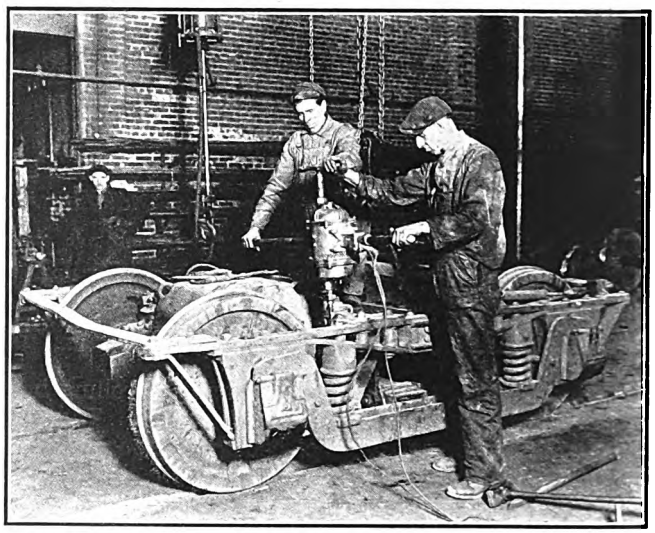
A stock of wheels is a fine thing from the standpoint of making possible very prompt deliveries, but no manufacturer can afford to carry a wide variety of types and sizes. At the plant described from 5,000 to 7,000 tons are regularly carried in stock of the standard sizes and these can be bored to meet customers' requirements. But such a stock does not take care of the many special types which are so commonly met with in electric railway work, nor can it.

It is of interest to note a typical case of modification in design and its effect on cost and to a certain extent on delivery. The wheel shown in the line cut on page 959 has reverse coning. While dies in stock were all right to use, this reverse coning necessitated the making up of a complete set of top and bottom die or web plates for the first and second forging and the coning operations. This meant delay in production owing to the fact that nothing could be done until the plates were machined and added several dollars to the cost of each wheel.

It is hoped that these few facts and photographs which have been presented will aid in showing some of the advantages to be gained by standardizing electric railway wheels as much as possible and also of consolidating orders. In the last analysis, though the manufacturer gains by it, the consumer gains much more. The manufacturer must operate at a profit and his prices are based accordingly. Special designs and small orders at a time, all of which require changes in equipment and the resultant lowering in production, of necessity increase selling prices, while deliveries are hindered.

Portable Drill Makes Dismantling Unnecessary

THE accompanying illustration shows a Little Giant size 4-SS portable electric drill in operation in the Federal Street car shops of the New York State Railways in Rochester. This type of drill is found of special convenience for drilling truck parts and other car equipment so that immediate repairs can be made without dismantling the various parts in order to take them to a drill press. This size drill has a pipe handle



Drilling Motor Suspension with Portable Electric Drill

and feed screw. The drilling capacity of this size is 1½ in. in steel and 3 in. in wood. Electrical connection is made by means of two cables, one for the trolley connection and the other for the ground, which in a repair shop can be conveniently attached to the rail. The New York State Railways has four of these drills.

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Keeping Sleet Off Trolley Wires

Experiments Show that Wires Can Be Kept Free of Ice, but So Far No Considerable Applications Have Been Made on a Commercial Scale—The Author Covers the Fundamental Principles and Outlines Possibilities

BY H. H. SENER
Railway Equipment Engineer, Westinghouse Electric & Manufacturing Company

THE collection of current from trolley wires coated heavily with sleet or ice is a problem that has long confronted electric railway operating men. In territories where freezing weather is encountered there are usually several sleet-forming periods during the winter months of each year, when traffic is very badly delayed due to broken wires, burned collectors, etc. In some instances the crust of ice on the wire becomes so thick that it is necessary to suspend operation entirely for periods of from one to three days.

Fortunately, the formation of sleet and ice as a rule occurs within a rather narrow range of temperatures; that is, between — 3 deg. and + 2 deg. C. Under the proper conditions ice will form on practically any object exposed to rain or mist between these temperatures. Metallic objects, however, such as wires and steel structures, are always more heavily coated than trees and buildings, the formations also adhering more firmly to the metal.

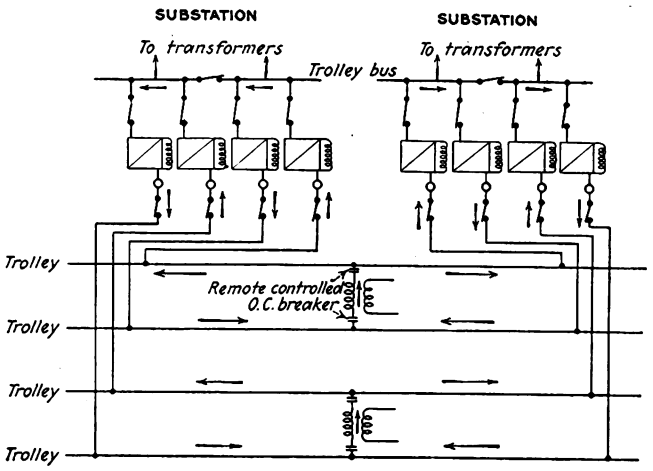
The actual amount of sleet accumulation depends entirely on the severity of the storm and on local conditions, such as elevation above sea level, winds, etc. It is not uncommon during severe sleet storms to have branches of trees and other objects become coated with ice to the thickness of an inch or more. An illustration reproduced shows a rather extreme case on a telephone line where the ice reached a thickness of 2½ in. Ice of much less thickness will insulate the trolley wheel or pantograph completely from the wire.

Numerous ways and means have been devised for combating the sleet nuisance. Some of these have met with a certain amount of success. They may be divided into two general classes: (1) Ways and means for removing sleet, and (2) ways and means for preventing the formation of sleet.

SCRAPING OFF THE SLEET AFTER FORMATION

In the first class are ice scrapers and sleet wheels. The scraper is attached to the trolley pole in such a way as to slide along the wire ahead of the collector, while the sleet wheel has a corrugated groove and acts as a combination scraper and collector. These two devices used separately or together are probably about the only sleet weapons in use at the present time. Still, while they are to a certain degree effective they are somewhat destructive of the wire and overhead construction, and also several cars or motive power units on each line must be so equipped during the sleet-forming periods. In this class, also, are various devices for melting the sleet as the car or locomotive moves along. An example of the heater type is a device which resembles a large electric iron and which is made to slide along the wire in front of the trolley wheel or pantograph in the same way as the scraper. Its main disadvantages are its weight and the fact that it is only effective at very low speeds.

After all of these various devices have been tried and none found that are entirely satisfactory, the railway engineers and also the transmission engineers (who by the way have a similar problem) have been turning their efforts toward finding some way to prevent the sleet from forming on the wire. This is possible if the wires can be kept at a temperature of a few degrees above freezing, so that the particles of ice will be melted or the drops of water will not congeal on striking the wires. Also, in the case of trolley wires,



WIRING DIAGRAM SHOWING ARRANGEMENT OF TRANSFORMERS FOR SUPPLYING CIRCULATING CURRENT TO PREVENT FORMATION OF ICE ON WIRES

a coating of grease or some salt solution can be applied to the wire at intervals which will tend to rot any ice that does form. Both of these methods and the results of some tests made on them will be discussed later.

A few words as to what has been done toward sleet prevention on transmission lines will be of interest in this connection. The troubles produced by sleet in this case are both mechanical and electrical. Mechanical troubles include failure of cables, crossarms, insulators, poles and towers caused by the sheer weight of the ice load, accompanied often by excessive wind load. Electrical breakdowns and short circuits are also possible. They may be caused by long icicles on insulators or between wires; or by mechanical unbalance or distortion, as by unequal sag, due to uneven distribution of the ice load. For instance, all wires may be sagging due to load and suddenly the wind will free the lower wire, allowing it to come up and touch the others, which are still ice laden.

Several companies have been successful in eliminating these troubles by heating their wires during sleet storms, as previously mentioned. For instance, the Niagara Falls Power Company keeps its 2,100-ft. span across the Niagara River clear by transferring the entire load back and forth from one line to the other all

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keep it free from ice, with the following results: With wind velocities varying from 1 to 5 m.p.h. it was found that 225 amp. through a No. 0000 wire, 200 amp. through a No. 000 wire, 175 amp. through a No. 00 wire, or 150 amp. through a No. 0 wire is sufficient. Calculations of the conductor temperature rise in still air at 0 deg. C. with no water spray and with the above current give values of 14.1 deg., 14.2 deg., 14.6 deg. and 13.7 deg. C. for the No. 0000, No. 000, No. 00 and No. 0 wires respectively, so that it may be said that in general, with an air temperature not lower than — 3 deg. C., the current necessary to keep a conductor free from ice in a sleet storm is approximately equal to that current which, in still dry air, will give the conductor a temperature rise of 15 deg. C. above the 0 deg. C. ambient air. For high air velocities this figure should be increased from 100 to 150 per cent.

Grease Is Temporarily Beneficial

In connection with this same test, the effect of grease on the wire was also investigated. One of the wires was coated at three different places with lubricating oil, gear grease and vaseline respectively and was then sprayed with water as before. These different greases while they did not prevent the formation of ice altogether, did, while fresh, prevent it from adhering firmly to the wire. A few days later, however, after the grease had collected dust and dirt from the air, it had no noticeable effect whatever. Still, in territories where the air is comparatively dry and clean it may help the sleet situation considerably, for the coating that forms on the fresh grease needs only a slight jar to cause it to fall. In fact, it may be that the vibration of the wire due to an approaching car or locomotive would be all that is necessary. Grease may be of special advantage to direct-current systems where the current necessary to heat the trolley wire and feeders is almost prohibitive, due to the large current-carrying capacity in the overhead conductors and feeders.

Grease has been used to some extent by some mining companies, which find that it reduces sparking in addition to being of help in the sleet situation. Also the operating men of one New England railroad believe that the grease from the pantograph is responsible for the ease with which the ice can be knocked from their trolley wires.

There are numerous schemes which possibly are suitable for producing a circulating current in the trolley circuit, the one best suited for any system depending on the layout, type of overhead construction, etc., of that system. For instance, a double or four-track road, by reason of having several wires in parallel, presents possibilities for more different propositions than does one with only a single track.

A Plan for Circulating Current Locally

Of the various arrangements that have been suggested, the one that appears to be the best, from various standpoints, is shown in the diagram on page 963. Two transformers for supplying the circulating current are connected midway between two substations, and supply a heating current to the entire section. This flows in the direction of the arrows. The trolley wires are connected in parallel through the substation busbars.

The main advantage of this arrangement appears to be the fact that, due to the complete trolley circuit, there are no losses other than those utilized in heating the wire as there are in other proposed schemes. Its application, however, is limited to systems having more than one electrified track. Practically the same results, so far as sleet removal is concerned, can probably also be obtained on either single or double track by using reactance coils or resistance banks between trolley and ground, but in these there is a superfluous loss in the ground circuit. Also there are large heating losses in the reactors and resistors themselves. There is also the possibility of obtaining a circulating current by means of unbalanced substation voltages. This would be cheapest of all from the standpoint of installation, but the unequal voltages would make the regulation of the system poor during the time substations are unbalanced. Another possibility, which is a modification of the method shown in the diagram, would be to circulate direct current instead of alternating current. This does not seem, however, to have any apparent advantages and besides would require more expensive machinery and more attention during operation.

None of the devices and schemes mentioned has ever been actually used except the old sleet scraper and sleet wheel; the heating devices, the circulating current and the grease having never progressed beyond the experimental stage. Nevertheless, they may be worthy of consideration by railway operating engineers who are having troubles with broken wires or insulators and burned pantographs or trolleys during the sleet season.

Stone Hauling Produces Large Profits

Tiffin, Fostoria & Eastern Railway Earned 86 Cents per Car-Mile with Its Stone Hauling as Compared with 14 Cents for Regular Freight and 0.4 Cent for Passenger Traffic

By R. R. Hayes
General Manager Tiffin, Fostoria & Eastern Railway, Tiffin, Ohio

TO AUGMENT the decreasing revenue from passenger traffic, the interurban operator naturally turns to freight and express business. But, as is the case with the writer's road, the average interurban is limited in freight operations by the lack of terminal facilities. The tremendous amount of road building now under way throughout the country offers an unusual opportunity for interurban operators to bolster up their revenue by hauling road materials for road contractors. Operations of this nature require no terminal facilities and the profits to be gained are disproportionately large considering the equipment necessary.

As an example of what may be accomplished in this respect the following explanation of stone hauling done by our road may be of interest. In the spring of 1921 contracts were let for the rebuilding of roads paralleled by our lines and connecting lines. Stone for this work could be secured from a quarry served by our lines as well as by the highways. Transportation by rail, of course, being much cheaper than by team or motor truck, it seemed to be a very easy matter to get a contract for hauling this stone at an extra margin of profit.

Our equipment at that time did not include the proper kind of rolling stock to handle the job, however, so naturally the proposition resolved itself into finding equipment which would yield profits large enough practically to pay for itself on this first job. We purchased one Differential automatic dump car which seemed ideal

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for this operation. In addition to its automatic dumping features, its method of placing the material away from the track proved to be very advantageous. A two-way side dump car was used which has many features not to be found in cars of the older type. With this car we were not only able to handle a tremendous amount of stone but were able to distribute it in such quantities as were specified by the contractor.

We began operations with this equipment about July 1, 1921, and continued for three months. The net earnings for the three months from the stone hauling operations represented 81½ per cent of the first cost of the Differential car after deducting taxes, etc., chargeable to these operations.

Our net earnings per car-mile on our different phases of activity are indicative of the great possibilities of this type of operation for electric railways as shown by the following net earnings:

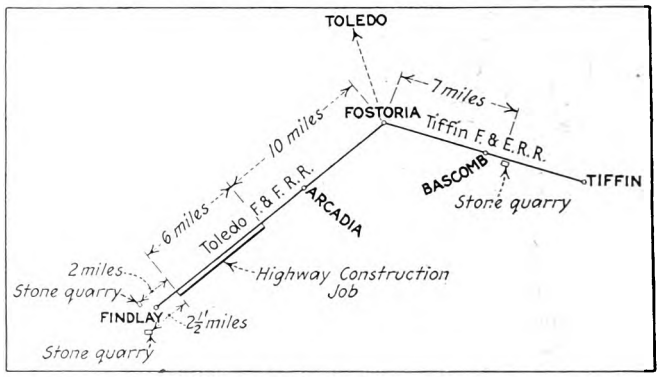
Passenger traffic	0.4016	cent per car-mile
Regular freight	14.1	cents per car-mile
Stone hauling	86.8	cents per car-mile

In explanation of the above it is well to note that these figures are based on the entire year's operation. Also that all expenses and taxes chargeable to each class of business have been deducted.

Another interesting and profitable phase of this operation was our switching and delivering over our lines of more than one hundred steam road cars of road building materials such as cement, asphalt, etc. Our Differential car in this instance served as an electric locomotive, and it was even more satisfactory for this purpose than an ordinary type locomotive, since by varying the load in the car in accordance with the number and weight of cars to be hauled we had at command a locomotive of from 25 to 50 tons.

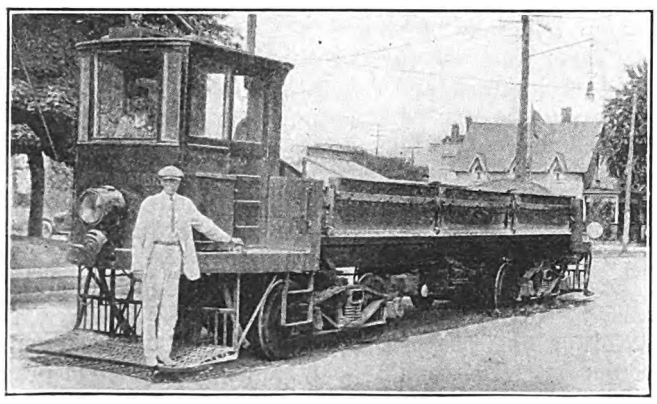
Saves Money for the Contractor

An interesting comparison may be drawn between motor truck and electric railway operation. The biggest part of this job had to be handled over a connecting line as well as our own. The accompanying diagram shows the lines over which the stone was hauled and also the location of the stone quarries at Findlay and between Fostoria and Tiffin. The equipments in operation at the three stone quarries are quite similar, so that the cost of stone at the quarry in each case is practically the same. The map gives the relative distances to the highway construction job, and it will be noted that the average haul for motor trucks is 5 miles, and for the differential car operating over two different railway lines is 20 miles. The contractor said that he saved about $10,000 by purchasing this stone from the Bascom quarry and having it hauled over the railway lines to the job rather than by purchasing it from the Findlay quarry and having it hauled in motor trucks. Our price for hauling this stone included good profits both for ourselves and the connecting company. Still we were able successfully to compete with motor trucks despite the fact that our average haul was 20 miles and motor trucks could have delivered the stone with an average haul of only 5 miles. Even further, our tariff, with good profits included, was so substantially lower than the competition that the road contractor's profit was materially increased. Aside from our low tariff the road contractor was well pleased with our manner of delivering the material, as we were able to place the stone just where he wanted it so as to cause minimum amount of labor on his part. The average tariff over our lines was 32 cents per ton for an average haul of 8 miles. The Tiffin, Fostoria & Eastern Electric Railway furnished the car and received one-half of the tariff from the Bascom quarry to the job. The Toledo, Fostoria & Findlay Railway received the other half of the tariff and paid the Tiffin, Fostoria & Eastern Railway 5 cents per car-mile rental on the car while on its line. That made an average of $1.30 per trip. The average load was 30 tons, and consequently the Tiffin, Fostoria & Eastern Railway received $10.80 per carload, while the Toledo, Fostoria & Findlay Railway received $9.10 per carload. Each railway furnished a man on the car, so that the platform expense was equally divided.



Map of Lines Over Which Stone Was Hauled

For the coming year we anticipate a stone hauling business even larger and more profitable than the year before. We are able to meet all competition by motor or horse-drawn vehicles and still make a very handsome profit.



Type of Car Used for Stone Hauling

Dumping a Load of Stone

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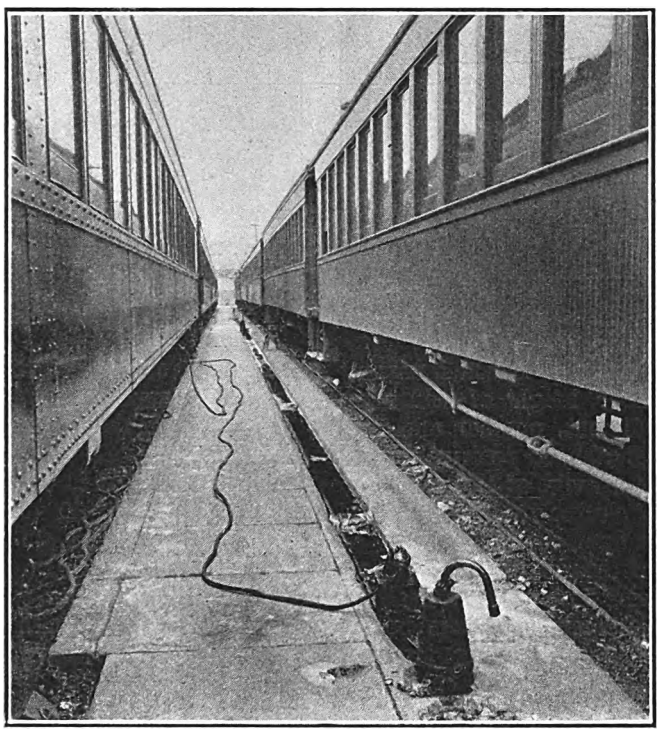
Maintaining Batteries on the Long Island

Complete Facilities Are Provided at the Morris Park Shops for Overhauling Batteries—Yard Is Wired with Convenient Outlets for Charging Batteries Without Removing Them from Cars

THE maintenance of storage battery equipment for lines like the Long Island Railroad which operate multiple-unit cars and maintain the car-lighting equipment of cars in steam service as well is a problem of considerable magnitude. The methods and equipment used for carrying on the work are therefore necessarily more elaborate than those used by the average electric railway. The equipment illustrated and described in this article is that used at the Morris Park shops of the company, where 1,157 sets of car-control batteries, 205 sets of train-lighting batteries and 613 cells used on three storage battery cars are maintained. These batteries are of various makes and types, Gould, Willard, Edison and the Electric Storage Battery Company's batteries being all used.



CHARGING BATTERIES ON A TRAIN OF CARS IN THE YARD

The majority of the work of overhauling, testing and charging of batteries is done in a building approximately 20 ft. x 80 ft., which is devoted entirely to this work. All batteries are removed from the cars for overhauling. Periodic inspection, flushing of cells, and charging where necessary, are taken care of in the inspection yard, which has very complete facilities for this work. An accompanying illustration shows a section of the yard between two rows of cars. The yard is piped with convenient outlets for air, steam, gas and water, and electrical connections are run in conduits with frequent outlets. Attachments can thus be readily made for charging by connecting flexible jumpers to the outlet and to the batteries. The current used is furnished by a Westinghouse Electric & Manufacturing Company's motor-generator set installed in the end portion of an adjacent brick building. The generator portion of the set is type SK, 60 kw., 110 volts, 545.5 amp. and 720 r.p.m. The motor end of the charging set consists of a type CCI induction motor of 90 hp. It is connected three-phase on a 25-cycle circuit, of 220 volts, 225 amp. and 720 r.p.m. An accompanying illustration shows the installation of this motor-generator set together with the regulating and charging switchboard panel. The switchboard has two charging panels, with ten charging circuits from the motor-generator set. The regulating of the value of the charging current is done through grid resistors, ten frames of which are installed over each charging panel. When a battery is removed from the car for overhauling, it is entirely dismantled. The connections between the cells are cut apart and the jars are removed from the wooden case. The plates, separators and electrolyte are then removed from the jars, and all are given a thorough washing in the washing room. An accompanying illustration shows the washing tank and various battery parts being cleaned. The wooden boxes are usually set on edge and a stream of water from the hose is directed into them, the force removing all dirt which may have accumulated. After the various parts have been washed, those which appear to be in good condition are set aside for further use, while the others are discarded.

The reassembling of the elements in the jars and the connecting and installing of the units in the wooden trays are done in a room adjacent to the washing room. For the lead batteries chemically pure sulphuric acid of a specific gravity of 1.82 is used. This is diluted to 1.21 by adding distilled water. This is then added to the jars preparatory to charging them. In charging both specific gravity and cadmium readings are taken every two hours for the first four hours (that is, two readings) then every half hour for the last four hours. The specific gravity at the end of the charge is 1.23. In charging control batteries, 5 amp. is used, and in charging the train-lighting batteries the charge is started with 60 amp. for two hours and then 45 amp. for the remaining six hours is used. In order to insure that the electrolyte is chemically pure, this, together with all water used, is tested chemically for copper, iron and nitrates. Also, whenever a battery is reported for trouble in service, the electrolyte in the cell is tested chemically.

Batteries are brought in for general overhauling once in two years and, of course, any batteries found on inspection which need overhauling are ordered in. All batteries are numbered and records are kept by battery number. Whenever a battery is overhauled detailed information is entered on a form, which is sent to the office of the superintendent of motive power for recording. This information consists of battery number, car number from which battery was removed, date

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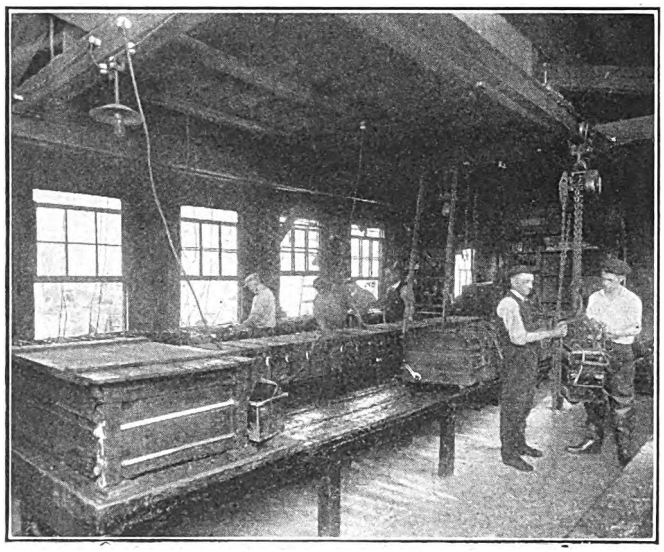
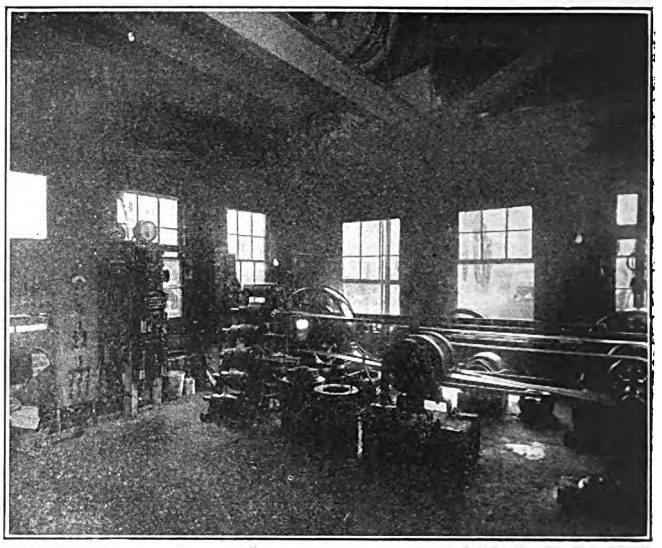


THE ASSEMBLING AND CHARGING DEPARTMENT. A TRAVELING OVERHEAD HOIST SERVES THIS ROOM



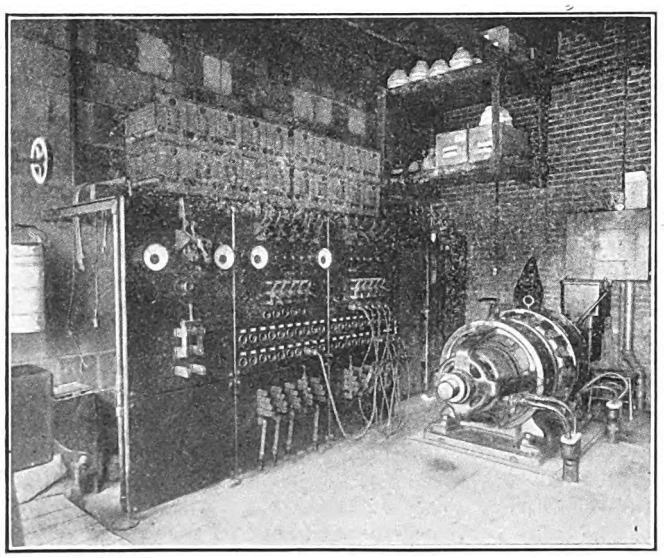
A CORNER OF THE GENERATING ROOM. CAR-LIGHTING GENERATOR READY FOR TEST IN THE FOREGROUND

removed, date overhauled, car number to which battery was returned, shop order number, height of acid when received, average depth of sediment, number and type of plates scrapped, average lengths of positive plates, condition of terminals, specific gravity of electrolyte on arrival, specific gravity of electrolyte before final charge, specific gravity after final charge, number of hours charged, average rate of charge, capacity of battery at time of overhauling, cadmium volts to positive, cadmium volts to negative, total ampere-hours put in while charging, material used in overhauling, together with cost, cost of labor for overhauling and total cost.

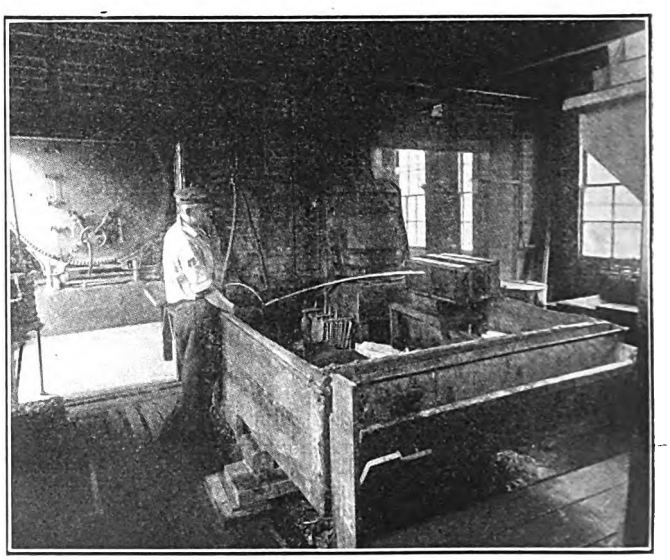
The form also contains space for remarks so that anything unusual found can be noted. The average depth of sediment found after two years service is ¾ in. In addition to the report made out by the battery inspector, a monthly report is sent to the battery foreman giving a list of batteries that have been in service two years or more and are due for overhauling. A monthly report of axle-lighting equipment is also sent to the superintendent of motive power. This gives a list of all material used in maintenance and overhauling, the number of batteries overhauled and a list of the troubles experienced. A record for each battery gives dates of removal and reinstallation and car numbers from which the battery is removed and to which it is applied.

In general the charging current is from motor-generator sets. A small set is used for charging control batteries. This consists of a generator of 1¼ kw. capacity, rated at 50 amp. and 25 volts full load. The motor is three-phase, 25-cycle, 6.2 amp., 220 volts, with a speed of 1,500 r.p.m. A large 30-kw. generator is used for charging car-lighting batteries. This is belt-driven from a Westinghouse Electric & Manufacturing Company's type S, variable-speed, shunt-wound, 20-hp. motor. The shaft of this motor also has a pulley for driving train-lighting generators while they are being tested. In the illustration showing the generating room one of these car-lighting generators is shown set up and ready for tests. Switchboards are provided for the starting and control of the motor and for regulating the battery-charging current. The charging board for the large generator has twelve frames of grid resistors mounted over the top and six lines from the generators to the switchboard and twenty-one lines outside to the battery-charging room. There is an ammeter and voltmeter on both the charging boards and the motor control boards.

Arrangement is also made so that batteries can be



MOTOR-GENERATOR SET AND SWITCHBOARD USED FOR SUPPLYING THE CHARGING CURRENT TO THE YARD OUTLETS



WASHING BATTERY BOXES AND ELEMENTS AT THE WASHING TANK

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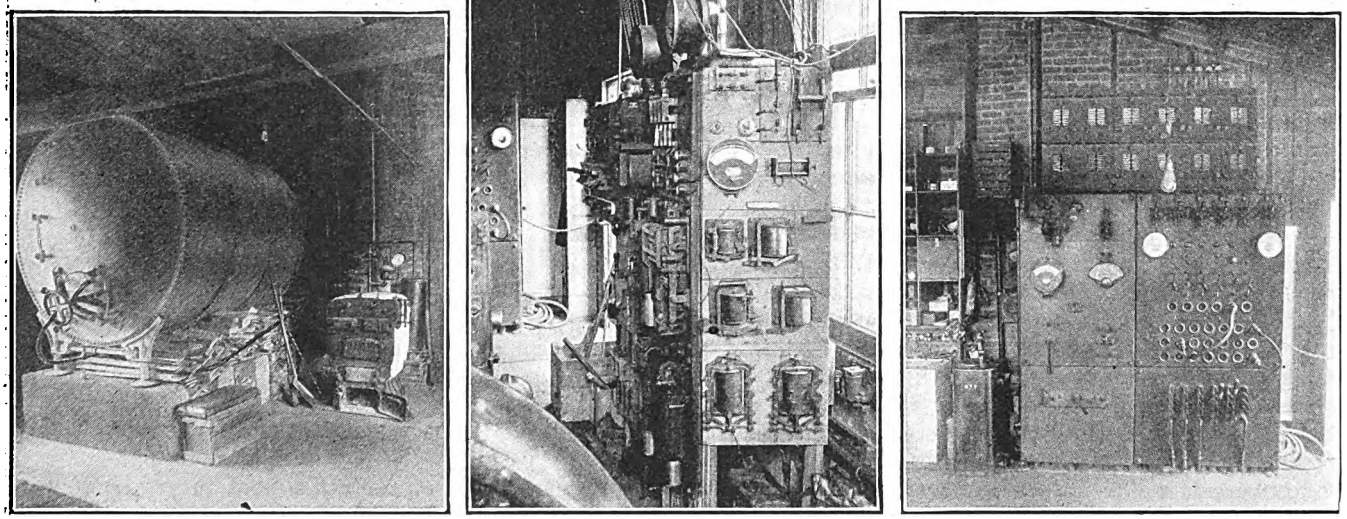
charged from a 650-volt direct-current line through resistance. This method of charging is used only when the volume of work is so great that it cannot be taken care of by the motor-generator set. As the 650-volt circuit is the same as that used for operating trains from the third rail, there is a considerable variation in voltage and current, so that a uniform charging current cannot be readily secured. In charging car control batteries, the variation is between 1 and 5 amp.

Car-lighting switchboards are provided so that when testing out the car-lighting generators they can be connected to the same equipment that they have in regular operation. A lighting load, the same as that on cars, is also provided. Two car-lighting panels are installed in permanent positions; one of these is a Gould Company's Simplex system type B, and the other a Safety Car Heating & Lighting Company's type D, 40 volts, 65 amp. A small wooden board is installed at the end of these car-lighting switchboards, on which various relays and switches used in connection with the car-lighting equipment can be tested out. These can be mounted in the same positions they are located in regular service and can be tested under regular service operating conditions. In testing out car-lighting generators connection is also made to the battery load as well as to the light load.



AT LEFT—DISTILLED WATER PLANT. IN CENTER—CAR-LIGHTING SWITCHBOARD USED FOR TESTING CAR-LIGHTING GENERATORS AND OTHER CAR-LIGHTING EQUIPMENT. AT RIGHT—CHARGING PANELS FOR THE BATTERY CHARGING ROOM

DISTILLED WATER PLANT

For providing the necessary distilled water for overhauling and maintaining batteries a special distilled water plant is installed in the room adjacent to the washing room. This consists of a furnace with boiler, a condenser and a large storage tank. Fifty gallons of distilled water can be produced in eight hours. Water from the city system is fed into the boiler through an automatic regulator. This provides automatic feed through the use of a float so that the height of water in the boiler is kept constant. A steam pressure of from 1 to 5 lb. is used. The condenser is located above the storage tank near the roof of the building, so that the water from the condensed steam is fed into the tank by gravity. Gages on the ends of the storage tank show the amount of water that is available for use.

Experimental Work in Tie Preservation

MUCH experimental work has been done by the United States Forest Products Laboratory in various lines of wood preservation, and probably no class of timbers has received as much attention as the cross-tie. On file at the laboratory are the records of 374 complete studies on thirty-eight species represented by more than 900,000 treated and untreated ties, enough for 300 miles of track. There are included complete data on the treating, time of setting, life, and inspection records, which make possible definite comparisons of the durability of various species, treated and untreated, and the effectiveness of the different treatments. The lack of value of some methods of treatment is evident, and the effectiveness of standard preservatives and practice is clearly shown. Although the exact durability of any specific tie depends upon the species, amount of sapwood, local conditions, and other factors, it has been determined that the average untreated tie lasts approximately seven and one-half years and the treated tie at least twice as long. The material saving in first cost and replacement through use of the treated tie is obvious. Only one-third of the 120,000,000 ties now used annually are treated, but if all were impregnated with some form of preservative, it is estimated by the Forest Products Bureau that 1,500,000,000 ft. of timber could be saved annually for other uses and that the extent of the saving in the track maintenance cost to the railroads would be millions of dollars annually.

Although the first attempts at tie treatment were made in 1838, work on a commercial scale did not start until about 1885. Since then the demand for the treated tie is increasing, partly because of its recognized superior durability, partly because of the increased costs of replacement, and quite largely because of the decrease in the supply of suitable material available near the roadbed and the necessity for using the less durable species. Few uses of wood illustrate more forcibly the conditions of our timber supply than the fact that where once there was abundant supply of tie material where it was needed, it must now be shipped, sometimes thousands of miles.

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Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

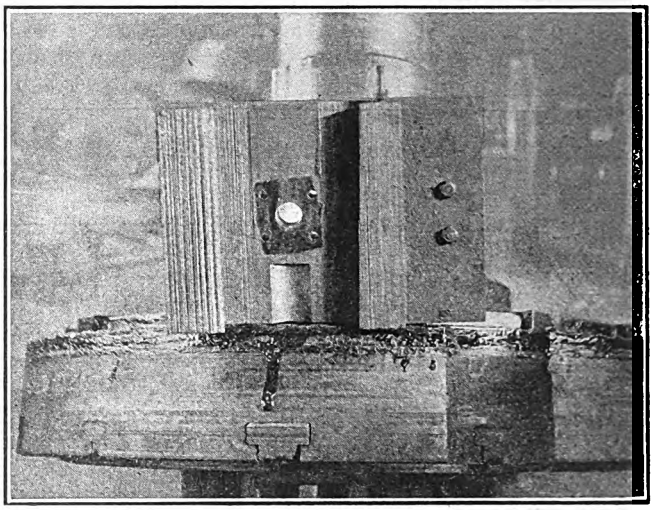
What a $100 Investment Netted

Wheel Lathe Production Doubled by Expending the Above Amount for the Advice of a Machine-Tool Expert and the Repairs Which He Recommended

MANY electric railway shops have wheel-turning lathes which have been installed a good many years. In any particular shop the capacity of a lathe is found to be a given number of pairs of wheels per day and this performance is accepted as the maximum possible from the machine, because it is usually found that any attempt to increase the size of the cut, as is apparently justified by the rugged construction of the machine, makes the tool chatter and the whole foundation vibrate. Such a condition recently existed in the shops of the Northern Ohio Traction & Light Company, Akron, Ohio. Three pairs of wheels per day was the largest number that the operator could turn. Working at this rate the lathe had insufficient capacity to take care of the work involved in the maintenance of the 500 cars operated by the company. Serious consideration was being given to operating the lathe with a night as well as a day shift. However, before this expedient was resorted to, a representative of the Niles-Bement-Pond Company was called in to make an examination with a view to offering suggestions upon the basis of which the lathe performance might be bettered.

The factory demonstrator, after watching the operator turn one pair of wheels, ordered the lathe to be dismantled. The contact surfaces of the tool post carriages were found deeply scored, as shown in the accompanying illustration. This condition, of course, was caused by chips of steel becoming wedged between the carriage and the dovetailed gib. The sliding surface of both carriages was thereupon planed smooth and the carriages replaced. This time, however, means were taken to prevent the recurrence of this trouble. Six pieces of felt were fastened to the edges of both carriages to sweep clean the surface on which the carriage travels.

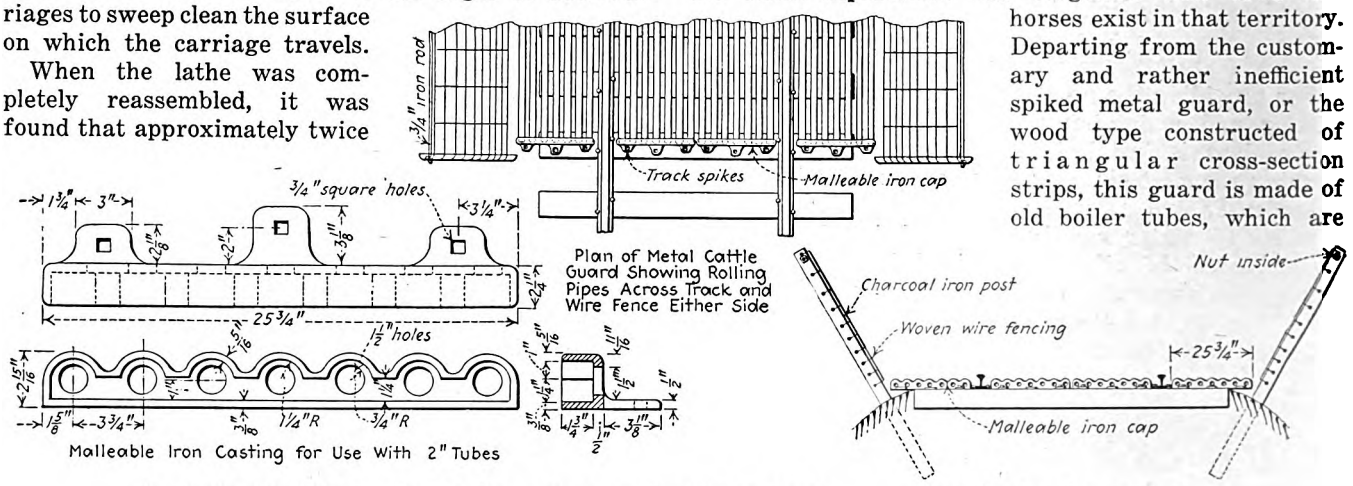
When the lathe was completely reassembled, it was found that approximately twice as heavy a cut could be taken as formerly. Taking this heavier cut, the lathe now has a capacity of seven pairs of wheels per day. Several days time of the factory demonstrator and the labor and material necessary to put the lathe in first-class condition cost about $100. With this more than doubled capacity the same amount of work does not keep the machine running all the time.



THE SCORED SURFACE OF THE CARRIAGE ACCOUNTED FOR THE CHATTERING TOOL

Keeping Stock Off the Track

THE natural trait of an animal to refuse to walk over anything that affords a non-rigid or precarious footing has been utilized by the Scioto Valley Traction Company, Columbus, Ohio, in adopting a metal cattle guard of exceptional effectiveness. In fact, perfection in this respect has been so closely approximated along the 78 miles of its interurban right-of-way that the claim department has forgotten that cows and horses exist in that territory. Departing from the customary and rather inefficient spiked metal guard, or the wood type constructed of triangular cross-section strips, this guard is made of old boiler tubes, which are



EFFECTIVE AND DURABLE CATTLE GUARD MADE OF OLD BOILER TUBES

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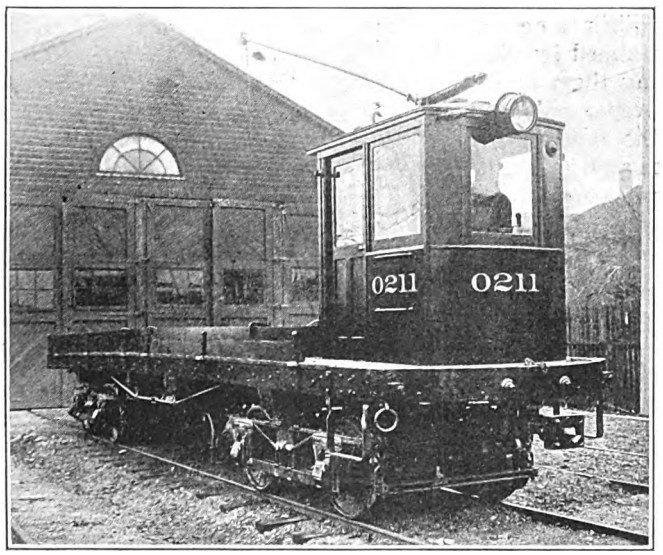
mounted so they will roll when stepped on. Though making the footing uncomfortable, the usual guard is rigid, so that its effectiveness is not all that could be desired.

The end caps of this unique guard, which hold the 2-in. boiler tubes, are made of malleable iron with seven 2½-in. sockets, thus giving the tubes ½ in. of free play. The maximum distance that two tubes can become separated is about 2¼ in., a space which is insufficient to allow an animal's foot to become caught. It is the free rolling motion of each tube as an animal puts the first foot on it that brings into play its instinct to stay off.

The line drawing shows the exact dimensions of the malleable iron end castings, which are the only parts that have to be specially made. The only other work involved is the procuring and cutting to the right length of the old boiler tubes, which are available in large numbers almost anywhere. For protection they are given a coat of weather-proof paint. The installation of these metal guards involves only the spiking of the end caps to the ties. Since the guard is made in sections, for skew crossings each section can be displaced from the preceding one by the amount of the tie spacing. Another feature of this guard is that the length can be readily adjusted by merely cutting off the tube to the desired dimensions. At the sides of the guards, wire wing fences supported with iron posts are used. Maintenance of this type guard costs practically nothing and it is readily removable should the ties or rails need replacement. This metal cattle guard is the invention of Superintendent C. Skinner and it has been patented.

New Motor Flat Car Built by Rochester Railway

THE New York State Railways, Rochester Lines, has recently completed and placed in service a new motor flat car, No. 0211. This car is 37 ft. 2 in. over all and has a width of 7 ft. 7 in. with the side boards



MOTOR FLAT CAR OF NEW YORK STATE RAILWAYS

up and 8 ft. 2 in. when the side boards are down. An operator's cab has been built at one end, which is 4 ft. 6 in. x 6 ft., outside dimensions. All the control equipment, circuit breakers, etc., are located inside the cab. The distance from the rail to the top of the trolley board is 11 ft. ½ in. The sides of the car were reinforced with ¾-in. steel plates, which provide a very substantial construction. The car is fitted with Tomlinson couplers and provision is also made for the use of a bar type coupler, which is necessary with some of the city cars. The car is to be used in connection with construction and maintenance of track and roadway.

Illuminating Fare Boxes

THE problem of providing satisfactory illumination for fare boxes on one-man cars has received considerable attention by the officials of the Hutchinson (Kan.) Interurban Railway. Edwin C. Fearn, master mechanic, has worked out a satisfactory method by connecting a fare box light in series with the headlight. The light is placed in an ordinary tin box, the inside of which is painted white, and a small opening throws the light on the fare box. By connecting the light in series with the headlight, it is possible on dark streets, where few people board the cars, to switch off the fare box light and thus increase the brilliancy of the headlight.

Averaging 150,000 Miles per Pair of Wheels Without Turning

BY A. B. CREELMAN
Master Mechanic Youngstown (Ohio) Municipal Railway

WHEN steel wheels are turned, only the scrap value is received for material which should be worn out and not thrown out. By following a few simple rules, it has been found possible on this system to obtain the full life of wheels without restoring the contour by turning. The cars of this company are equipped with 26-in. steel wheels and, with operation comprising more than 300,000 miles a month, the average life of wheels obtained without turning is 150,000 miles.

The scheme which accounts for this wheel performance begins with the initial mounting of the wheels on the axle. Special care is taken in pairing the wheels to make certain that their tread diameters are exactly the same. This precaution has been found necessary since there is considerable variation in wheels marked with the same diameter as received from the manufacturers. Every axle is tested for trueness and straightened if at all out of line before the wheels are put on. Both the wheel and gear seats on the axle are turned if necessary so that the wheels and gear will have a full bearing. The trucks are carefully squared and all brake rigging put in first-class shape. Brakeshoes are hung so that no side thrust on the trucks will be caused when the brakes are applied. All this work is done when the trucks are in the shop for overhaul.

After a car is in service, the brake rigging is closely watched to see that it is kept in line and that all lost motion is taken up as it develops. Journal brasses are inspected for end play and renewed before the side motion becomes excessive. The axles are kept square in the truck frame by rearranging the shims in the journal box pedestals.

Of course the inspectors are trained to watch the wheel wear very closely as an indication of any faulty truck condition. Wheels that begin to show flange wear on single-end cars are removed from one end of the truck and placed on the other. In this way the wheel wear is balanced so that the same effect is obtained as on double-end cars.

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Until this practice of closely scrutinizing wheel wear and making provision to prevent it was initiated a machinist was kept busy continually turning new flanges on wheels. In the last three years, however, not over a dozen pair of wheels have found their way to the lathe and these had flat spots to be removed.

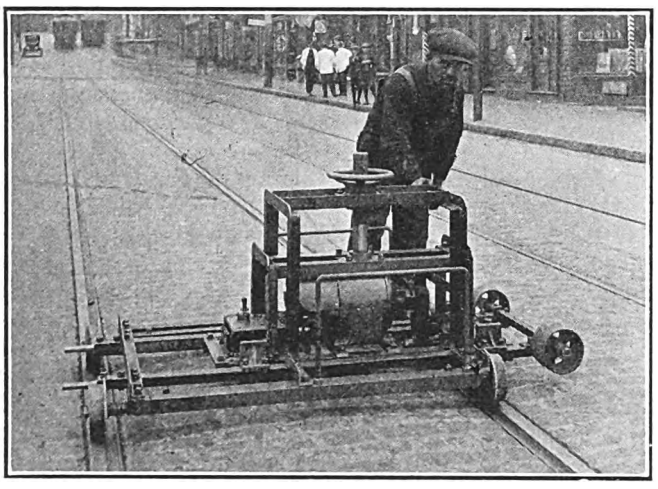
Charlottesville Installs Car Signs to Promote Safety

THE Charlottesville & Albermarle Railway has added a strip of metal about 14 in. long and 3 in. wide to the "Out" door on its cars and has painted these strips red with the word "stop" in white letters. When the operator opens the door this semaphore projects out beyond the car and warns motorists so as to prevent them from running by the car while passengers are being discharged. The sign closes with the door. Destination signs have also been added to the rear of all cars. This was found to be desirable especially on cars where several lines operate over the same track.

What's New from the Manufacturers

Rail Grinder with Derailing Wheels

A NEW type of rail grinder is being placed on the market by the E. P. Seymour Portable Rail Grinder Company of Waltham, Mass. This has been given the name of "Midget" and can be easily and quickly derailed and moved to the side of the track. It has the usual wheels which operate on the rails, but the rail-grinding mechanism is mounted close to one side of the apparatus, which has a third supporting rail. On the same side as the grinder frame is mounted

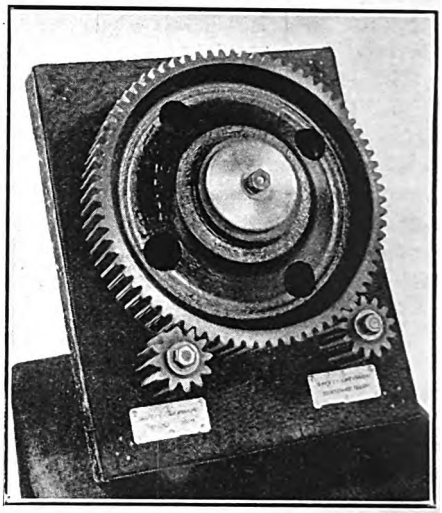


NEW TYPE RAIL GRINDER IN OPERATION

an extension which carries derailing wheels which project beyond the frame of the carriage. On the opposite side of the frame are handles which permit the device to be raised and wheeled off the track in much the same manner as a wheelbarrow is moved about. The carriage holds a rigid movable frame which carries a motor arranged to drive a shaft that operates the emery wheel for grinding.

Special Tooth for Railway Pinions

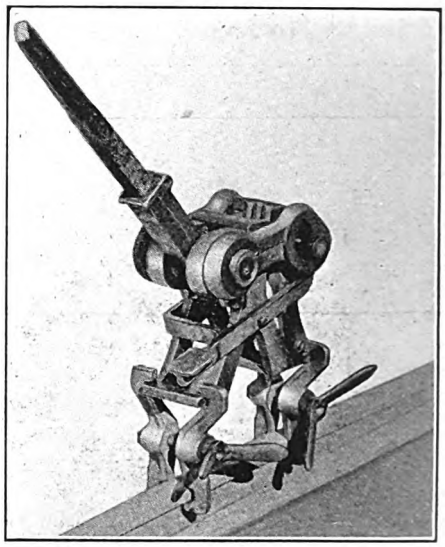
THE Tool Steel Gear & Pinion Company, Cincinnati, Ohio, is introducing a pinion with special teeth. It has been named the "Wisdom Tooth" pinion. As compared with a standard pinion of thirteen teeth the "Wisdom Tooth" pinion has but twelve and is stronger at the root of the tooth. The shape of the twelve-tooth pinion is a true long addendum and it is claimed that this will wear longer than the thirteen-tooth type. The accompanying illustration shows the two types of pinions meshing with a gear. This was exhibited at the recent convention of the Canadian Electric Railway Association.



COMPARISON OF SPECIAL AND STANDARD PINIONS FOR RAILWAY MOTOR OPERATION

Improved Machine for Reclaiming Bent Track Spikes

AN IMPROVED spike shaper was brought out recently by the Werner Machine Company, West Allis, Wis., for the purpose of reclaiming second-hand track spikes at the point where track rehabilitation is in progress. The shaper, which is clamped to the rail, as shown in the accompanying illustration, is light enough so that it can be moved along by the section men as the work progresses. The usable bent and twisted spikes are reclaimed by placing them in the proper groove in the jaws of the machine and pressing them into shape by bearing down on the lever. Should the head of a spike be turned up it is brought back to its original position by a blow with a spike maul. The improved feature of this machine is the slotted link on each side connecting the movable jaw with the eccentric lever pins. After the spike has been straightened and the pressure released the operator then trips the links with a pedal. This action allows the jaw to open sufficiently to let the spike drop through onto the ground. The incorporation of this feature



SPIKE SHAPER WITH JAW RELEASE WHICH ELIMINATES MANUAL REMOVAL OF STRAIGHTENED SPIKES

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accounts for considerable increase in the capacity of the machine as compared with the older type having a fixed link and from which the straightened spikes were extracted by hand.

The shaper itself is made of steel, while the wearing parts are case-hardened and the movable parts are equipped with roller bearings. The grooves of the machine are made for three sizes of spikes: ½ x 5 in., ⅝ x 5½ in. and ⅝ x 6 in. In a test made recently with the improved model, known as the No. 4 Butler spike shaper, the company claims that two men operating the machine eight hours per day straightened 3,840 spikes, or twelve kegs, at a total cost of $6.40, which amounts to about 55 cents per keg.

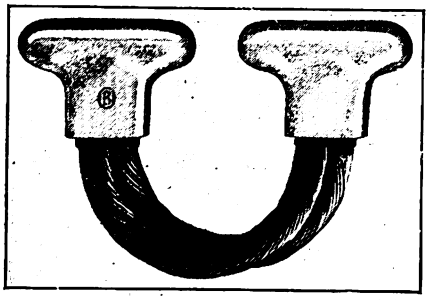
Combined Strain Insulator and Sign

COMBINATION CAR STOP SIGN AND STRAIN INSULATOR

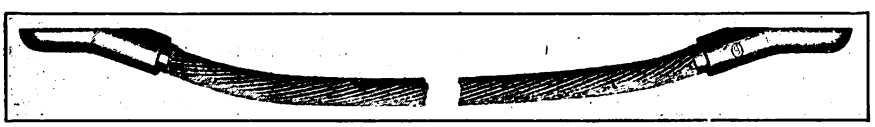
A COMBINATION strain insulator and sign is being manufactured and distributed by the American Porcelain Company, East Liverpool, Ohio. This insulator is intended for the replacement of the iron, enamel or wooden signs which are commonly used by electric railways and attached to span wires. The porcelain sign is made of the same material as are electrical insulators. The sign lettering is fired under the glaze, which makes the part acidproof and insures long life. This type of insulator has been adopted by several of the railways in Ohio as stop signs.

New Arc-Weld Rail Bonds

TWO new rail bonds, for arc-weld application, have been developed by the Ohio Brass Company, Mansfield, Ohio. They are known as Type AW-7 for base of rail application and Type AW-8 for ball of rail.



The AW-8 bond consists of two copper strands formed into a U and welded into steel terminals which, in turn, are welded to the rail. The AW-7 bond is the same in principle. It has a single strand, of any desired length, welded into suitable steel terminals. Steel to steel is the easiest kind of electric welding; the new bonds conform to this principle. The terminals are slightly rounded and provide a wide angle of scarf in which to build the weld. The steel is heavy and will not be burned through by the arc. A copper sleeve surrounding the strands at the terminal shields the wires and absorbs vibration.



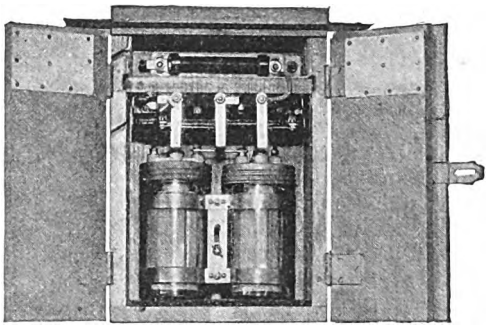
TWO NEW TYPES OF RAIL BONDS

New Type Lightning Arrester

THE Westinghouse Electric & Manufacturing Company has developed a new type of direct-current electrolytic lightning arrester, known as "Type AR," for car or station use on railway, power and lighting circuits. The type "AR" direct-current electrolytic lightning arresters for voltage applications up to 3,800 contain one to twelve cells. Each cell consists of two aluminum plates immersed in a suitable inorganic electrolyte and supported from a porcelain cover clamped by a zinc ring to a glass jar with a gasket placed between the porcelain cover and the glass jar.

Hollow concentric cylinders made from sheet aluminum form the plates, the outer cylinder or plates being punched and upset at frequent intervals in order to allow free circulation of electrolyte within the cell. Balancing resistors are used with arresters of more than one cell. These resistors cause each cell to take its proper portion of the line voltage and thereby tend to keep the aluminum hydroxide films equally formed.

The arresters are "floated" between line and ground so that a leakage current of only a few milliamperes



CAR-MOUNTING FOR DIRECT-CURRENT ELECTROLYTIC LIGHTNING ARRESTER

passes continually. This leakage current serves to keep the film upon the aluminum plate or plates in proper order. The product is capable of passing a surge current of approximately 1,000 amp. at double normal voltage when the arrester is functioning, and one arrester should be used for each 500 kw. of feeder bus, rotary converter or motor-generator capacity to which the arrester is connected. Any voltage in excess of normal line voltage is discharged promptly through the arrester.

The functioning of the "AR" type of arrester is similar to the functioning of a steam safety valve or a hydraulic release valve. When the impressed pressure, or voltage, exceeds the normal, the valve opens and the excess pressure, or voltage, is relieved; then the valve closes and is again ready for operation. A fuse is placed in series with the arrester cells to prevent destruction of the arrester in the event that a short or heavy discharge occurs for an appreciable length of time. Evaporation of the electrolyte in the cells is prevented by a layer of oil on the surface of the electrolyte. The arresters are mounted and securely held in asbestos board and wool-fiber-lined cypress boxes. The boxes with a flat top are intended for mounting beneath the car and with a slanting top for station, car interior, car roof or outdoor mounting on any vertical flat surface. Although all arresters are inherently outdoor arresters, they can be used satisfactorily indoors.

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Electrification from the Railroad Point of View*

The Steam Railroad Man Sees Numerous Obstacles in the Way of Changing from Steam to Electric Motive Power, but Is Becoming Convinced that There Is a Field for the Change

BY CALVERT TOWNLEY
Assistant to the President, Westinghouse Electric & Manufacturing Company

WHEN we electrical engineers have discussed railroad transportation we have always done it from the standpoint of proving how desirable it is for the steam railroads to electrify. It occurred to me that it might be worth while for an electrical man to say a few words about the railroad man's natural objections to electrification. Having enjoyed for many years an association with a large railroad system I have had an opportunity to learn something of the railroad man's point of view from the inside.

In the first place, electrification is very expensive. It involves not a small but a tremendous addition to the investment per mile, with the consequent difficulties not only of earning additional interest charges but also those of financing. The day has gone by when the management of a railroad property can have a free hand in issuing securities. Through various governmental agencies the public has established a strict supervision over railroad earnings, is reluctant to permit the capitalization of values created by earning power and is prone to regard railroad securities as having so stable a value that their yield must be limited to a minimum annual interest with little opportunity for the stockholders of the road to obtain large profits from courage and initiative.

The art of estimating in advance the cost of new construction has never reached or even approached perfection; therefore, where such large expenditures as those necessitated by electrification are contemplated it is always possible, due to this fact and due to unforeseen contingent expenses, that the estimated costs will be considerably exceeded. This contingency, combined with the possibility that increased profits might result in rate reductions, may well cause the responsible executives to go slow.

ELECTRIFICATION SUBORDINATES GRADE LIMITATIONS

Electrification upsets some of the fundamentals around which steam railroad practice has been built up, namely, it practically substitutes an unlimited for a limited motive power. This fact is so fundamental and so far reaching in effect that it will bear frequent restating and emphasizing. Due to the large excess in power-house capacity over any possible demands of an individual train, to the characteristic of electric motors to continue to exert more and more power even to the point of self-destruction and, further, to the possibility of operating two or more electric locomotives together in absolute synchronism with one crew and the consequent possibility of getting any desired weight on the drivers, there is practically no limit to the amount of tractive effort that may be utilized for any one train.

Thus, the long-established practice of calling 2 per cent the maximum grade over which a desired schedule can be made goes into the discard and much steeper grades become entirely practicable; likewise the tonnage and speed of freight trains, previously limited by the power of a steam locomotive to pull, are no longer so limited. Freight trains may be as long as the structural strength of the freight cars will permit or as may be handled in the yards and on the sidings. Schedule speeds may be increased to any point considered safe for the track and equipment, being no longer limited by the steaming power of the locomotive. Instead of accelerating from standstill at the rate of ¼ m.p.h.p.s. as is common steam locomotive practice, passenger trains may be accelerated at the rate of 1 to 1½ m.p.h. p.s.

DEPARTMENTAL AND LABOR CONSIDERATIONS

However, to secure all possible benefits from electrification requires the co-operative effort of the construction, operating and the traffic departments. It disturbs the existing order to a considerable extent and redistributes the proportionate burden of expense among the different departments concerned, so that any departmental head may be faced with the necessity of taking on some additional burden in his own department without any compensating advantage, *i.e.*, the advantage goes to another department. In view of the well-established relationship between departments railroad executives cannot be blamed if they regard such innovations with skepticism and retain a considerable reluctance toward their adoption.

The relation between railroad management and railroad labor is a source of continued and great anxiety. There has grown up an inflexibility in both the duties and the pay of railroad labor unparalleled in any other industry. Changes in operating methods are very difficult. Now electrification immediately requires a lot of changes. Not only have the engine drivers all to be educated to a new art but the duties of the fireman are revolutionized. In fact, except as a source of insurance against the death or disability of the engineer while driving his engine, the fireman is not needed at all.

New types of men, the electrical lineman and the electrical shop man, are required, and where a railroad operates its own power houses the power-house crews are introduced. The transmission lines overlap two or more divisions of the road and confuse the duties of the division superintendents. The signal system has to be revamped. These and other features all tend to upset the existing order of relationship between the management and its labor, and the official whose duty it is to regulate these relations may be forgiven if he contemplates with extreme alarm the task presented to him.

On top of this come all the questions of the actual virtue of electrification itself. It is perfectly true that all electrifications heretofore made have been successful and that no road which has electrified would now consent to return to previous conditions. However, not more than about 1 per cent of the entire steam railroad mileage of the United States has been electrified as yet, and the average railroad executive may be excused if he looks upon the existing examples as special cases and therefore as proving nothing with respect to his own particular problem. However, the attitude of mind of the railroad man has materially changed so that the question always first asked some years ago, "Can it be done?" has now been replaced by the entirely different question, "Will it pay?"

I have been and still am a consistent and an enthusiastic advocate of steam road electrification. In reciting the different objections of which I have spoken I do not intend in any way to indicate a change of opinion or a weakening of confidence, but rather because I think it helpful to us all when we can look at any situation from the other man's point of view, and because I firmly believe we can do the cause of electrification no greater harm than to ignore plain facts and out of well-meaning but mistaken zeal advocate electrification where we are not reasonably sure that it will be economically right.

*Abstract of address before Connecticut Section, American Institute of Electrical Engineers, New Haven, May 23, 1922.

Colors for Traffic Signals

Efforts Being Made to Secure Standardization of Signals—Scope of the Work Defined

A CONFERENCE of representatives of a large number of national associations, manufacturers and public authorities interested in traffic signals was held in New York on May 23 under the auspices of the American Engineering Standards Committee. The national organizations represented included the American Railway Association, American Electric Railway Association, American Automobile Association, American Society for Municipal Improvements, American Society of Safety Engineers, Motor Truck Association, National Association of Mutual Casualty Companies, State Highway Officials and National Safety Council. The United States Bureau of Standards and Department of Labor, with the States of Connecticut, Delaware, Maryland, New Jersey and New York, and several cities also sent delegates.

After the meeting had been called

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to order by A. W. Whitney, chairman of the American Engineering Standards Committee, A. H. Rudd, chief signal engineer of the Pennsylvania Railroad, on behalf of the American Railway Association, presented a paper in which he summarized the general facts of the situation affecting the steam railroads and suggested lines along which they would like to see standardization progress. He said that while signal systems of different railroads differ in some respects, fundamentals are largely standardized. For the operation of trains these include: red for danger (stop); yellow for caution and green for clear. The use of yellow for tail lights of automobiles and of green for fire exits was suggested as steps toward national uniformity. The importance of educating public opinion was emphasized by statistics of railway accidents. The movement for national uniformity should include extensive work with bodies and officers having legal jurisdiction, and should be coupled with a widespread and long-continued campaign of popular education.

A paper by H. B. Flowers, on behalf of the American Electric Railway Association, was then read by Guy C. Hecker. It said that the standard use for night signals in electric railway practice is: red, stop; yellow, proceed with caution; green, proceed at schedule speed. Blue, purple and white are also used in a restricted way, for conveying special information or for safeguarding special conditions. For day signals, hooded light signals showing the same colors are used, but probably in the majority of cases day signal indications are given by means of semaphore arms. For highway protection at grade crossings, when a train is approaching, a red signal either fixed or moving and either steady or flashing is sometimes used, frequently augmented by moving arms, siren horns or by bell signals and the like. Electric railway operators take the view that red should be retained for automobile tail lights instead of changing to yellow as has been suggested. National uniformity in the use of colors was considered most desirable.

Speaking on behalf of the Conference of Motor Vehicle Administrators, A. L. McMurtry said that the administrators felt that they should make no technical recommendations to the conference, but that they were greatly interested in the work and would fully co-operate, provided the recommendations do not entail undue hardships on any interests. If major changes are to be made, such, for example, as a change in the color of tail lights for automobiles, it would take at least two or three years to get such changes into operation, since legislation would be required in some states.

R. J. Durley, secretary of the Canadian Engineering Standards Association, said that the association hoped, as a result of the work of this meeting, to be able to initiate a committee or conference in Canada to arrive as far as possible at conclusions in substantial uniformity with those in the United States.

After a discussion the conference decided that national uniformity in the use of colors for signals was desirable and that the drafting of general recommendations should be taken up by a technical or sectional committee under the auspices of the American Engineering Standards Committee. The scope of the work was defined as follows:

The use of colored lights on all highway vehicles.

Their use on all signals along highways and at curbs, both permanent and temporary.

Their use for highway crossing signals for steam and electric railways.

A co-ordinated relation of color, form, position and number of signals.

A co-ordinated relation to systems of flashing, moving or other similar lights.

Colors for non-luminous as distinguished from luminous signals.

Recommendations on the use of colors for emergency exit signals.

Methods of specifying or defining colors for signal purposes.

Any other closely related matters which, in the opinion of the sectional committee, form a part of the subject to be considered.

Electricity at Rome

Topic an Important Subject of Discussion at the Recent Meeting of the International Railway Congress in Italy

THE subject of electric traction formed Part IV of Section 2 (Locomotive Rolling Stock) of discussion at the ninth Congress of the International Railway Association, held in Rome from April 18 to April 28. The United States was honored by the fact that George Gibbs, chief engineer of electric traction, Long Island Railroad, was president of Section 2. The vice-presidents of Section 2 were Paul Dubois of the Orleans Railway, France; Van Loenen Martinet, Holland Government Railways, and A. Floor of the Danish State Railways.

Mr. Gibbs also presented a paper on the status of electric traction in America. This paper was one of seven on the subject of electric traction, the others relating to the situation in Holland and Great Britain, Belgium, Denmark, Sweden and Norway, Italy, Switzerland, and other countries. Abstracts of these papers have appeared in earlier issues of the ELECTRIC RAILWAY JOURNAL.

These various papers were made the subject of a review by Ernest Gerard of the Belgian Government Railways department, who summed up the situation as set forth by them in a series of four conclusions. The first of these conclusions was that the question no longer was which was the best system, but rather under what circumstances should each system have preference. The second was that international standardization of system is not of great importance because of the ease with which locomotives may be changed at the frontiers of different countries. The third was that, admitting the second statement, much the same condition prevails in the case of two neighboring districts, one having much water power and the other fairly flat. The fourth conclusion of Mr. Gerard was in favor of some standard international bases by which performance of locomotives in different countries can be compared. The discussion at the Congress was largely upon this series of recommendations.

In general the delegates approved the first, and a representative from the Italian government declared that it was much more important to standardize couplings and drawbars than to standardize on an electrical system. He defended the great variety of electric

LENGTHS IN KILOMETERS OF ELECTRIFIED STEAM RAILWAYS*

	Direct Current at Low Voltage 600 to 850 Volts Kilometers		Direct Current at High Voltage 1,200 to 3,000 Volts Kilometers		Three-Phase Current at 3,000 Volts Except (c) and (j) Kilometers		Single-Phase Current 6,000 to 16,000 Volts Kilometers	
	Double Track	Single Track	Double Track	Single Track	Double Track	Single Track	Double Track	Single Track
Europe								
France	167	.....	31(a)	.....	.....	.....	24(b)	.....
Spain	.....	.....	55	.....	22(c)	.....	.....	.....
Great Britain	131	283	43	82	.....	.....	65	.....
" " dominions, Australia	.....	.....	240	.....	.....	.....	.....	.....
Italy	60	130	61	.....	350	720	142	.....
Holland	.....	.....	.....	.....	.....	.....	35	72
Scandinavia	.....	.....	.....	.....	.....	.....	46(d)	.....
Switzerland	33(e)	.....	.....	.....	132(f)	.....	613(g)	.....
Germany	.....	.....	.....	.....	.....	.....	498(h)	.....
Austria and Hungary	.....	.....	.....	.....	.....	.....	141(i)	.....
America								
United States	471	1,392	1,371	2,079	10(j)	.....	500	1,949
Canada	.....	.....	15	37	.....	.....	.....	.....
Brazil	.....	.....	47	122	.....	.....	.....	.....
Chile	.....	.....	24	38	.....	.....	.....	.....
Japan	.....	.....	30	.....	.....	.....	.....	.....
Total	862		1,917		514		2,114	

The grand total shows 5,407 km. of double track, which amounts to about 11,000 to 12,000 km. of single track.

* Does not include tramways or interurban railways, the greater part of which were electrically equipped when constructed.

(a) 2 x 1,200 on two bridges.

(b) In addition, Cannes to Grasse, the current is changed to d.c. on the locomotive.

(c) 5,200 volts.

(d) In addition, 90 km. under construction.

(e) In addition 979 km. of secondary lines.

(f) In addition, 46 km. of secondary lines.

(g) Of which 222 km. are narrow gage, Rhaetian Railway.

(h) Half of which is in operation.

(i) Of which 91 km. are narrow gage.

(j) About 6,000 volts.

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systems in Italy. A representative from France, however, took the opposite view, and explained that a standard electrical system had been adopted for the conversion of French railroads. A British delegate declared that one of the most important factors in the decision was the question of inductive interference by the railroad current with neighboring telegraph and telephone wires. In England the government has the right to carry these wires along the railroad right-of-way. The delegate from Switzerland, where single phase is used, said that in many cases the public telegraph and telephone wires had been removed from the vicinity of the electrified track, but in other cases this could not be done.

In regard to current collection, the double trolley, the single catenary and the simple suspension were all reported as giving good results, though for fast trains and heavy traffic catenary suspension seemed the only method likely to be satisfactory.

The following resolutions were adopted:

"1. The Congress recognizes that it is no more possible now than in the past to recommend any particular system of electric traction as applicable to all cases. There are several systems to choose from, all of which have proved their value under the severest operating conditions, but the Congress recognizes that these systems are all susceptible of considerable further improvement.

"2. The Congress agrees on the uselessness of standardizing the nature of the current in the contact wire on account of the ease with which locomotives may be changed at the frontier of different countries.

"3. It is to be desired that the methods used for collecting and publishing the statistical data concerning electric traction be well defined and standardized. With this object Section 2 expresses a wish that a special committee of the association be intrusted with the working out of a program dealing with each point in detail so that in the future comparisons may be made by means of entirely comparable figures."

A table of the electrified steam railways in different countries compiled by Ernest Gerard of the Belgian Government Railway department and presented is reproduced on page 975.

Lighter Rolling Stock Favored at Engineers' Meeting

RAILROAD men and automotive engineers got together at a meeting of the Metropolitan Section, Society of Automotive Engineers, held on May 25 in New York. Addresses were given by Roy V. Wright, managing editor of *Railway Age;* W. L. Bean of the New York, New Haven & Hartford Railroad, and by L. G. Plant, associate editor of *Railway Review.* Mr. Wright recalled previous developments of self-propelled cars for rail service and wondered if the present activity was not the crest perhaps of a wave which might fall away in the near future. He called attention to the difficulties of putting rail cars on a production basis. Larger car units than now available will be required, and the development of these is limited by the mechanical transmission. Wind resistance must also be studied more carefully, and it will be necessary to watch carefully the safety requirements incorporated in many state laws. Finally, Mr. Wright said that the rail car must be sold to the public, both as regards riding qualities and general appearance.

The present vehicles, according to W. L. Bean of the N. Y., N. H. & H. Railroad, are a good beginning but they should be designed to eliminate vibration, to drift at less than full engine speed on long down grades, and to give greater quietness and passenger comfort without any loss in the present economy and reliability. The underframe can be lightened in later construction. The only trips lost by the equipment now being tried on the New Haven road were due to airbrake trouble.

R. B. Abbott of the Philadelphia & Reading Railway said that his road was studying types in order to determine the one best fitted for the service, and that after this had been decided upon a car to be tried out would be picked from the desirable types. The operating conditions on this road require motor and trailer or trailers, and control from either end.

G. C. Hecker of the American Electric Railway Association said that the public could be educated to the use of the rail car, just as it had been to the light-weight cars now applied successfully on electric local and interurban lines.

As an automotive engineer A. J. Scaife of the White Company protested against the demand for heavy-weight cars. Rail cars should not be called upon to stand collisions which practically destroy the heaviest locomotives. He also objected to the demand for cars of large capacities when most of the traffic was light. Two cars should be used for rush-hour service under such conditions.

Another speaker claimed that the Master Car Builders' standard resulted in the early development of heavy cars, and that the light cars were a step in the right direction. A detachable power truck that could be taken out for repairs was favored and the solution of the transmission problem by the creation of more flexible internal combustion engines is predicted.

The gasoline-electric car was defended by Henri G. Chatain of the General Electric Company. This type was built when railroad men demanded heavy construction, in spite of the protest of engineers.

Of the old McKeen cars some 150 to 200 are now in use, and about 100 of the G.E., practically all that were ever built, are still in operation, according to Mr. Chatain. One of these recently rounded out 1,000,000 miles of service, and several have covered 600,000 or 700,000 miles. The advantage of the gasoline-electric drive is not alone the flexibility of control, but is even more the possibility of maintaining full load on the engine at different conditions of operation.

American Association News

Nominating Committee Appointed

PRESIDENT ROBERT I. TODD of the American Electric Railway Association has appointed the nominating committee for the year 1922-1923, called for under the present constitution of the association. By the constitution the president has to appoint the committee by July 1 of each year and its report as to officers of the association for the coming year has to be made public thirty days before the convention.

The personnel of the committee follows: Charles L. Henry, Gen. George H. Harries, Thomas Lowry, Edward Dana, H. B. Flowers, B. A. Hegeman, Jr., E. F. Wickwire.

Standardization of Cross Ties

THERE was a meeting of the sectional committee for the standardization of cross ties of the American Engineering Standards Committee in Philadelphia on June 2. The meeting was held at the rooms of the American Society for Testing Materials. The American Electric Railway Association was represented by D. H. Rosell, division engineer of the Public Service Railway, who was present to represent Howard H. George, engineer of maintenance of way of the same company and a member of the sectional committee.

John Foley, representing the American Railway Engineering Association, was chairman of the meeting and Arthur Upson, United States Forest Service, was secretary. The standard specification for cross ties of the American Electric Railway Association was used as a basis for the discussion of the committee and some changes were suggested. At the conclusion of the meeting it was decided that it was probably unnecessary to have any further meetings, as any further modifications could be satisfactorily handled through correspondence.

Claims Association Pamphlet

CECIL G. RICE, president American Electric Railway Claims Association, has in preparation a pamphlet entitled "How a Claim Should Be Adjusted." Its purpose is to point out

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the advantages of efficient and modern methods in the claim department of electric railway companies, and particularly the benefit which companies will derive from having their claims representatives attend and participate in the fall convention. Mr. Rice declares that if 5 per cent of the money now expended for claims on the average electric railway should be intelligently directed toward accident prevention and claims prevention, it would accomplish greater and more lasting results of advantage to all departments than any previous undertaking within the industry. He considers money expended purely for claims is waste, and it should be turned into productive channels.

He also analyzes some of the excuses made for non-participation in and non-attendance at claims conventions, and quotes various prominent electric railway men upon the importance and benefit of attendance at the claims conventions.

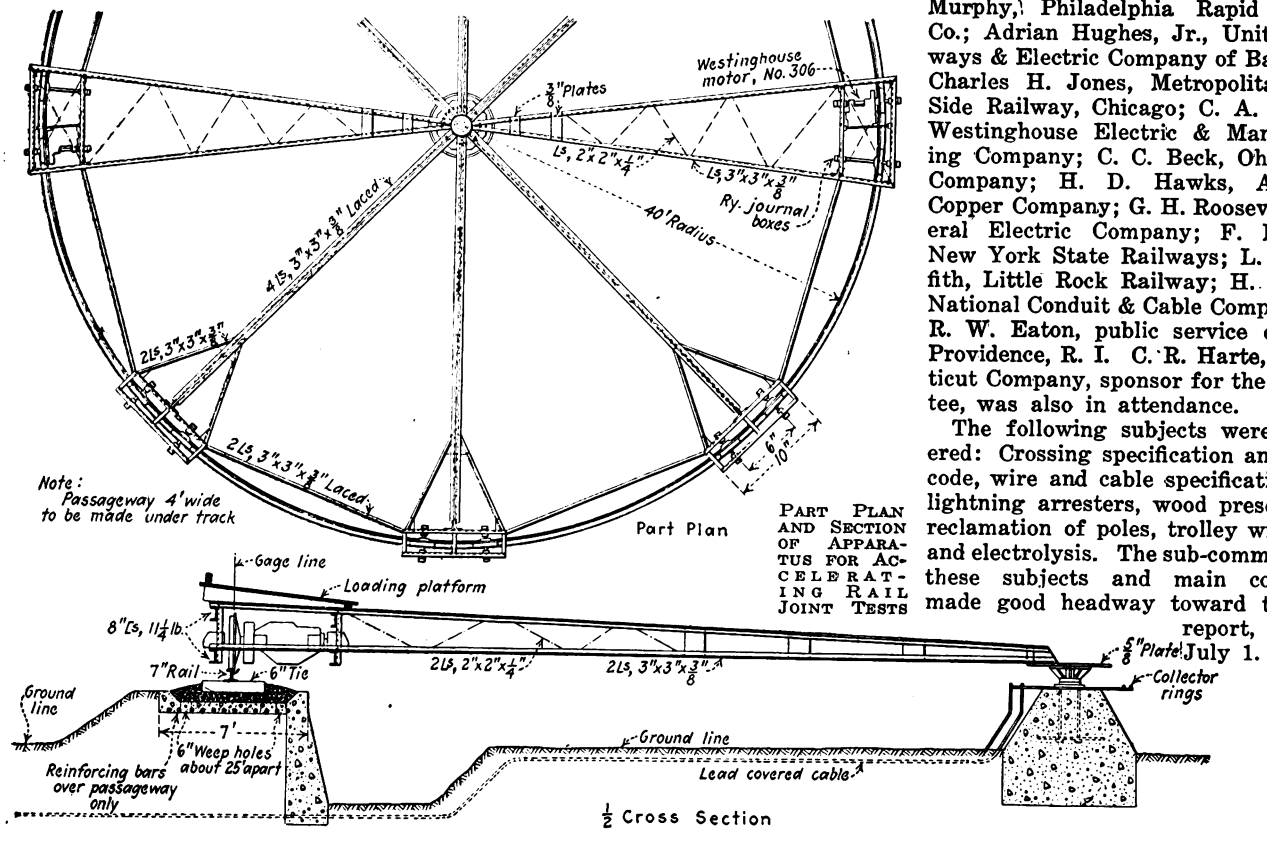
Joint Testing Machine Proposed

A MEETING of the way committee of the American Electric Railway Engineering Association was held in Quebec at the time of the convention of the Canadian Electric Railway Association. It was well attended and a statement will appear later as to the principal conclusions reached. In this issue, however, it is possible to give some particulars of a proposed machine for testing rail joints suggested at the last meeting of the committee by W. W. Wysor, chief engineer of the United Railways & Electric Company of Baltimore and also proposed at the meeting of the committee on welded rail joints which is functioning under the auspices of the American Bureau of Welding. This machine is proposed for subjecting joints to accelerated tests, by passing wheel loads over them in very rapid succession.

In its tentative form the machine consists of a circular monorail track about 80 ft. in diameter, spiked to short wood ties laid on ballast, in turn supported on a substantial concrete foundation which is reinforced where it passes over passageways, mentioned later. The joints to be tested would be those in this monorail. Running on this circular rail it is proposed to have a number of two-axle trucks, say eight, carried at the end of the arms of a wheel-like structure, light in weight, but stiffly braced to insure a tangent relation between the wheel flanges and the rail.

While details of drive are, like other portions of the design, still under discussion, it has been suggested that this be furnished by two railway motors, located at opposite ends of one diameter, the structure being enlarged along this diameter to provide for the motor mounting. Current for these motors would be led to the structure through a pair of collector rings, averaging say 5 ft. in diameter. To provide for loading the axles to such a point as to duplicate operating conditions, a platform would be mounted over each truck for the accommodation of weights.

A simple pivot bearing with wearing plates would be sufficient support at the center of the structure, because the principal weight will be carried by the trucks and the wheel flanges will insure the proper relation of the frame to the circular rail. A passageway 4 ft. wide will give access under the track to the inside.



PART PLAN AND SECTION OF APPARATUS FOR ACCELERATING RAIL JOINT TESTS

Committee on Entertainment

THE committee in charge of the entertainment at the October convention has been appointed and will hold its first meeting in Chicago on June 23, in the office of its chairman, J. V. Sullivan, assistant to the president Chicago Surface Lines, Berland Building. The members of the committee, in addition to Mr. Sullivan, are:

W. H. Beatty, Jr., sales representative Westinghouse Traction Brake Company; J. W. Porter, first vice-president Electric Service Supplies Company; G. T. Seely, vice-president Pennsylvania-Ohio Electric Company; N. G. Symonds, district manager Westinghouse Electric & Manufacturing Company; J. R. Blackhall, general manager Chicago & Joliet Electric Railway; H. J. Kenfield, president Kenfield-Davis Publishing Company; John Benham, vice-president International Register Company; H. L. Monroe, district manager General Electric Company; Harry L. Brown, Western editor ELECTRIC RAILWAY JOURNAL; Martin Schreiber, manager southern division and chief engineer Public Service Railway; E. F. Wickwire, secretary Ohio Brass Company; Thomas Finigan, vice-president American Brake Shoe & Foundry Company; J. H. Alexander, vice-president Cleveland Railway, and E. E. Kretschmer, purchasing agent Chicago & Interurban Traction Co.

Power Distribution

THE meeting of the committee on power distribution of the Engineering Association was held in New York on June 6. Those of the committee in attendance were M. B. Rosevear, chairman, Public Service Railway; F. J. White, the Okonite Company; H. S. Murphy, Philadelphia Rapid Transit Co.; Adrian Hughes, Jr., United Railways & Electric Company of Baltimore; Charles H. Jones, Metropolitan West Side Railway, Chicago; C. A. Butcher, Westinghouse Electric & Manufacturing Company; C. C. Beck, Ohio Brass Company; H. D. Hawks, Anaconda Copper Company; G. H. Roosevelt, General Electric Company; F. McVittie, New York State Railways; L. F. Griffith, Little Rock Railway; H. S. Burd, National Conduit & Cable Company, and R. W. Eaton, public service engineer, Providence, R. I. C. R. Harte, Connecticut Company, sponsor for the committee, was also in attendance.

The following subjects were considered: Crossing specification and safety code, wire and cable specifications, d.c. lightning arresters, wood preservation, reclamation of poles, trolley wire wear and electrolysis. The sub-committees on these subjects and main committee made good headway toward the final report, expected July 1.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Bacharach Hearing Concluded

Home Rule Measure Criticised Severely by Utility Commissioners—Bill Not Likely to Pass

A majority of the members of the committee on the judiciary of the House of Representatives are believed to be opposed to the Bacharach bill. This measure proposes to limit the jurisdiction of the United States district and circuit courts in the matter of granting injunctions from decisions by state and municipal public utilities commissions. The hearings on the bill were closed on June 9, when the opposition completed its presentation of testimony.

Bill Not Likely to Be Legislation of the House

It is understood in well informed legislative circles in Washington that the subcommittee will probably report that the bill will be unconstitutional if enacted and the policy aimed at which would deprive the Federal courts of the right of injunction to prevent property losses pending judicial determination of the validity of orders issued by the state boards would in any effect be bad policy on the part of the government. Owing to the congested state of legislation on the calendars of Congress and the near approach of the periods of recess for the House, it is stated in Washington that it is not probable that the Bacharach bill will be made a part of the program of legislation to be considered at present. Abstracts of recent testimony follow:

Paul P. Haynes, Indianapolis, representing the Interstate Public Service Company of Indiana, appeared in opposition to the bill. Mr. Haynes, formerly a member of the Public Service Commission of Indiana, declared that the men who have had longest experience and who are qualified to present the best thought on the matter are conclusively against the bill. On the other hand, he expressed the opinion that the real intent of the principal proponents of the legislation is to strike down state regulation of public service companies so as to return to home-rule.

In answering Mayor Hylan's contention that the state courts acted more promptly than the United States courts, Mr. Haynes cited numerous examples to prove that the federal courts act with more expedition and declared that this is self-evident to all lawyers. With regard to the situation in Kansas, Mr. Haynes stated that there are many instances in which the Public Service Commission has refused to increase the rate when it had been proved that it was justified. He said that the United States judge in that district had stated time and time again in open court that the Public Service Commission of Kansas has failed wholly to do its duty under the law.

A statement by Carl D. Jackson, chairman of the Public Service Commission of Wisconsin, and president of the National Association of Railway & Utilities Commissioners, was introduced into the record, in which he declared that public utilities boards and commissions should welcome judicial review and interpretation. A letter from J. W. McCardle, chairman of the Public Service Commission of Indiana, was presented to the judiciary committee. In this communication Mr. McCardle said:

> Not only is the Bacharach bill a vicious one from the standpoint of its specific provisions, but it is the character of legislation which, if approved, will break down the constitutional bulwarks which have stood for more than a century and will lead to interminable chaos.
>
> As chairman of the Public Service Commission of Indiana, I desire to say frankly that the Indiana Commission invites a review of its decision by the Federal district courts just as freely as by state courts. If the acts of the Public Service Commission of Indiana are unconstitutional, this fact should be determined as speedily as possible.

The bill also was opposed by Patrick J. Lucey, formerly Attorney General of Illinois. He declared there is no real public demand for this legislation. There is a demand for it, he said, "on the part of certain gentlemen who capitalized the weaknesses of the people. They are seeking this legislation for the purpose of talking for it. It has brought a support to the bill which has given it a bad standing."

Testifies States' Rights Not Involved

Frank S. Carden, representing the Tennessee Power Company, declared in the course of his testimony before the committee that the question involved is not one of states' rights. To pass the measure, he said, meant to deprive citizens of the use of federal courts when their federal rights are involved. He called attention to the fact that while the Tennessee Public Utility Commission had been listed as supporting the bill, the commission itself had telegraphed the judiciary committee that it is not supporting the bill.

Mrs. May Lavelle McDermott, president of the Civic League of New York, appeared for the bill. Among other things, she said:

> We believe in states' rights and home-rule. The utilities should exhaust their remedies in the state courts before they go to the United States Supreme Court. Such corporations have no property rights as such for they only have the privilege granted by the state authorities. Therefore, only the State should have the power to regulate these corporations.

$2,049,597 Accounting Sought

Expert for City Seeks Detailed Accounting for This Sum in Valuation and Rate Case

Delos F. Wilcox has reported to the city of Minneapolis, Minn., upon the expenditures of the Twin City Rapid Transit Company for the period of twenty-two years from 1900 to 1921. As Mr. Wilcox himself explains, the purpose of the report is to account for the sum of approximately $2,049,597 accruing to the Twin City Rapid Transit Company from the earnings of its subsidiary companies during the twenty-two years in excess of the amounts paid out by the company in the form of dividends to its preferred and common stockholders during that period.

Mr. Wilcox reports that the total of money taken by the company from the earnings of the subsidiary companies, 1900 to 1922, is $27,158,977. There was paid out in dividends on preferred and common stock during the same period $25,109,380. This leaves the sum of $2,049,597, the disposition of which Mr. Wilcox is at pains to explain. His report contains details of the entries taken from the books of the company. The question which he asks is, "What has a company alleged to be a mere holding company done with this large amount of money not used in the payment of dividends?"

He regards the books and records of the holding company just as pertinent to the valuation and the rate proceeding now in progress as if the entries appeared in the books and records of the Minneapolis Railway itself.

As a final justification for the inquiry into the books of the holding company Mr. Wilcox makes a statement which is true only in so far as it is susceptible to proof. He says:

> If the Twin City Rapid Transit Company, taking advantage of its absolute and arbitrary power over the activities of the subsidiary companies and of its chosen sole, or financial godmother, spends the surplus in part in foolish ways or in ways inimical to the public interest, instead of paying them out to its own security holders or holding them in it own surplus account, obviously it impairs its own credit and thereby strangles the credit of the subsidiary companies, which can act only through or by the grace of the Twin City company in raising funds for extensions and improvements.

The capital stock of the company is $25,000,000. According to Mr. Wilcox it represents about $10,000,000 of cash paid in. The common stock reached a 5 per cent dividend basis in 1903 and 6 per cent in 1910. In 1918 it dropped to 2 per cent. The dividend paid in 1919 was 2½ per cent, in 1920 3 per cent and in 1921 2 per cent.

Mr. Wilcox has divided his statements of earnings and expenses of the company into three periods—1900 to 1906, 1907 to 1913 and 1914 to 1921. In

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the period from 1900 to 1906 receipts and disbursements, or dividends, were equal to $6,769,700. This is explained, so Mr. Wilcox points out, by the fact that the company carried no surplus account of its own, all of its expenditures being charged as expenses of the subsidiary companies. From 1907 to 1913 the receipts from subsidiaries were $9,862,775 and the dividends $9,359,250, leaving $503,525. In the period from 1914 to 1921 the receipts from subsidiaries were $10,526,501 and the dividends paid $8,980,430, leaving a balance of $1,546,071.

On June 10, the day that the Wilcox report appeared, Horace Lowry, president of the company, said:

We have thrown open to the inspection of Dr. Wilcox and his assistants all of the minutes and account books of all of the companies comprising the Twin City system, and this is all we can do. Dr. Wilcox has intimated that about $2,000,000 of the moneys received by the Twin City Rapid Transit Company from its various subsidiaries has been improperly expended, and this the company emphatically denies.

It is obvious to any thinking person that the various necessary expenditures of the Twin City Rapid Transit Company made from its own funds and not charged to the Minneapolis and St. Paul street railway companies have no bearing whatever on the value of the properties of the Minneapolis company.

The attack on the company apparently is a move to create prejudice just prior to the coming primary election. We are satisfied to rest our case on the books themselves, which are open to Dr. Wilcox, and we will aid by turning over to him all records in our possession, as we have already done in the case of all records he has asked for.

Later he commented as follows:

I have carefully gone over Dr. Wilcox's report on the accounts of the Twin City Rapid Transit Company and after doing so I can see little to add to the statement I made earlier today.

The report deals with the expenses of the holding company, which does not own or operate the Minneapolis Street Railway, and I cannot see that any of these expenses have any bearing on the present proceedings before the Minnesota Railroad & Warehouse Commission. The law provides that the commission shall determine the value of the property of the Minneapolis Street Railway and determine what should be the proper charge for carrying passengers to yield a fair return on said value when determined.

The report of Dr. Wilcox deals with various expenditures of the Twin City Rapid Transit Company over a period of fifteen years and includes all of the holding companies' expenses including taxes, legal expenses, bond discounts, traffic surveys, valuation expenses, officers' salaries and expenses and other items of corporate expense.

All of these matters do not affect the issue of the rate of fare as all of that hinges on the value of the property to be determined, and the report is one which is entirely irrelevant.

The reason for this statement is that all of the money in the treasury of the Twin City Rapid Transit Company is the result of dividends paid to it by the Minneapolis Street Railway, and other companies whose stock it owns, and the fact that the Twin City Rap'd Transit Company paid these expenses has helped the underling companies, as many of these expenses could have been properly charged to the operating company.

City Takes Railway Property

Montevideo, S. A., has taken possession of the electric railway line as a result of a fortnight's strike in which the men demanded more pay from the European companies operating the lines. The city refused to permit an increased rate of fare. The government in a statement said that a settlement could be brought about by the companies paying higher wages but no heavier tariffs would be allowed.

Arbitration Board Cuts Wages Five per Cent

A wage reduction of 5.45 per cent for motormen and conductors employed by the Connecticut Company on all its lines was announced at New Haven, Conn., on June 12 by the arbitration board which has had the subject under consideration. The maximum rate as ordered is cut from 55 to 52 cents an hour. The intermediate rate is fixed at 48 cents and the minimum at 45 cents. The scale for operators of the one-man cars is set at 7 cents an hour above the regular two-man cars. The wages of other employees affected by the arbitration board are reduced 5½ per cent.

The award is signed by Justice John K. Beach of the State Supreme Court and Joseph F. Berry, Hartford, Conn., representing the company on the arbitration board. James H. Vahey, Boston, Mass., representing the men, did not sign the award. He gave out a dissenting opinion in which he said he did not believe the basis used by the arbitrators in rendering their decision on wages was a correct one. After pointing out that he agreed with Justice Beach a year ago in a similar award Attorney Vahey says:

His idea is that last year's award took up the lag in wages created by the increase in the cost of living in 1918-19-20. If last year Justice Beach corrected the irregularities then existing, we ought reasonably to assume that June 1, 1921, was a fair starting point to fix the wages for 1922.

Agreement Reached in New York State

Trolleymen in Rochester, Syracuse and Utica have voted to accept the contract offered to them by James F. Hamilton, president of the New York State Railways, according to an announcement made by John H. Reardon of the general executive board of the street car men. The vote was light in all three cities, according to union officials, indicating a general acceptance of the company's proposition. The agreement provides for the same working conditions which prevailed under the contract that expired on May 1.

By the new terms motormen and conductors of the three cities were given a cut of 3 cents, making the new wage scale 46, 48 and 50 cents an hour, as against 49, 51 and 53 cents last year.

Separate contracts to be drawn in the three cities will provide for joint negotiations. Mechanical men will receive a cut of 2½ cents an hour, which will make the new scale 50 cents an hour.

Employees of the Canandaigua line will receive 45, 48 and 50 cents an hour as against 58 under the old contract, a cut of 8 cents.

On the Rochester and Sodus Bay line the men will receive a maximum scale of 52 cents against 55 cents last year.

On the Rochester and Eastern line the rate will be 52 cents as against 55 cents last year.

Men on the Clinton line out of Utica will receive 52 cents against 55 last year.

On the Oneida line the scale will be 55½ cents against 58 last year.

The situation in Schenectady is to be considered separately and will probably be taken up at an early date. Here the men are working under the terms of the agreement which has lapsed and are now receiving 60 cents an hour, almost 25 per cent more than the minimum wage under the new scale for the other cities.

The Schenectady men are demanding an increase for operators of one-man trolley cars.

New Scale on Philadelphia Rapid Transit Lines

The official statement of the Philadelphia (Pa.) Rapid Transit Company on the new schedule of wages which was referred to briefly in a previous issue of the ELECTRIC RAILWAY JOURNAL is as follows:

The co-operative plan for collective bargaining of the Philadelphia Rapid Transit Company provides as a basis for determining wages the average of the wage scales of the street railway companies in Chicago, Detroit, Cleveland and Buffalo. In conformity with the wage decrease of the Cleveland Railway Company the general committees under the co-operative plan agree as follows:

That the scale of wages of the trainmen of the Philadelphia Rapid Transit Company, effective June 1, 1922, be as follows:

	Rates per Hour—New Men, Cents	After Three Months, Cents	After One Year, Cents
Surface motormen and conductors (operators—one-man cars, 5 cents additional...	57½	60½	62½
Elevated motormen...	60½	63½	65½
Elevated conductors..	57½	60½	62½
Elevated guards.....	57½	59½	60½

That the wage scale of the regular hourly rate employees of the way department be reduced 1 cent per hour, effective June 1, 1922; that the wage scale of the hourly rate employees of the shop and building divisions in the rolling stock and buildings department be reduced 1 cent per hour, effective June 1, 1922.

Other employees are not affected by the Cleveland Railway adjustment.

Will Electrify Sixty-four Miles of Railway

Negotiations for the electrification of approximately sixty-four miles of track now operated by the Missouri Pacific and Union Pacific Railroads in central Kansas are being completed between George Theiss, Jr., president of the Arkansas Valley Interurban Railway, and the heads of the two steam lines involved. This track consists of 30 miles of Missouri Pacific line between Newton, Kan., and McPherson, and 34 miles between McPherson and Salina on the Union Pacific line. Only minor details are yet to be arranged, and electrification is expected to be complete by Jan. 1, 1923, according to plans of the electric railway company. It is planned to operate several passenger cars and at least one freight car daily between Newton and Salina. The new lines will make interurban electric railway connections of practically 94 miles from Wichita to Salina, or 99 miles from Hutchison to Salina.

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Employees Told How to Sell Service

The Eastern Massachusetts Street Railway, Boston, Mass., has adopted a somewhat unique method to improve its service. Through one of its public directors, Fred J. Crowley, and its publicity manager, Fred A. Cummings, it arranged for meetings of its employees for a frank discussion of its relation to the public. At these meetings the officers told the men that they should consider themselves as salesmen who are selling to the public the only commodity that the company has to sell—"service"—and in order to compete with the jitneys and automobiles they would have to make the service so attractive that the public would take it. This they could accomplish by being courteous and amiable and running their cars on time, so that the customers would come to depend upon the service.

On one of the divisions, the cars as a rule would run off schedule, mostly late, until the people were in a habit of thinking of the cars as operating without any fixed schedule. When Mr. Crowley and Mr. Cummings took the matter up with the employees in that division they were informed that it was useless to try to operate the cars on the schedules that were posted; it could not be done. The men were told that if that was the message they wanted to send to the trustees of the company it would be delivered, but with the definite understanding that if these men could not "sell" the service their places would be filled within thirty days by other "salesmen." Then a week of earnest effort followed and now the cars are being operated on time.

In connection with this "salesmanship" campaign, which has just ended, the company has installed headway recorders along the routes to register the progress of the cars. It is as important that a car should adhere to a schedule along the route as it is that it should start on time, for every point is a starting point for some passenger, and the schedule is disturbed if the car lags behind at first and then speeds up so as to reach the terminal on time. By means of a contactor on the trolley wire the car registers in a clock-box when it passes that point. It is just like punching a time clock, and is found to be particularly useful in recording the operation of cars at the midway points.

Passes Ordinance Providing Rules for Public Utilities

The City Commissioners of Galveston, Tex., recently passed an ordinance establishing rules and regulations governing public utilities occupying the streets of the city, engaged in furnishing and selling electric light and power to the city, and in the operation of street railways. The ordinance provides for the creation of a depreciation reserve fund which shall be kept as a distinct fund and shall not be paid out in dividends nor for any other purpose than that for which it was created. The ordinance also sets up machinery for investigating and determining the reasonableness of rates and fares, and for changing such rates and fares when deemed advisable.

Wage Scale Renewed

Men and Management at Davenport Succeed in Arranging Settlement Mutually Satisfactory

Possibility of a strike and tie-up of all surface line transportation in the tri-cities in the face of the National Grotto convention at Davenport, Ia., June 25-28, was removed on June 12 when the union operatives agreed to a year's contract by which the present wage scale is kept in force.

The scale is 51, 53, 55 cents an hour and will apply to both the Tri-city Railway of Iowa and Illinois lines. Practically all of the men are operators of more than a year's service, so the current wage will be 55 cents.

In opening negotiations the men asked for 67 cents an hour. They also demanded a joint contract and recognition of their international union. The company proposed a scale of 43 cents an hour and separate contracts with the workmen of the respective lines, with no recognition of the union.

The one-man car question did not come up, the men being apparently satisfied with all one-man car operation, which has been in force throughout the tri-cities for several months.

After negotiations extending more than a month the men came down to 60 cents an hour, a figure which the company refused to meet. The company, however, offered 50 cents. The men in mass meeting refused the 50-cent offer.

Arbitration was then suggested, but the railway demanded arbitration in terms of the municipal charters and the men insisting on arbitration in terms of the agreement of the past year. The company officials pointed out that this agreement had in the meantime expired.

In this situation the men presented an ultimatum to the company backed by a strike vote demanding acceptance of the operators' terms within forty-eight hours.

Peace soon followed this strike vote, taken on Sunday, June 4. The union negotiators agreed to present a 55-cent wage offer to their men, under three separate contracts, but recognition of the Amalgamated Association implied. Following approval of this offer by the executive council of the union it was submitted to a vote of the union membership and carried.

For the three separate companies the negotiations were conducted by R. J. Smith, general manager of the Tri-City Railway of Iowa; T. C. Roderick, general manager of the Tri-City Railway of Illinois, and Clark G. Anderson, general manager of the Clinton, Davenport & Muscatine Railway. The contracts are signed with the interurban men and with Division 312 and Division 313 of the international.

Association Seeks to Lower Street Car "Overhead" Costs of Operation

The California Real Estate Association in opening up its drive for an initiative amendment to the State Constitution to relieve the electric railway lines of the State from unfair operating charges, through its secretary has stated that the California electric railway lines are now bankrupt and unable to make needed extensions of service. The 36 systems of the state are, with one or two exceptions, insolvent and have never paid dividends on common stock. They are compelled to pave, light, repair, sweep and sprinkle the streets along which they operate, and these charges prevent them from breaking even. The proposed amendment will give the State Railroad Commission the power to grant franchises. In the opinion of the association the present burdensome conditions of franchises will be eliminated if the amendment is accepted.

Special Transportation Commission Considered

A bill has recently been introduced in Massachusetts for the formation of a special commission to study transportation. This commission is to consist of the chairman of the Public Utilities Commission, the commissioner of Public Works, the commissioner of the Metropolitan District Commission, and two citizens, residents of the Metropolitan Parks district. The members are to be appointed by the Governor and are to be known as the Metropolitan Transportation Commission. This commission is to investigate the transportation service and facilities within the Metropolitan Parks district and such other cities and towns as may be later on determined. The purpose is to co-ordinate the service upon the highways, waterways, railroads and street railways, and to see what, if any, use of existing facilities of carriers of one or more of such methods can and should be made by others. The commission is also to determine the best manner of effecting such co-relationship and what improvements and new facilities should be provided for a conscientious and co-ordinated development of transportation in the district, as well as the relation of such service to the general service rendered by all highways, waterways, railroads and street railways in the state. The bill has been reported upon favorably by the committee on street railways.

New Line Planned.—Following its becoming a city on April 13 Long Beach, N. Y., will have a transit line to replace the present bus service and will connect directly with the Long Island Railroad station and the new automobile bridge. The Mayor recently announced the routing of a gasoline-operated line over 80 lb. rails to be laid in Park Street through the business and residential districts to the Lido Golf Club.

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Financial and Corporate

Twelve Large Companies Compared

Operating Ratio Goes Down for Surface Lines and Up Slightly for Rapid Transit

For several years past the ELECTRIC RAILWAY JOURNAL has presented statistics showing the trend of business on six of the largest surface lines and an equal number of rapid transit properties. It has been of special interest to compare these figures with the results of the electric railway industry as a whole, such as published in this paper for April 29, 1922, page 729, which included an analysis of 103 city properties. While these 103 companies produced gross earnings of $368,000,000, the twelve city properties under consideration here showed total earnings of $318,000,000 and they operated one-ninth of the electric railway track mileage in the United States.

While six of the companies are classed as rapid transit, only three operate elevated or subway lines exclusively, the other three being a combination with surface lines. Each of the twelve companies collected more than $8,000,000 in the last fiscal year and their average receipts exceeded $26,000,000. The prevailing rates of fare varied, three charging 5 cents, two 5 cents with a 2-cent transfer charge, one 6 cents with a 1-cent transfer charge, three 7 cents, one 8 cents and two 10 cents, with a lower ticket rate in some cases.

Gross earnings of the six surface properties showed a gain of 4.5 per cent over the previous year, while operating expenses, including taxes, increased only 0.8 per cent. For the rapid transit companies these increases were 4.5 and 5.4 per cent, respectively. The operating ratio for the surface group averaged 85.08 per cent, as against 87.45 in the previous year, and ranged from 77.09 to 97.96 per cent. The average for the rapid transit group was 77.92 per cent, ranging from 62.88 to 93.51, compared with an average of 77.26 in the preceding twelve months. Taking the three roads which operate only subways or elevated lines the operating ratios averaged 75.9, as against 73.8 in the previous year. The total passengers per mile of single track operated showed a decrease of 9.2 per cent for surface companies and 5 per cent for rapid transit lines. The number of passengers in the former group ranged from 912,110 to 1,928,941 and in the latter from 1,149,928 to 1,472,795. It must be noted, however, that several companies, particularly in the latter class, do not keep track of transfer or free passengers and for that reason the figures shown are low.

Less service was rendered by each car in the past year on surface lines, the annual miles operated per car averaging 35,862, as against 36,565 in the preceding year. On rapid transit lines there was an increase, the figures being 38,557 this year and 38,440 last. Revenue passengers on surface lines decreased 4.1 per cent, but the car mileage was reduced only 1.7 per cent. On rapid transit lines the number of passengers was practically unchanged and there was only a slight reduction in service. The average of car-miles per car-hour on surface lines was not changed from the previous year, while on rapid transit lines there was a decrease of 1.7 per cent. This item used to be considered an index of speed performance, but in recent years car-hours have been so augmented by contract requirements that it no longer is regarded as of much value.

In the above figures, as in the ones given in the table herewith, it must be remembered that five of the companies have a fiscal year ending June 30 while the others more nearly correspond to the calendar year.

The comparison corresponding to this for last year may be found in the ELECTRIC RAILWAY JOURNAL for June 4 1921, page 1053.

STATISTICS PER CAR-MILE AND PER CAR-HOUR, AVERAGE ON TWELVE LARGE ROADS

	Six Surface Roads			Six Rapid Transit		
	1919	1920	1921	1919	1920	1921
Transportation revenue per car-mile	38.9c	44.7c	47.8c	33.1c	38.0c	40.7c
Expenses and taxes per car-mile	32.5c	37.6c	43.2c	25.9c	30.6c	33.4c
Transportation revenue per car-hour	$3.26	$4.00	$4.03	$4.21	$4.63	$5.21
Expenses and taxes per car-hour	$2.75	$3.37	$3.62	$3.25	$3.70	$4.13
Operating ratio, per cent	83.06	87.45	85.08	74.00	77.26	77.92

Discontinuance of Service Refused

The Public Utilities Commission at Hartford, Conn., has denied the petition of the Connecticut Company for permission to discontinue the interurban trolley lines which serve the cities of Rockville and Hartford, the line for a greater part of the way running over the steam tracks of the New Haven road. The commission ruled that there was need for interurban service, occasioned by the existing inadequacy and insufficiency of the street railway facilities, and also that there was lack of evidence showing that interurban service was non-profitable. This is the second attempt on the part of the Connecticut Company to discontinue this service.

New Property Acquired

Middle West Utilities Company Takes Over the Eastern Wisconsin Electric Company

The Middle West Utilities Company, Chicago, Ill., announces that it has acquired the Eastern Wisconsin Electric Company, which is now serving fifteen communities and one or more public utility services, among which are the cities of Sheboygan and Fond du Lac.

The Eastern Wisconsin Electric Company also furnishes local electric railway service to the cities of Sheboygan, Fond du Lac and Oshkosh and operates interurban electric railways leading out of these three cities. The total population served is estimated at 110,000 and the gross annual revenue of the company exceeds $1,500,000.

Announcement is also made that the Wisconsin Power, Light & Heat Company will undertake to construct a 66,000-volt high tension transmission line extending from Dane through Columbus and Beaver Dam to Fond du Lac, a distance of 75 miles. This line will interconnect the Eastern Wisconsin Electric Company's properties with the subsidiary properties of the Northwest Utilities Company, which is a subsidiary of the Middle West Utilities Company.

The directors of the Middle West Utilities Company have declared a dividend of $1 on the preferred stock of the company, payable on July 15 to stockholders of record June 30. The action taken by the board provides for the payment of the accrued dividend for the three months ended March 15, 1922.

Dividends are being paid in ten-week intervals, instead of three months, and it is the policy to continue this until all accrued dividends have been paid, the fixed dividend payments in the meantime being continued. Under the plan there will be five dividend payments this year.

At a meeting of the directors of the Eastern Wisconsin Electric Company the board was reorganized as follows: Martin J. Insull, Britton I. Budd, M. F. La Croix, R. H. Ellis, G. C. Neff, W. C. Sharp, and Marshall E. Sampsell. The officers elected are as follows: Marshall E. Sampsell, president; Martin J. Insull, vice-president; Douglas Shaw, treasurer; Leroy J. Clark, secretary and assistant treasurer; and J. C. Neff, assistant secretary.

Ten Months' Statement Submitted

The Interborough Rapid Transit Company, New York, N. Y., finished the ten months ended April 30, 1922, with a net corporate deficit of $2,398,091 against $3,807,850 for the corresponding ten months a year ago. Operating revenue was $44,515,525 compared with $45,914,051 for the ten months ended April, 1921. Operating expenses were $26,880,834 against $30,210,327. There was a falling off in the number of revenue passengers which amounted to 19,168,634.

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Commission Denies Abandonment Application

The Railroad Commission of Wisconsin has dismissed the petition of the Bay Shore Street Railway, Green Bay, Wis., to permit the applicant to surrender its indeterminate permits, to cease operating its railroad thereunder, to take up and dispose of its property in the streets and highways and to go out of the street railway business. The commission holds that it is without authority to authorize the surrender of the permits or the taking up and disposal of the property and that the evidence does not justify an order permitting the cessation of operation. The Bay Shore Street Railway owns a line located in part in the city of Green Bay and in part in the town of Preble, about 1§ miles in length, and leading to a bay shore park known as Bay Beach. The line has been operated during the summer months only and up to the past year has been operated by the Wisconsin Public Service Company under contract with the Bay Shore Street Railway. During the summer of 1921 the line was leased by the city of Green Bay and operated under a contract between the city and the Wisconsin Public Service Company.

The company has outstanding 6 per cent bonds to the amount of $15,000, held by A. W. Priest of Appleton, and also outstanding stock to the amount of $11,500, which is also held by Mr. Priest as collateral for a personal loan of like amount to the president of the company.

During the summer of 1921 the contract with the city called for the payment of $1,580 rental for the property plus the taxes, which amounted to $211. The city then contracted with the Wisconsin Public Service Company for the operation of the line. The service was arranged on a transfer basis with the Wisconsin Public Service Company's lines so that the regular fare was charged. It is estimated that during the season 80,000 persons visited the Bay Beach Park.

The commission found that irrespective of whether the property can be made to earn on its capitalization, it will be of greater value as a going concern than it would be if abandoned as contemplated. The commission was unable to see that there would be any advantage to the owners of the property to abandon and any justification of the abandonment of a system that "renders what appears to be a service much needed in the community."

Boston Climbs Steadily

The reserve fund of the Boston (Mass.) Elevated Railway created under Public Control Act now totals $1,171,866.60. In July, 1922, all of this reserve fund in excess of the $1,000,000 required by law will be repaid to the cities and towns that contributed to the loan assessment which made up the deficit of $3,980,151 assessed in 1919. The efforts of the company are now directed toward the repayment to the municipalities of a substantial amount in July.

The reserve fund was exhausted in 1918 and fully restored in April, 1922. May, 1922, will be the first month in the entire three years and ten months of public operation that receipts will exceed cost of service and at the same time the reserve fund be intact.

Liverpool Doing Better

The report of the general manager for the Liverpool Corporation Tramways for the year 1921 gives the following figures for revenue and expenditure: Total revenue, £1,558,907; operating costs (including rentals of leased lines), £1,300,785; gross profit, £258,122; interest, £46,650; surplus for year, £156,685. The total revenue given is an increase of £105,006 over 1920, although there was a decrease in the two years in passengers carried of 47,989,531 or from 220,219,091 to 172,-229,560. This reduction in traffic is attributed, however, largely to the present depression in trade and the coal dispute, and it is believed that when the conditions of trade improve the record of 1920 will at least be reached. The passengers carried in 1921 are an increase of 19½ per cent over 1913, which was the last full year of operation under pre-war conditions.

There have been three increases in fares during the past 2½ years. During 1921, as compared with 1920, there was an increase in wages. The motor omnibuses which were introduced in 1919 and 1920 to assist the depleted cars to carry the vast numbers of passengers have been withdrawn from the routes on which they were originally installed and now operate only to connect up the outlying suburbs.

Financial Results of Railway Operation in California

Recent reports to the California Railroad Commission show that out of eleven properties six finished the year 1921 with a net corporate loss. The statement of earnings in the accompanying table includes railway operation in Stockton, Visalia, Santa Cruz, Bakersfield, Fresno, Lodi, Sacramento, Oakland, Glendale, Calistoga, Ortega and San Jose for 1921.

Court Affirms Right to Tax on Gross Receipts

The New Jersey Supreme Court, in an opinion by Justice Trenchard, has upheld the constitutionality of the act passed by the Legislature in 1919 providing for the taxation of gross receipts of utility companies. The case was brought before the reviewing tribunal by the Salem & Pennsgrove Traction Company, operating in Salem County. That company held it was taxed $4,806.22 under this law which it claimed was invalid. Justice Trenchard states that the 1919 law was in the form of a license tax and not a tax on property. The company, in its argument, contended that the act is a violation of the state constitution in that it attempts to tax personal property other than on its true value.

Speaking on the contention of the utility company that the tax authorized by the act is not a franchise tax, but a property tax, the court said:

> We find nothing in the act to sustain this contention. The act discloses a legislative intent to substitute in place of the personal property tax an additional franchise tax, based upon gross receipts for use of the street.

The court said the Legislature is within its province when it exempts certain classes of corporations from personal property taxation and treats them as separate classes.

Defunct Property Sold

The rolling stock, franchises and equipment of the defunct Monmouth County Electric Company, which for many years operated between Long Branch and Red Bank, N. J., and between the latter place and Rumson, were sold in separate parcels at auction on May 31. There was a score or more of purchasers, but no bidders for the property as a whole. The total receipts were $33,000. The road was built twenty-five years ago at a cost of $1,000,000. It went into the receiver's hands six years ago, and last March, because of jitney competition, ceased operations. If the sale is confirmed the tracks will be taken up within the next thirty days and the poles and wires removed. The Atlantic Coast Electric Railway bought the company's rolling stock, the prices ranging from $100 to $500 per car.

CALIFORNIA RAILWAY OPERATION IN 1921

	Operating Revenue	Operating Expenses	Net Operating Revenue	Interest, Rent, Taxes, etc.	Net Corporate Income or Loss	Surplus or Deficit at Beginning of Year	Accumulated Surplus or Deficit at End of Year
Stockton Electric R.R.	$346,596	$283,925	$62,671	$29,672	$37,602	$317,204	$354,835
Visalia Electric R.R.	149,116	117,684	31,432	176,057	144,485*	1,250,758*	1,393,349*
Union Traction Co.	92,944	97,075	4,131*	35,357	39,164*	182,850*	216,113*
Bakersfield & Kern Elec. Ry.	138,452	113,302	25,150	13,215	12,267	43,561	55,497
Fresno Traction Co.	403,865	327,758	76,107	143,155	55,825*	528,241*	584,903*
Central Cal. Traction Co.	637,942	493,691	144,251	122,654	37,325	191,723*	154,304*
San Francisco-Sacramento R.R.	1,169,684	947,498	222,187	130,255	109,183	18,368	6,292*
Glendale-Montrose Ry.	28,895	41,795	12,900*	1,610	14,181*	71,234*	85,493*
San Francisco-Napa & Calistoga Ry.	390,057	241,902	148,155	110,512	42,742	102,664	137,440
Tidewater Southern Ry.	244,942	217,998	26,945	56,586	22,812*	160,516*	249,821*
San Jose R.R.	410,772	332,689	78,083	231,021	151,289*	1,113,825*	1,305,965*

* Deficit.

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Participating Preferred Stock Proposed

The directors of United Light & Railways Company, Grand Rapids, Mich., have approved plans to increase the capital stock of the company from the total present authorized amount of $30,000,000 to a total authorized amount of $50,000,000, to be composed of 500,000 shares of $100 each.

The entire authorized increase of $20,000,000 par value will be classified and known as participating preferred stock. Of this authorized amount, approximately $3,500,000, par value, will be issued on or about July 1, 1922, being sufficient for the conversion of one-half of the present outstanding common stock, share for share. This stock will draw dividends at the rate of 7 per cent annually and be payable in quarterly instalments. The 7 per cent dividend will be cumulative.

A further dividend to the extent of 1 per cent additional shall be declared on the participating preferred stock whenever in any year the common stock of the company shall pay or have declared thereon dividends of 7 per cent or more. The participating preferred stock will be subordinate to the first preferred stock, now outstanding, in its claim on assets and earnings of the company. The participating preferred stock can be called for redemption, in whole or in part, on any dividend date, at the option of the company at 120 per cent of the par amount and all accrued and unpaid dividends thereon.

A special meeting of the stockholders of the company is called to be held at Portland, Maine, on June 30, 1922, to ratify the act of the board of directors and to approve the increase in the authorized capital stock and the classification of it into participating preferred stock.

Canadian Discount Lower, So Railway's Troubles Diminish

Now that the discount on Canadian money has decreased to 2 per cent, the troubles of the Calais (Me.) Street Railway have proportionately decreased. In the days of the war when the discount on Canadian money was as high as 18 per cent, the company placed a discount on Canadian money, although it serves Canadian as well as American territory. The line operates in the Maine towns of Calais and Milltown, and the New Brunswick towns of St. Stephen and Milltown, all four towns being opposite each other on the St. Croix River, which is the boundary line. When the Calais Street Railway placed a discount on Canadian money there were many and vigorous protests from Canadian patrons. But the company was not swerved from its purpose, stating it would lose heavily should no discount be ordered. The headquarters of the company is in Calais, where the Canadian money was not worth par value.

After the war, the discount on the Canadian money started to decrease until a year ago it was 6 per cent. Now it is but 2 per cent and fluctuating lower—usually between 1 and 2 per cent. The company is now taking Canadian money at face value.

Surplus in St. Louis Decreased

The United Railways, St. Louis, Mo., which has been operating under a receivership since April 12, 1919, has reported a net income of $303,045 for the year ended Dec. 31, 1921. This figure represents a decrease of $780,383 over the net income for the year 1920. The consolidated balance sheet as of Dec. 31, last, shows cash amounting to $361,093; and total assets and liabilities of $110,243,240. The condensed income account for 1921 compared with 1920 is as follows:

	1921	1920
Gross operating revenue	$19,658,551	$20,267,729
Operating expenses and depreciation	15,093,219	15,274,806
Net earnings	$4,565,332	$4,992,923
Taxes	1,675,697	1,437,337
Income from operation	$2,889,635	$3,555,586
Other income	216,350	145,856
Gross income	$3,105,985	$3,701,442
Deductions	2,802,940	2,618,014
Surplus	$303,045	$1,083,428

Old Property Ceases to Exist—Merger Effected

The West End Street Railway, Boston, Mass., passed out of existence on June 10, under legislation of 1911 allowing the merger of this company with the Boston Elevated Railway, which has controlled it by a lease since Oct. 1, 1897. The West End company was formed in 1889, and a year later it secured the controlling interest in all the street railway lines then operated in Boston and suburbs, including the Metropolitan, the Highland, the Cambridge, the Middlesex and the South Boston companies, the prime mover in the consolidation being Henry M. Whitney. At that time there were 10,000 horses in the service in Boston, and two years later electrification of the roads began.

In 1897 the West End company was leased to the Boston Elevated under a proposition to build an elevated structure in Boston for rapid transit and placing this rapid transit line and the existing surface lines under the same management. At that time the yearly income from street railway service in Boston was $9,000,000 and today it is $30,000,000; the number of revenue passengers was 181,000,000 and today this is 350,000,000. The entire system is operated today by public trustees, with Edward Dana as general manager.

Under the consolidation that terminates the West End Street Railway its stock becomes first and second preferred stock of the Boston Elevated Railway, maintaining the same relative position that it held under the lease.

West Penn Purchases Traction Lines

The West Penn Traction & Water Power Company, Pittsburgh, Pa., made an offer on May 5 to the holders of the common stock of the Monongahela Power & Railway Company for the purchase of their holdings, the offer being contingent upon the delivery of a sufficient amount of the common stock of the Monongahela Power & Railway Company to vest control of the latter company in the West Penn Traction & Water Power Company. It was provided that delivery of the stock should be made at a depository in New York. Information is at hand that more than enough of the stock has been deposited in accordance with the offer to assure the consummation of the deal.

The operation of the Monongahela Power & Railway Company will be continued as heretofore, with general offices in Fairmont, W. Va. It is planned at an early date to connect the power transmission lines of the Monongahela Power & Railway Company with those of the West Penn interests and, as soon as sufficiently substantial interconnections can be made, to operate the two electric power systems in common.

Prior to making this offer the West Penn System had been extended southward into West Virginia by the purchase through the West Virginia and Maryland Power Company, one of the subsidiaries of the West Penn Railways Company, of the electric plants at Grafton, Kingwood, and Elkins, W. Va. The territory served by these properties lies contiguous to that of the Monongahela Power & Railway Company and plans are now being made to consolidate electrically these properties and intervening territory in one power transmission system.

Advantage of Readjustment Plan Emphasized

The protective committee, headed by Grayson M. P. Murphy, representing the Interborough-Metropolitan 4½ per cent bonds, issued a statement recently pointing out the advantage that will accrue to holders of these bonds through their exercising the first of the three options under the Interborough Rapid Transit Company and Manhattan Railway readjustment plan. The period within which holders of the 4½s may deposit them under the plan of readjustment expired on June 14 last, and the period within which holders of certificates of deposit may excerise their election to purchase new Interborough ten-year 6-per cent gold notes under the plan expired on the same date.

The Interborough-Metropolitan 4½ per cent bonds are an issue of the old holding company and are secured by the deposit of stock of the Interborough Rapid Transit Company as collateral. Under the readjustment the Interborough-Metropolitan 4½s will pass out of existence.

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Traffic and Transportation

Ordinance Passed

Jitney Regulatory Ordinance in Richmond Signed—Six-Cent Fare Question to Be Decided

The Common Council of Richmond, Va., on June 5 concurred in the action of the Board of Aldermen by passing the new jitney regulating ordinance and the Mayor signed it on June 8. The ordinance will become effective on June 24.

The ordinance provides five routes, over which 515 jitneys may operate. These routes take care of demands in South Richmond, Church Hill, Fulton and the "fan" district in the West End. The South Richmond routes cover practically the same territory over which the jitneys now operate.

The "fan" route begins at Ninth and Grace Streets, to Belvidere, to Franklin, to Lombardy, to Hanover, to the Boulevard, to Grove, to Park, to Laurel, to Franklin, to Ninth, to Grace, the point of beginning.

The only deviation from the routes is that permitted at Addison Street, when west-going automobiles may, when loaded, turn at that point, and return downtown. Other deviations may be made on emergencies, when streets may be blocked, or when the Director of Public Safety may determine that the public good may be conserved, such as periods during the State Fair.

No jitney operator may under the ordinance, when using "extended routes," charge more than 25 cents for any one fare. The regular fares fixed by the ordinance are: For the "fan" district, 8 cents; all other routes, 10 cents, except that school children cannot be charged more than 7 cents. Children under 5 years of age are to ride free.

The number of jitneys designated for each route are: "Fan" district, 200; Hull Street, 100; Semmes Avenue, ninety; Church Hill, seventy-five; Fulton and Fulton Hill, fifty.

Each person operating a jitney must procure liability insurance policies in the sum of $5,000 for injuries to one person; $10,000 for two or more persons, and $1,000 for property damages, and must procure license tax receipts of $25 for cars seating five passengers; $35 for cars seating seven passengers, and $50 for eight passengers and over.

The ordinance has also been adopted providing for the advertisement of a continuance of the 6-cent fare on the lines of the Virginia Railway & Power Company. This measure will go before the Mayor within a few days. After he has placed his signature thereon it will be published for ten days and then must be passed on by the joint body of Council and Aldermen.

The existing ordinance providing for the 6-cent fare expires by limitation on July 16. The proposed ordinance extends that right for three months, it being expected that by that time the experts inquiring into the condition of the company will have completed their report upon which a fair basis for charges may be predicated.

Seven-Cent Fare Assured With Formal Injunction Against Six-Cent Rate

The 7-cent fare, with three tickets for 20 cents, became effective on the Chicago Surface Lines on June 15. This was made certain with the formal entry of an injunction order against the 6-cent fare by Judges Evans and Page in the United States District Court on June 9. This was done after Attorneys Sheean and Weber for the companies had accepted the 7-cent arrangement as a condition for having the 6-cent order restrained, the judges having explained that they had no authority to fix rates. The court stated that no determination of the value of rebate slips would be made until after the report of the master prior to the entry of a final order. A significant statement made by Judge Page was to the effect that if it is finally determined that the 6-cent rate would be confiscatory the company could immediately begin charging 8 cents because it has accepted the 7-cent rate under special conditions.

Several conferences have been held between President Henry A. Blair and the union representatives with a view to revising the present contract which calls for a maximum wage of 80 cents. It has been rumored that a 20 per cent reduction is contemplated, effective July 2. When the companies are ready to make an offer the men will vote on the proposition. It has been rumored that a strike will follow any attempted reduction, but the union officials said they had given out no such statements. It is hoped that a peaceable settlement can be made.

Council Reinstates Seven-Cent Fare

As a result of the costly experiment of the 5-cent fare the City Council of Brandon, Manitoba, ordered the Brandon Municipal Railway to return to the 7-cent fare or four tickets for 25 cents. The higher fare had been established last year but on March 1, 1922, the 5-cent fare was re-established for a try-out of three months. The experiment decreased the revenue $1,636 in that period against the revenue in 1921. The Council unhesitatingly ordered the return of the higher fare after it had reviewed the company's statement.

Reduced Fare Plan in Prospect

Newly Elected Mayor of Seattle Working on Fare Problem—Five-Cent Fare Ordinance Introduced

Mayor Edwin J. Brown, who was recently elected, has announced that within ninety days he will have a tangible plan to offer to the Council for the reduction of fares on the Seattle Municipal Railway to 5 cents, the pre-war rate. One of Mayor Brown's most earnest campaign pledges was that if elected he would immediately set about the reduction of fares in Seattle, and he has already attacked the problem and is preparing a plan that will be presented within the time that is stipulated above.

No Rush Measures to Be Taken

In the meantime, a 5-cent fare ordinance has been introduced in the City Council by Councilman C. B. Fitzgerald, carrying a provision that a 5-cent fare shall become effective on Aug. 1, 1922. The ordinance was referred to the city utilities and finance committees. Mayor Brown said that no rush measures were to be taken on this important matter.

The ordinance provides for a 5-cent fare on all lines of the municipal railway within the city limits, with a 2-cent charge for transfers. Certain cross-town and short-haul lines are exempted from the transfer charge. An additional charge of 5 cents would be made to passengers riding beyond the city limits on the city's Lake Burien line. Mr. Fitzgerald introduced the ordinance in order that there might be some basis on which to work toward fare reduction, he states.

Mr. Brown took office on June 1. In his inaugural address, he intimated that any reduction in fare must necessarily come through revision of the contract of purchase with the Stone & Webster interests. The retiring Mayor, Hugh M. Caldwell, said:

> We have contracted to operate the railway at a profit of $833,000, and to turn that sum over to Stone & Webster every year. In 1921, on the 8¼ cent fare, we just about broke even, counting only $20,000 for depreciation. You may jolly yourself into believing that more people will ride at a 5-cent fare, but you must remember that the more people who ride, the greater the expense. You must also remember that the courts have ruled that the fares cannot be reduced at the expense of the taxpayers nor at the expense of the bondholders. I ask you, in the name of common sense, at whose expense are you going to reduce fares? There remain but two ways of reducing fares: reduce wages and service or force a rewriting of the contract of purchase.

Advocates Renewal of Private Jitney Service

Mayor Caldwell said further that reducing wages and service would not be sufficient to make a 5-cent fare possible, and that nothing remained but to revise the contract, "to squeeze out more than $7,000,000 of water in the price the city is paying for the system." He also advocated renewal of private jitney service as a means of forcing Stone & Webster to revise the contract.

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Fare Fight Up Again

Unless Dallas Railway Promises to Expend $450,000 in Improvements 5-Cent Fare Will Be Ordered

The fare controversy between the Dallas (Tex.) Railway and city officials of Dallas, which appeared to have been settled some time ago, has again cropped up with the result that the matter may find its way into the Federal Courts unless some agreement is reached soon. The extension of one year for the 6-cent fare privilege will expire on June 27, and at that time the City Commission must act on the proposal to grant a further extension or compel the traction company to revert to operation under a 5-cent fare.

Mayor Aldredge, seemingly backed by members of the City Commission, has proposed that the Dallas Railway raise $450,000 to be spent for betterments and improvements within the next twelve months, and has taken the stand that unless the company raises or pledges this sum before June 28, the 5-cent fare will be ordered effective on and after that date. The Mayor has announced definitely that the city will not consider indefinite extension of the 6-cent fare privilege, and will grant no extension whatever except in return for pledges in regard to improvements.

Officials of the company have replied to Mayor Aldredge's proposal with the declaration that unless the city grants an extension of the 6-cent fare at the time of its expiration on June 27, the company will go into Federal Court and seek an injunction restraining the enforcement of the 5-cent fare and will then make a fight for a 7-cent fare on the ground that any less fare will be confiscatory and inadequate to produce fair returns on the invested capital.

The city is demanding extensions on five lines, new paving on three others and the taking over of two short lines owned by other interests.

In discussing the city's demands for improvements, which will cost $450,000, Judge W. M. Holland, president of the Dallas Railway, explained that the traction company had on hand for improvements only $111,000, the sum recently returned by the stockholders to whom it had been paid as past-due dividends under the 7 per cent earning provision of the franchise. It would be necessary for the company to borrow the other $340,000, he said, and this would be impossible with the present low earnings and impaired credit of the company. It would be impossible to borrow, he said, even with the 6-cent fare.

Examination of Railway's Books in Progress

Frank C. Perkins, the Socialist commissioner of public affairs of Buffalo, N. Y., is meeting with opposition as a result of his efforts to bring about a return of the 5-cent fare on the local lines of the International Railway in Buffalo. Corporation Counsel William S. Rann has advised the City Council to wait until the Public Service Commission audits the books of the International before it adopts the recommendation of Commissioner Perkins, and other members of the City Council are inclined to agree with him.

The municipal authorities now have an application before the state utilities board to set aside the 7-cent fare. As part of that proceeding the commission has granted permission for an examination of the books of the railway company. This examination is now in progress. At the time the 7-cent fare became effective, it was done on the assumed valuation of the company's city properties at $18,000,000. The company now claims a valuation of $40,000,000.

Another Pass in Effect

As a means of stimulating riding and to overcome jitney competition, the Stark Electric Company, Alliance, Ohio, has adopted the plan of issuing a weekly pass for $1. The scheme went into effect on June 4. H. W. Witherspoon, general manager of the company, plans to test the idea out for a period of four weeks.

A 7-cent fare or sixteen tickets for a dollar had been the rate charged by the company, but receipts have been constantly dwindling.

Recently the fare on the buses was cut from 6 cents a ride to 5 cents or twenty-five tickets for a dollar. The railway then countered with the $1 weekly pass, good for any member of a family.

The reduction in fare by the railway has been met with another reduction by the J. B. Cox Bus Company, which operates the city buses. That company has issued a pass for which it charges 75 cents. This may also be used by any member of a family as often as desired.

Indiana Roads to Reduce Rates

An average reduction of 10 per cent in the freight rates on interurban lines running into the city of Fort Wayne, Ind., will probably go into effect within the month, with the Indiana Service Corporation taking the lead. This is the announcement made by S. W. Greenland, general manager.

Revised tariff schedules are now being prepared as ordered by a recent ruling of the Interstate Commerce Commission for steam railroads and permission is now being sought from the Public Service Commission to enable the local interurban interests to file the revised rates on one day's notice.

Fort Wayne shippers having freight consignments for Lafayette, Bluffton and Lima will benefit by the cut as these are the lines under the direct control of the Indiana Service Corporation. Interurban freight rates have always been lower than steam roads and the proposed reduction will correspond to the cut the steam roads are to make on July 1, by order of the Interstate Commerce Commission.

Litigation Over Fare in Little Rock Ends

Difficulties between the city of Little Rock, Ark., and the Little Rock Railway & Electric Company were ended recently when an order was entered in the United States District Court dismissing the case of the railway versus the city in regard to an ordinance prohibiting a change in fares. The company had asked for a temporary injunction to prohibit the city from enforcing an ordinance repealing one of May, 1920, permitting a 6-cent fare.

By the terms of the original ordinance, the company was permitted to increase the fare from 5 to 6 cents, the increase to be effective for one year from the date of passage. Upon the expiration of the period named an ordinance was passed by the City Council repealing the increased fare ordinance. An order for a temporary injunction was sought by the railway to prevent the enforcement of the ordinance

The Council, however, took steps recently to repeal the second ordinance, thereby removing the cause of the litigation. Judge Trieber's order has dismissed the case at the cost of the railway company.

Galveston Attorney Objects to Items Charged to Operating Expenses

Controversy between the City Commission of Galveston, Tex., and the Galveston Electric Company over fixing fares in Galveston appears imminent and there is no indication that the issues may be adjusted soon. In the statement by officials of the traction company recently submitted to the commission showing the company's operating expenses, several items were objected to by City Attorney Anderson and it was then declared that such items could not be properly included in the operating expenses for fare-making purposes.

The company claims the present 5-cent fare is confiscatory and is petitioning the City Commission for authority to increase the fare. C. L. Sayre of the firm of Ernst & Ernst, public accountants of Houston, has been employed to make an audit of the company's books and report on the company's operating expenses and earnings. Mr. Sayre's report will cover the fiscal year of 1921 and the first three months of the present fiscal year.

It developed at a hearing before the City Commission that the item of federal income taxes is being included as operating expenses. City Attorney Anderson declared such items were disallowed by the court in its former action. Mr. Anderson also called attention to the fact that the present report showed $115,607 for maintenance, whereas the court heretofore held $70,000 annually as adequate for maintenance. An item of $11,036 under the head of rate litigation was also objected to, Mr. Anderson asserting it had been thrown out by the court.

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Personal Mention

Railway President Addresses Rotarians

Preston S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, Ga., addressed the International Convention of Rotary Clubs at Los Angeles, Cal., on June 8, 1922. He declared that the specter of governmental control, destroying initiative and enterprise, restricting usefulness, and in the end killing private ownership and operation, will hover over private and corporate enterprise until service is made the basis of all business.

Mr. Arkwright's subject was "Business—The Rotarians' Opportunity to Serve Society." His appeal was for a broadening of the interest of every business man, looking toward the general end of complete understanding and the resultant fairness that must be the rule in all business dealings.

"Abuses of business," he declared, "must be corrected by the men engaged in business themselves. Failure to do this will result inevitably in correction of these abuses by compulsion through governmental restrictions. Governmental interference," he pointed out, "is the paramount threat to the business world of America today."

In support of his contention he cited the history of the American railroads in recent years. "Regulation once begun became progressively more restrictive. The rates of the railroads were fixed, their earnings limited, their services specified, their operating conditions prescribed, the wages of the employees prescribed. Duties and responsibilities were imposed upon them, while the opportunity to meet the increased difficulties through enterprise, initiative and business management was taken away. As an inevitable consequence, expansion and improvement of railroads ceased, service deteriorated, operation became more expensive, freight and passenger rates became higher and the whole country with all its industries and all its business is suffering from want of railroads in new territory, from the abandonment and taking up of railroads already built, from inadequate and insufficient equipment and from high rates and charges. A repetition of the history of the railroads is occurring in the public utilities, in the meat packing and coal industries. The same peril extends to all other lines of privately conducted business.

In concluding, Mr. Arkwright pointed out the duty of the business man not to center his entire interests on his own particular affairs. He said that no matter how sound and intelligent the practice of one concern in a particular line may be, if a considerable number of others in the same industry engage in unfair practices, all who are engaged in the industry are going to suffer too.

R. J. Irvine Leads Southern Club

President of Company in Jackson, Tex., Elected Head of Southwestern Electrical and Gas Association

Below the Mason-Dixon line lives Ralph J. Irvine, newly elected president of the Southwestern Electrical and Gas Association. From Jacksonville, Tex., where he is president of the Jacksonville Light & Ice Company, Mr. Irvine will broadcast his strengthening policies and carry on the important work of the association.

To follow Mr. Irvine's career means to deal with a vital period of development in the history of many important electric plants in Missouri and Texas. For Mr. Irvine's work has been extensive; he has whipped his work in shape in short order and passed on to the next job in line. When one can do that one can soon have a creditably extensive career.

R. J. IRVINE

It was in 1900, as superintendent of the construction department for the Marshall Light, Heat & Power Company, Marshall, Mo., that Mr. Irvine stepped into the public utility field, but his engineering experience quickly won for him the position as chief engineer. In 1906 he was appointed president and general manager of the National Light, Heat & Power Company, which purchased the property of the Marshall Light, Heat & Power Company and the Marshall Gas Company.

After five years with this enlarged company, Mr. Irvine became vice-president and general manager of the Moberly Light & Power Company, which means to those allowed behind the scenes that he reconstructed the electric and gas plants of the Moberly company. With that accomplished, and with the company well on its successful way, Mr. Irvine was transferred by the Inter-State Electric Corporation in 1915 to San Angelo, Tex., as vice-president and general manager of the San Angelo Water, Light & Power Company. But that position is not all he held at that time, for he was simultaneously president of the Winters Light & Power Company and the Ballinger Light & Power Company, and was in control of the operation and construction of the Inter-State Electric Corporation's West Texas interests.

Mr. Irvine and his associates purchased the franchise and assets of the Jacksonville Electric & Ice Company in 1921, after leasing the property during 1920 from the Commonwealth Light & Power Company. This property was destroyed by fire in that year, and since the purchase of the company by Mr. Irvine it has been reconstructed with a 600-kw. electric generating station and electrically driven ice plant.

As president of the Southwestern Electrical and Gas Association Mr. Irvine is continuing a type of work in which he has had previous experience, for in 1911 he was elected president of the Missouri Electric, Gas and Street Railway Association.

E. J. McIlraith Advanced

E. J. McIlraith, recently appointed superintendent of rolling stock and buildings of the Philadelphia (Pa.) Rapid Transit Company, has been with that company since 1919. His first work was in the elevated-subway division. In 1920 he was made operating manager of the division, and in less than a year he was again promoted, becoming superintendent of way. In April of this year he was advanced to the head of the department of rolling stock and buildings. After his graduation from the University of North Dakota, where he received the M. E. degree, Mr. McIlraith spent three years at Cornell as instructor and graduate student in Sibley College. For some time thereafter he was engaged in construction work, and in various branches of city engineering work. For several years before joining the Philadelphia Rapid Transit Company, he was associated with Stone & Webster in Seattle, becoming superintendent of way in 1913. Mr. McIlraith is succeeding R. T. Senter, now special assistant to the president.

Mr. Crone Directs Bureau

Fred W. Crone has been appointed director of the recently organized New York State Committee on Public Utility Information. The bureau will disseminate information in regard to the gas and the electric light and power industries in the Empire State. The electric railways are not at present included in the plan under which the committee in charge will operate. Mr. Crone was a reporter and editorial writer on the New York *Tribune* for fifteen years. For the last three or four years he has been engaged in general publicity work.

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Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Contract Given for Railway Electrification

The Harbor Commission of Vancouver, B.C., has let a contract for the electrification of three miles of railway track on its industrial section in the heart of Vancouver known as Granville Island, to W. W. Fraser, electrical contractor, Vancouver, the cost being $12,000. It is proposed to turn over the tracks when electrified to the British Columbia Electric Railway for operation. Some alterations to the tracks will be required to permit the use of electric locomotives. Granville Island is connected with the British Columbia Electric system but has hitherto been operated by a steam locomotive.

Extension of Electric Railways in London Planned

It is reported that an extensive improvement program is proposed for the extension of electric railways in London, England. The extension of the underground railways is estimated to cost in the neighborhood of £6,000,000. Proposed electrification of parts of the South Eastern & Chatham and London, Brighton & South Coast Railways should make total expenditures of £20,000,000.

G.E. Elects Two New Vice-Presidents

John G. Barry, sales manager of the General Electric Company since 1917, and manager of its railway department for many years, and A. H. Jackson of the law department, were recently elected vice-presidents of the company at a meeting of the board of directors.

Mr. Barry has been connected with the General Electric and Thomson-Houston companies for thirty-two years and is fifty-two years old. He was first employed in the production department of the Thomson-Houston Company in Lynn, in 1890. A year later he was transferred to the construction department of the Boston office and in 1894 entered the railway department at Schenectady, following the organization of the General Electric Company.

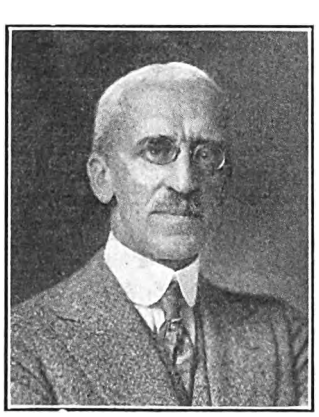
Mr. Barry worked up to the position of assistant manager of this department in three years, and in 1907 was appointed manager, in which position he exerted a marked influence on many aspects of the company's sales problems and policies. His success as manager of the railway department, at that time, and still, one of the most important divisions of the G.E. organization, led to his appointment in 1917 as general sales manager and his present promotion to vice-president.

J. G. BARRY

Mr. Barry is a member of the executive committee of the American Electric Railway Association, being one of the representatives in that committee of the manufacturing members. He is also one of the three members of the association's committee on finance and has always taken a great interest in the affairs of the association.

Mr. Jackson has been head of the law department of the General Electric Company for several years. He was born in Schenectady in 1864 and was educated in the public schools there. In 1886 he was graduated from Union College, and two years later received the degree of LL.B. from the Albany Law School. Mr. Jackson first practiced law with his father, Judge Samuel W. Jackson, and remained with him until 1902, except for three years with the firm of Chanler, Maxwell & Philip in New York.

Mr. Jackson was first employed by the General Electric Company in the law department in December, 1902. He is a member of the University Club of New York, and the Mohawk Club and the Mohawk Golf Club of Schenectady.



A. H. JACKSON

Department of Commerce and Industrial Marketing

Bureaus at Work on Simplifying Practice—How Manufacturers Can Reduce Waste

Speaking at the first National Industrial Advertising Conference of the Associated Advertising Clubs of the World in Milwaukee, on the subject, "What the U. S. Department of Commerce Is Doing to Aid Inter-Industrial Marketing," F. M. Feiker, vice-president of the McGraw-Hill Company, Inc., and formerly personal assistant to the Secretary of Commerce, Herbert Hoover, said, this week:

"Advertising can bring government and business together, because advertising brings business and the public together, and the government's relation to business is after all simply the public's relation to business. Mr. Hoover believes that industry should police itself, and the Department of Commerce has provided an organization through which industry can work in policing itself in constructive measures.

"The Bureau of Census is being developed as a great fact-finding organization for industry, to which individual industries may contribute their information, and from which each industry will receive in return a comprehensive, collective picture of the trend in business and the basic facts as to production, stocks, volume of sales, which get at the heart of intensive merchandising.

"The Bureau of Foreign and Domestic Commerce similarly has been reorganized to become a great medium for the interchange of information and the promotion of our foreign trade. Over 150 foreign trade committees from different associations are working through fifteen or twenty special commodity experts of the Department of Commerce in the extension of foreign trade in different fields of activity, and as a result of this helpful service to industry the inquiries from business men per day at the Department of Commerce have jumped from two or three hundred to over one thousand.

"In a third of the seven great divisions of the Department of Commerce, the Bureau of Standards, a fundamental step has been taken in the elimination of waste in industry, both in production and distribution, by the establishment of a Division of Simplified Practice. This Division of Simplified Practice does not tell industry what it must do to be saved, but reverses the operation and acts as a center point to which committees of industry representing all branches, buyers and sellers and specifiers, may come to discuss the opportunity for the simplification of dimensions and the elimination of excess varieties.

"After less than a year's work this division of the department has already concrete evidence of accomplishment. The paving brick manufacturers have reduced the number of paving bricks by mutual consent between themselves

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and their buyers from sixty-six to five. The lumber manufacturers are discussing the opportunity for simplified nomenclature of lumber and deciding what the size of, for example, a 2 x 4 should be, and a lot of other sensible things.

"The whole program for a better understanding of statistics in industry, the advancement of our foreign trade and its long-time and vital relation to our domestic trade, the elimination of millions of dollars of industrial waste through simplified practice, all are full of copy ideas for advertising both in the field of industrial advertising and in the field of general advertising. If twenty of our largest advertisers would approach their business from the point of view of eliminating waste along the line of simplifying sizes and eliminating excess varieties and then advertise their programs of simplification to the buying public, one of the greatest forces for public education and more intelligent buying would be started. And more intelligent buying will make possible more regular production and cut out seasonal variation.

"It is comparatively easy to get a good idea. It is perfectly simple for a new administration to come into government with a completely new conception of its relation to industry. It is another thing to have industry understand this point of view just as it is another thing to have a great new idea quickly percolate through industry.

"Our national machine for the assimilation of ideas at best is a clumsy one. We have the trade association with its convention. We have the lunch table conference between three or four men. Certain men in public life become at times the unconscious parents of good ideas and help sell them to industry. We have the daily press and the general press, and we have also the great virile force for the education of industry, the industrial press, through whose editorial and advertising pages it is possible to reach in detail groups and classes of men with regard to their particular problems. Most of our advertising up to the present has been built upon some trade situation rather than on some fundamental economic situation. We may not turn all our advertising at once into economic advertising, but we may base all advertising at once on fundamentally sound economics."

Metal, Coal and Material Prices

Metals—New York	June 13, 1922
Copper, electrolytic, cents per lb.	13.812
Copper wire base, cents per lb.	14.75
Lead, cents per lb.	5.75
Zinc, cents per lb.	5.775
Tin, Straits, cents per lb.	31.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$6.375
Somerset mine run, Boston, net tons	3.25
Pittsburgh, mine run, Pittsburgh, net tons	....
Franklin, Ill., screenings, Chicago, net tons	...
Central, Ill., screenings, Chicago, net tons	..
Kansas screenings, Kansas City, net tons	2.85
Materials	
Rubber-covered wire, N. Y. cents per lb.	6.00
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$2.07
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	87.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., cents per gal.	95.00

Large Electrical Shipment

What is said to have been the largest single consignment of electrical apparatus for railroad electrification ever made was shipped this week from the works of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. It represents the first consignment of equipment for the electrification of the Chilean State Railways and consisted of thirty-two cars. Altogether the train was about 1,300 ft. long. The shipment included two complete substation equipments. The thirty-nine locomotives which are included in the order will be shipped later. The shipment will go from East Pittsburgh to the docks of the Baldwin Locomotive Works at Philadelphia, Pa., where it will be loaded on shipboard.

Rolling Stock

Pensacola (Fla.) Electric Company, through Receiver Holtzclaw, has announced that arrangements have been made for buying eight new safety appliance cars for service on the East Hill loop and plans are for the delivery of the cars by Aug. 1.

Virginia Railway & Power Company, Richmond, Va., placed an order on June 10 with J. G. Brill Company for twenty-five new standard safety cars for operation on the lines in Richmond. They will cost approximately $150,000. They have been promised for delivery in about two months' time.

Southern Indiana Gas & Electric Company, Evansville, Ind., on June 3 suffered the destruction by fire of the Water Street carhouse. Included in the equipment totally or partially destroyed were six large double-truck cars, seven single-truck cars and three twelve-bench open cars. Four other cars were slightly damaged. The loss is covered by insurance.

Track and Roadway

Wichita Falls (Tex.) Traction Company has received the approbation of the City Council for the building of a line to serve North Wichita Falls.

Morris County Traction Company, Morristown, N. J., will lay double tracks and roadbed in Madison road in place of the single track. The double track will extend from Sussex Avenue to Cutler Street.

Arkansas Valley Interurban Railway, Wichita, Kan., is starting the installation of about a quarter mile of spur track connecting the line with a rock salt mine which is owned by George Theiss, Jr., president of the railway, and Emerson Carey, salt magnate of Hutchinson.

Springfield (Mass.) Street Railway, through President Clark V. Wood, has declared its purpose to petition for a location of tracks on the Vernon Street and Wight Place loop, in the event that the plan to widen Vernon Street to 80 ft. is adopted by the city. This would take the place of the Court Square loop, petition for which was recently refused by the City Council.

Dayton & Western Traction Company, Dayton, Ohio, has made surveys for the new location of the tracks in New Lebanon. The change will move the tracks several hundred ft. outside of the corporation line and will require a minimum removal of 650 ft. at the closest point. This has been demanded by the village of New Lebanon.

Calais (Me.) Street Railway, according to a proposal, may be extended to Woodland, which is 12 miles up the St. Croix River from Calais. At present Woodland is connected with Calais by a branch line of the Maine Central Railroad, with but two trains per day each way, and also a bus service. Eastport, which is on the coast and 30 miles by road from Calais and St. Stephen, is also desirous for an extension of the trolley line.

Trade Notes

National Advertisers will hold an exhibition on the Million Dollar Pier, Atlantic City, Sept. 8 to 15 inclusive. This exhibition will have as its object the boosting of American industry.

Hardwood Lumber Manufacturers will have a convention at the Henry Watterson Hotel, Louisville, Ky., June 15, 16 and 17. Ways will be considered for providing proper inspection so as to guarantee the quality of lumber and simplify lumber dimensions where possible.

Metal & Thermit Corporation announces that during the first five months of 1922 a total of 8,694 Thermit insert rail joints have been purchased and installed by electric railways. Of these 2,000 were purchased by the Osaka Railway Company of Japan, 1,400 by the Pittsburgh Railways, and 1,200 by the Milwaukee Electric Railway. The remaining 4,094 were distributed among ten other electric railways.

New Advertising Literature

Ohmer Fare Register Company, Dayton, Ohio, has issued a booklet entitled "A Fare Saved." This describes the collecting of fare on an electric railway where Ohmer registers are used.

Drew Electric & Manufacturing Company, Cleveland, Ohio, has published a leaflet describing its protective and reclaiming pole sleeves. These are for use in reclaiming trolley or transmission poles of either wood or steel.

Combustion Engineering Corporation, New York, N. Y., has republished a booklet relative to the powdered coal installation at the River Rouge plant of the Ford Motor Company. This reprint contains some additional information not previously included on operating results at this plant, which has been in operation slightly over a year.

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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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Eliminate the Waste in Railway Service

ALL those who have been following closely the work of the Department of Commerce must become impressed with the emphasis being laid by the department upon the desirability of waste elimination in American industry. Of course, Secretary Hoover's name had become identified with the elimination of waste long before he entered the Department of Commerce. As food controller he urged upon the nation during the war the principle of the "clean plate." Later, as chairman of the Federated Engineering Societies, he initiated the investigation into waste in industry as exemplified in ten key industries, the results of this inquiry being published later in book form. One of the most interesting exhibits at the annual meeting of the Chamber of Commerce of the United States in Washington, D. C., was that of the Commerce Department, showing how efforts were being made to induce various manufacturers to reduce the number of varieties and styles of articles made by them.

The same points have recently been brought out in a number of recent addresses by Secretary Hoover. Thus, during the last week in May, he urged upon the National Lumber Manufacturers' Association the desirability of the standardization of grades, qualities and markings of lumber and the simplification of dimensions and other items that make for economy in production, transportation, distribution, etc., of lumber. Again, in an address to the National Electric Light Association on May 19 he spoke about the benefits which might be secured in the reduction of waste in industry through electric power distribution because of the replacement of a large number of small steam units as well as much manual labor. "The more general spread of electric power," he continued, "is inevitable for this reason if for no other."

The elimination of waste is, after all, the foundation of economical operation in all industry, including the electric railway industry. Even the most able managers admit that much can be done on their properties to obtain more efficient service. If this is true where much time and thought are given to the subject, it must be doubly true on the less efficient properties.

A good starting point is in the matter of speed of cars. Here a study could be made of the time taken for stops to receive and discharge passengers, as well as the causes for all other stops, so as to bring the time of both down to the minimum. Excessive car mileage is another cause of loss. The judicious use of turnbacks is one way by which this source of waste can be brought under control. Another common loss is in poor schedules, resulting in uneven spacing of cars, and waste seat-miles. The schedule maker should constantly study the possibilities in service reduction where cuts can be made without materially discouraging traffic.

Transportation wastes only have so far been discussed, but there are equal opportunities for good work in other departments of most properties. These include the power, shop, accounting, claims and executive departments. An individual and a nation can be thrifty without being parsimonious; so a company can avoid waste without driving away any patronage.

Standardization of Tie Sizes Should Be Encouraged

ELECTRIC railway companies should follow with considerable interest the work of the sectional committee for the standardization of cross ties of the American Engineering Standards Committee, which held its first meeting on June 2 in the rooms of the American Society for Testing Materials at Philadelphia. This committee is composed of representatives of the American Railway Engineering Association, American Electric Railway Engineering Association, American Society of Civil Engineers, American Society for Testing Materials, National Association of Railroad Tie Producers, National Hardwood Lumber Association, National Lumber Manufacturers' Association, United States Department of Commerce, American Wood Preservers' Association, Society of American Foresters, American Mining Congress and the United States Forest Service, so that all the industries most vitally concerned are represented.

At the present time almost every purchaser of ties has his own pet specification, the difference between many of these being so slight as to make no possible practical difference one way or the other. This is known to be true of electric railway properties. Analysis of the situation in the electric railway field shows, for example, that nearly 86 per cent of the total mileage use ties 6 in. in depth and about 77 per cent use ties 8 in. in width. The remainder specify depths and widths greater or less than these. Over 64 per cent of the roads operating standard gage track use ties 8 ft. in length, the remaining 36 per cent specifying lengths varying from 6 ft. 8 in. to 8 ft. 10 in. There may be sufficient reason why one-third of the electric railway companies cannot use ties 8 ft. in length and why 20 per cent cannot use ties cut under a 6-in. x 8-in. specification, but it is difficult to believe that the slight differences in dimensions which now exist in the different specifications will produce any practical difference in the results obtained from the ties in service over those which would be obtained from ties cut under a 6-in. x 8-in. x 8-ft. specification.

The result of this multiplicity of the specifications for railway ties is that it is impossible for the tie producers to cut ties in advance of receiving an order, and then only sufficient to fill that order. Assuming a limited number of standards of ties in use, ties could be cut when other work is slack, orders could be

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anticipated, producers could stock up to a certain extent with a quantity of the different classes of standard ties with the assurance that these ties would meet the requirements of every road for the particular class tie in question, and the result would not only be more prompt delivery to the consumer but a reduction in cost as well.

The sectional committee is using the standard specifications of the A. R. E. A. as a basis for the formulation of a standard specification to cover all requirements for standard gage track. A number of changes are under consideration in the attempt to harmonize the differences of opinion among the committee members and it is hoped that an early agreement will be reached in order that the industry may have the full benefit of the efforts of this committee.

Proposed Investment in Rail-Joint Research Promises Big Returns

THE committee on welded rail joints, which was organized under the auspices of the American Bureau of Welding, is planning to lay a scientific basis for conclusions as to the merits of particular joints and practices. As the rail joint committee, through interlocking membership, is closely allied to the committee on way matters of the Engineering Association, its work may be considered virtually as a part of the activities of the latter. It is highly proper, therefore, that the electric railway industry should furnish financial and moral support to the work of the rail joint committee. The industry will be the chief beneficiary of the results of its researches.

The committee will presumably soon be in the market for funds, a modest sum compared with the savings which should result from the tests which are proposed to be made. Roughly speaking, the total amount asked will be about three-thousandths of 1 per cent of the electric railway income of the country for one year. This amount is so trifling that it will undoubtedly be promptly forthcoming once the plan has been adequately set forth.

Such a contribution as may be requested should not be considered as an assessment, but rather as a share in a co-operative effort to save money for everybody. It is proposed to expend a considerable portion of the money for apparatus for joint testing, notably the machine mentioned in the June 17 issue of this paper. Expenditure for such equipment would be an investment capable of yielding results of permanence for many years to come.

The electric railway industry has done little in the way of co-operative research work involving physical apparatus. The steam railroads have done much in this line, the work of the Master Car Builders' Association and the American Railway Engineering Association being especially noteworthy. Railway engineers, college laboratories and college faculties have been pressed into service, with excellent results. To be sure the electric railways did support the Electric Railway Test Commission, organized in 1904 in collaboration with the Louisiana Purchase Exposition. The commission made a real contribution to the sum of electric railway data. This work, however, was done eighteen years ago, and the undertaking was directed specifically toward capitalizing for the electric railways the effort and expense incurred by manufacturers in assembling their great exhibits at St. Louis. It was a research proposition of a general character; the contributions toward its support had to be made on faith in the men who comprised the commission. The rail-joint program is more specific, the committee giving details in advance of the proposed expenditures. Its successful inauguration would be a credit to the industry.

City Planning a Necessity in Every Community

IT IS unfortunate that those who drew the plans for our cities did not have the gift of foresight, otherwise, in New York, for example, the blocks on Manhattan Island would have been arranged with their longer dimensions north and south instead of east and west. But when the streets in the central part of Manhattan Borough were laid out, there were no rapid transit lines other than the boats on the North and East Rivers and it was probably expected that most of the land traffic would be in an easterly and westerly direction. In consequence, the north and south avenues are so few that they are overburdened with traffic of all kinds, whereas many of the east and west streets, except at their crossings, have excess capacity. In the same way, it could hardly have been expected that any city planning done forty years or more ago would have taken into consideration the increased burden in the way of traffic placed upon the streets by the erection of buildings twelve to twenty stories high.

Regret for past errors is helpful only to the extent that it stimulates action to avoid their repetition. It may be out of the question to alter the arrangement of streets in the downtown sections of our cities, but it is not difficult so to plan for future growth that the same mistakes will not be made again. Intelligent thought on city development and requirements may even mitigate the troubles in the older portions of a city. It is with this purpose undoubtedly in mind that the trustees of the Russell Sage Foundation have appointed a committee to develop a comprehensive regional plan for New York City and its environs, and this committee has begun its work.

Some other cities have been more forehanded in this matter than New York, but in few, if any, has this phase of civic development been given the consideration it deserves. It is a phase in which electric railway companies have a special interest because of the close association between transportation and any intelligent plan for city growth. Too often in the past this vital connection between city development and urban transportation systems has been overlooked and, according to a recent address by Daniel L. Turner, consulting engineer of the New York Transit Commission, the mistake is still being frequently made.

While the problem obviously is more pressing in some cities than in others, no city large enough to support a local railway system can afford to ignore the question, and the earlier it is taken in hand the better. A city does not need to possess a subway to have a traffic congestion problem. It is large enough to engage in remedial measures if automobiles are beginning now to crowd its busiest streets. It may be that the local electric railway officials cannot dictate the method to be followed, because they will be considered to be interested parties, but they can call attention to the need of some action and can advise intelligently as regards any solution.

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Control Equipments for Pacific Electric Railway

Twenty Motor Cars and Ten Trailers Arranged for Operation on Both 600 and 1,200 Volts D. C. Have Recently Been Added—Many New Features Are Included

BY W. M. HUTCHISON
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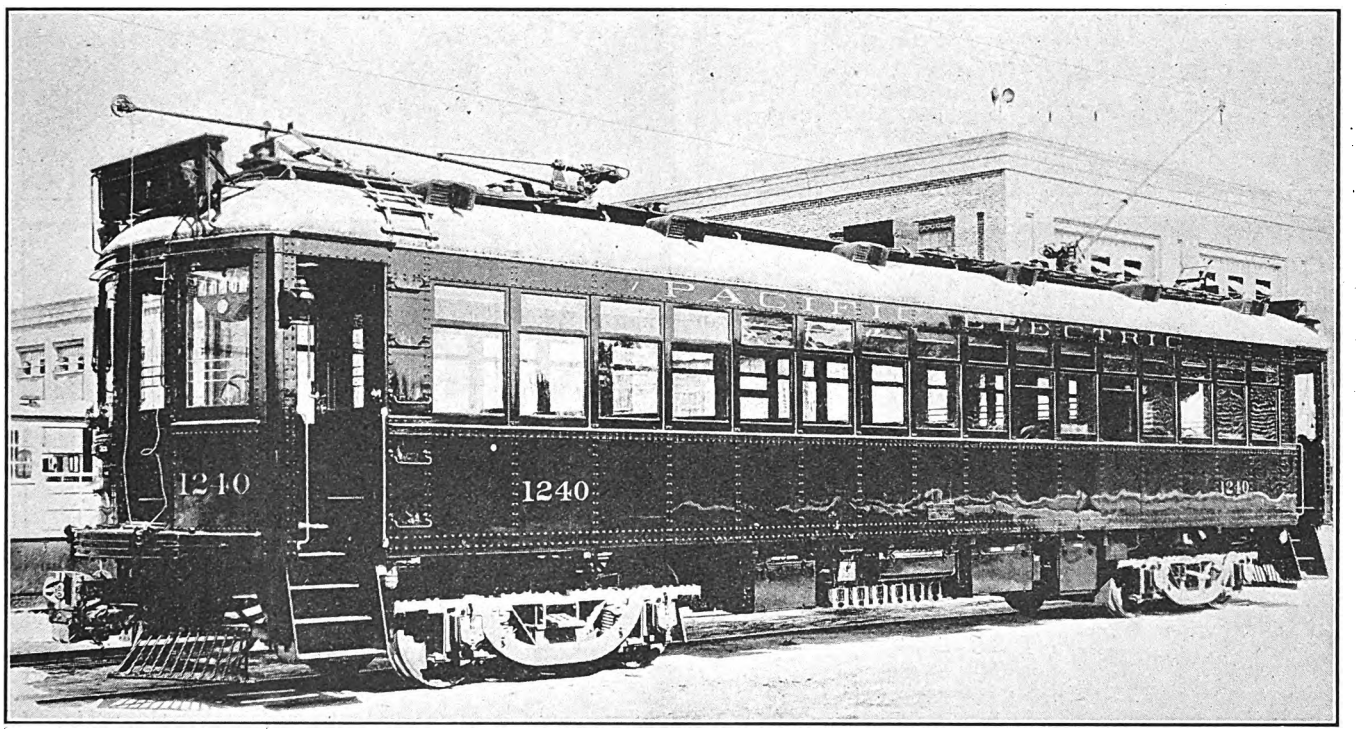

NEW CAR OF PACIFIC ELECTRIC RAILWAY EQUIPPED FOR SERVICE

FROM an interurban railway operating over the 12 miles between Los Angeles and Pasadena, Cal., in 1895, the Pacific Electric Railway has expanded until it is now the largest and most extensive interurban electric railway system in the world, owning and operating approximately 1,100 miles of track in southern California and serving a population of over 1,000,000 people. This railway has contributed probably more than any other factor to the remarkable growth of Los Angeles and all of southern California. In 1920 alone the total number of passengers handled reached 96,290,906, while the freight handled by the company for the same period amounted to 2,717,363 tons.

Consistent with its policy of development and service, this company has recently placed in operation for interurban service between Los Angeles and Long Beach, Cal., twenty new all-steel motor cars and ten all-steel trail cars, equipped with quadruple Westinghouse type 557-D-7 motors and 600-1,200-volt HL control.

The total distance between Los Angeles and Long Beach is 20.37 miles, 4.35 miles of which is through the congested city districts. The schedule provides for a total running time of fifty-one minutes. Trains are normally made up of two motor cars and one trail car; however, the control apparatus has sufficient capacity so that a total of five motor coaches may be operated in the same train.

The cars were built by the Pullman Company and were equipped at the railway company's Torrence Shops. The general dimensions and construction of the trail cars are identical with those of the motor cars. The principal dimensions of the cars are indicated in an accompanying table.

BOX FRAME MOTORS USED

The motor equipment consists of Westinghouse type 557-D-7 motors of the standard box frame type, each rated at 145 hp. at 600 volts and insulated for the maximum potential of 1,200 volts. The main field windings are arranged to secure tapped field connections for the last running notch. Leads are brought out on the axle side and are covered with three-ply rubber hose. Special heat-treated, solid helical gears of forged steel are provided, pressed on an A. E. R. A. standard 6½-in. axle. The gears have fifty-eight teeth and are used with nineteen-tooth pinions.

WEIGHT AND DIMENSIONS OF CARS

Weight of motor cars completely equipped	107,680 lb.
Weight of trail cars completely equipped	78,000 lb.
Seating capacity per car	64
Length over end sills	47 ft. 2 in.
Length over end buffers	58 ft. 1 in.
Width over all at eaves	9 ft. 4¼ in.
Height of car body from running rail to top of roof	13 ft. 1-11/16 in.
Length between truck centers	34 ft. 0 in.
Wheelbase of car	41 ft. 0 in.
Wheelbase of truck	7 ft. 0 in.
Wheel diameter	36 in.
Weight of motors and gears	16,200 lb.
Weight of control equipment	5,200 lb.

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The various auxiliary circuits, while complete, are simple and reliable. Energy for the control and lights is obtained at 600 volts on the 1,200-volt zones from a dynamotor compressor, which also supplies compressed air for the operation of the air brakes and control.

The heater circuits are energized directly from the trolley on both 600 and 1,200-volt zones, contacts being provided on a control changeover switch to establish the proper connections for either voltage. The signal system is operated from a six-cell Edison storage battery. A relay is located in the trolley circuit, which automatically gives the motorman the "stop" signal in case the trolley leaves the wire or if the power supply is interrupted for any other reason.

An auxiliary lighting bus line is provided for supplying energy for the lights and auxiliaries throughout the train. This energy is supplied from the trolley on the 600-volt zones or from the dynamotor on one of the motor cars on the 1,200-volt zone. A special protective relay is provided on each motor car which automatically cuts off the dynamotor from the bus line wire as soon as the latter is energized. This prevents feeding the bus line wire from more than one dynamotor in a train at any time. The control current for each motor car, however, is taken from its own dynamotor.

Details of the Control Equipment

The control equipment selected is arranged for automatic acceleration with full speed operation of the motors on both 600 or 1,200 volts, with provision for field control and for operation in multiple with type "M" control. As previously mentioned, 600-volt energy for operating the control apparatus is secured direct from the 600-volt trolley on 600-volt zones and from the dynamotor compressor on the 1,200-volt zones.

The main motor control consists essentially of twenty-three unit switches of the "HL" electro-pneumatic type, each complete with its magnet valve and operating cylinder. The switches are operated by compressed air taken from the air brake system, the admission of air to the switch cylinders being controlled by the magnet valves. These magnet valves are actuated by low-voltage current tapped from points on a control resistor which is connected between the 600-volt train line and ground.

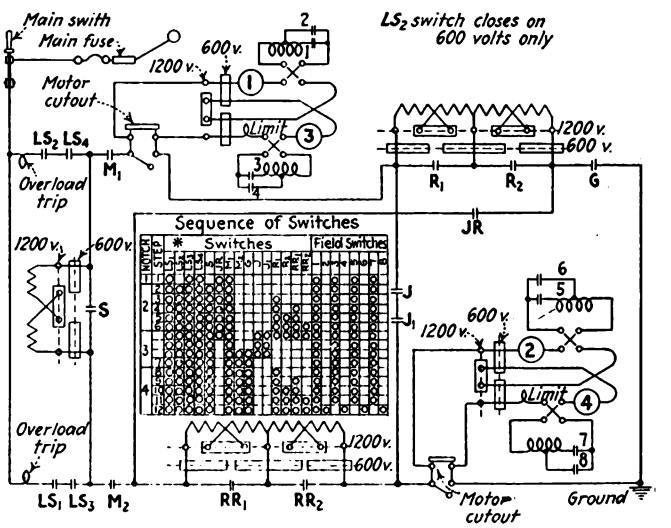
Four of the switches are mounted in a separate frame, together with two overload trip relays, and constitute the line switch. This line switch is especially designed for heavy duty and affords full overload protection as well as serving to open the circuit under normal conditions. The line switch is especially designed for mounting directly on the car body and really consists of a frame within a frame, the internal compartment being insulated from the external by insulated bolts. An especial feature of this line switch is the use of the two overload trip relays, so connected as to afford the same percentage protection on 1,200 volts as is obtained on 600 volts. Referring to the schematic diagram, with the changeover switch in the 1,200-volt position, the LS-2 switch is "locked out," through the control circuits, so that the total motor current passes through only one overload trip coil. In the 600-volt position the motors are connected in parallel pairs instead of in series, but the total current is divided between the two overload trips, so that the circuit is opened at the same current per motor in either case.

Eleven additional switches, mounted together in a common frame, are used to establish the main motor circuit connections and to make the minor changes in the motor circuit required to accelerate the car. In addition, eight unit switches mounted in a separate frame are used to establish short or normal field connections. With these switches and suitable starting resistance there are obtained five accelerating and one running notch in series and four accelerating and two running notches in parallel, the last of which is the short or normal field running position. Transition from the series to the parallel combination is accomplished by the bridging method.

The direction of motion of the car is controlled by an electro-pneumatically operated drum type reverser. It is operated by an air cylinder similar in construction to that employed for the operation of the unit switches.

Automatic Combined Air and Electric Couplers Used

The control is governed by master controllers, one of which is located in the motorman's compartment at each end of the car. Adjacent to the master controller



SCHEMATIC DIAGRAM OF MAIN AND CONTROL CIRCUITS, 600-1,200-VOLT, HL CONTROL

are located the changeover operating switch and a control circuit cut-out switch, including a reset contact for the line switch.

The train line, which extends the whole length of the car, terminates in combined air and electric automatic couplers at either end and is continuous from car to car. To the train line are connected the control circuits to the various pieces of apparatus so that when a control wire is energized by a master controller the corresponding train line wire is energized and all apparatus connected to that particular wire is actuated in unison throughout the train.

The functions of the 600-volt train line wires are relayed to the low voltage unit switch magnet coil circuits by means of two operating relays, designated respectively as the "multiple" and the "progression" relays.

By means of a line relay, the unit switches on each car are operated locally in case of failure of the line voltage, regardless of the position of the master controller. If the master controller is held in an operating position the control will automatically operate when power is restored, the switches closing in the proper

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sequence until reaching the corresponding position of the master controller. Auxiliary contacts are provided on the line relay for operating a buzzer alarm system when the current collector leaves the wire, as previously mentioned.

The operating relays and line relay described above are mounted in a sheet-steel box, for convenience in arranging the apparatus under the car body. This relay box also includes a small "control" relay which is energized by the master controller in the "on" position, and through which the control resistor on each car is energized. With this arrangement a major portion of the control current on each car is supplied from its own dynamotor, rather than from the dynamotor on the car from which the train is being operated.

The various control resistance tubes required are also grouped for convenience in a similar box, arranged for mounting under the car. The length and position of the various tubes are such that tubes of unlike properties cannot be interchanged.

Two master controllers are used, one at each end of the car. They are of the single-drum type, operation in one direction effecting movement of the car forward, and the opposite operation effecting movement of the car in the reverse direction. A small latch is provided, however, which can only be operated with the handle in the "off" position and which "selects" the direction in which the handle is to be moved. This makes it impossible to throw the operating handle directly from a forward to the reverse position, or vice versa, without first pausing on the "off" position and operating the latch.

The controller is so arranged that the operating handle is returned to the "off" position by means of a spring when pressure is released. It also includes in the handle a button which, if released while in any operating position, operates a pilot valve to exhaust the air from one side of the piston of a relay valve, allowing the piston to open a port on its valve, thus exhausting the air from the brake pipe, and applying the emergency brakes. Consequently, release of pressure on the controller handle in any operating position opens the control circuit and applies the air brakes in emergency. A key is provided which locks the master controller handle in the "off" position, making the controller inoperative. The controller has four positions forward, *i.e.*, series switching, full series, parallel switching and full parallel, and two positions reverse, *i.e.*, series switching and full series.

Panelboard Mounting for Switches

At the rear of the motorman's station in the front of each car is located a control panelboard, inclosed in a suitable compartment. On this panelboard are mounted the various knife switches and fuses required in the control, light and heater circuits. The 1,200-volt heater and dynamotor switches are mounted on a separate base with barriers and covers, forming a complete switching cabinet, isolating them from the lower voltage apparatus.

On this panel are also mounted the limit relays which govern the rate of automatic acceleration, the lighting bus relays previously described and a control cut-out switch by means of which the train line may be disconnected from the control apparatus on any car.

The progression of the control is governed by the limit relays as they lift or drop under the action of the main motor current. One relay is provided with a shunt coil, which when energized opposes the flux of the main coil and so increases the relay setting. The control circuits are arranged so that this coil is energized when a pair of motors is cut out, thus permitting the car with a pair of motors out of circuit to accelerate in emergency conditions at practically the same rate as when operating with four motors.

On an interurban railway operating over both 600 and 1,200-volt zones considerable damage may be done if a car or train is run from the low voltage to the high voltage section without first rearranging the main and auxiliary circuit connections by operating the changeover switch that is provided for this purpose. In order to guard against damage under such conditions, a protective relay is used, which operates, when abnormal voltage is applied, to open the auxiliary and control circuits and drop out the main switches. This relay consists essentially of a standard electro-pneumatically operated switch unit and a tripping device similar to the usual form of overload relay except that it employs a voltage coil instead of a series coil, both mounted together with the necessary resistance in a common frame for car mounting.

If a car runs onto a 1,200-volt section with the circuits arranged for 600-volt running 1,200 volts will be applied across the trip coil, which will operate its plunger to open the circuit to the valve magnet coil on the pneumatic switch. This drops out the switch, which disconnects the control and auxiliary circuits from the 1,200-volt source of supply. A contact disk on the trip also opens the circuit to the line switch valve magnet coils. The switch cylinder is provided with an inlet port of reduced size in order to provide a slight time element in closing, so that in case a high voltage is applied when the switch is open the trip coil will function before the switch can close. After the protective relay has operated it is necessary to throw the changeover switch to the correct position and momentarily lower the trolley, when the trip plunger is released and the switch again closes.

Changeover Switch Establishes Connections

An electro-pneumatically operated drum type changeover switch establishes the main, control and auxiliary circuit connections necessary to secure full speed operation of the motors and identical operation of the auxiliaries on both 600 and 1,200 volts. When changing from the high-voltage to the low-voltage position the starting resistance sections are paralleled to produce one-quarter the resistance and the motors are connected in parallel pairs. As the voltage has been reduced to one-half and the resistance to one-quarter of its former value the current through each motor remains the same.

An especial feature of these changeover switches is the method of operation. A combined air and electric changeover operating switch is provided, which in addition to contacts for energizing the proper operating valve of the changeover switch for 600-volt or 1,200-volt operation includes a pneumatic valve connected directly to the operating cylinder. Operation of this switch establishes control circuit connections for operating the changeover switches throughout the train and through the valve throws the changeover switch directly in the car in which it is operated. This makes it possible to operate the changeover switch in the leading car, should a train run onto a 1,200-volt section with the changeover switch in the 600-volt position,

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causing the protective relay, described above, to operate and cut off power. After the changeover switch has reached the 1,200-volt position the protective relay is automatically reset by momentarily lowering the trolley, and control energy is then available for operating the changeover switches electro-pneumatically throughout the rest of the train through the control contacts on the operating switch. Without this feature it would be necessary to operate the changeover switch on the first car by hand after the protective relay had opened the control circuits.

Particular attention has been paid to the problem of assuring continuous service by adequate protection of the equipment under all operating conditions. Some of the outstanding features may be summarized as follows:

(1) The use of a rugged, reliable line switch especially designed for heavy duty on both normal shut off and overload; (2) an arrangement of main circuit apparatus to secure the same degree of overload protection on both 600 and 1,200 volts; (3) the use of separate unit switches to establish normal or short field connections; (4) provision for increasing the accelerating current per motor when one pair of motors is cut out of circuit so that the car accelerates at practically the normal rate; (5) the use of a protective device, to prevent damage due to overvoltage, which is readily reset from the car after the correct connections have been established, and (6) the "dead man's" feature in the master controller which interrupts the power circuit and applies the emergency air brakes in case of man-failure.

In addition, the control includes all the fundamental principles of automatic control and the well-known successful attributes of the electro-pneumatic unit switch system.

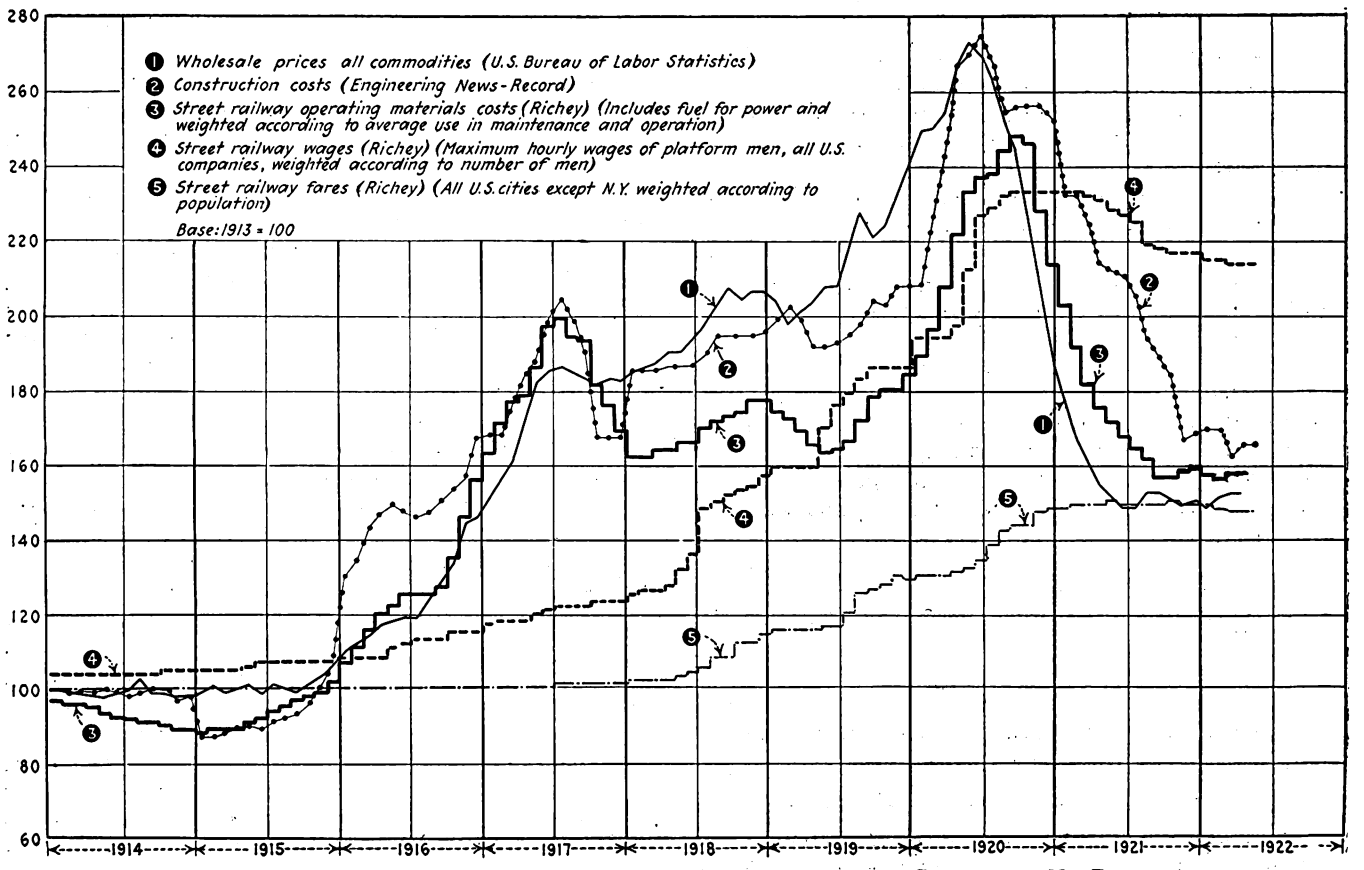
Trend of Prices, Wages and Fares

Chart Shows Variations During Last Ten Years in Wholesale Prices and General Construction Costs and in Electric Railway Material Costs, Wages and Fares — Based on Figures Assembled and Compiled by Albert S. Richey

DURING the past five or six years events principally influenced by the world war have produced most violent changes in price levels. The extreme fluctuations which have been taking place have awakened a wide interest in various "indexes" designed to measure the movements of prices or costs of different sorts of commodities, labor and the like. While the high peaks in such costs appear to have been passed, generally having occurred during the year 1920, interest is now centered on the return of the several indexes to normal, together with a considerable amount of speculation as to just where and when normal conditions are to be reached.

A tabulation of twelve indexes of special interest to electric railway operators, under the heading "Conspectus of Indexes," assembled (and in part compiled) by Albert S. Richey, has been appearing in the Financial and Corporate department of this paper for the past several months. The chart, which is given below, depicts, by a series of lines, the trends of five of these indexes from the beginning of 1914 down to date, each to the scale of its average value during 1913 equaling 100. Three of the indexes shown have to do particularly with electric street railway operation and are those compiled by Mr. Richey, namely, those of operating materials costs, wages and fares. The two others are of more general derivation, namely, construction costs and all commodities.

As numbered on the chart, No. 1 shows the trend of the wholesale prices of all commodities, as compiled by the United States Bureau of Labor Statistics. This



TREND OF PRICES, WAGES AND FARES, BASED ON FIGURES ASSEMBLED AND COMPILED BY MR. RICHEY

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index is made up from average prices on more than 300 commodities, obtained by the bureau monthly from all parts of the country, and weighted according to the estimated quantity of each article marketed. The commodities used are divided into nine classes: Farm products, food, cloths and clothing, fuel and lighting, metals and metal products, lumber and building materials, chemicals and drugs, house furnishing goods and miscellaneous. Since the list of commodities is so comprehensive and the weighting is done so carefully, this index is recognized as authoritative as very accurately portraying the trend of the general price level of all commodities in this country. The sub-indexes relative to the nine general groups listed, also published monthly by the bureau, are equally reliable and are commonly used to indicate the price trends in these general groups.

As indicated by the chart, the all-commodities index varied little from the 1913 level until late in 1915, when an upward trend began; this accelerated rapidly after the middle of 1916, and with but temporary halts increased to the high point of 272 in May, 1920. During the following year the recession was most rapid, reaching 151 in May, 1921. In the past year the variation has not been more than two points on either side of 150.

CONSTRUCTION COSTS

The second index shown in the chart is that of construction costs, as computed by the *Engineering News-Record*, using the elements as follows:

Structural steel in Pittsburgh	37.50 per cent weighting
Cement f.o.b. Chicago	7.14 per cent weighting
3 x 12 to 12 x 12 Southern pine in N. Y.	17.10 per cent weighting
Average price common labor, eighteen to twenty cities	38.00 per cent weighting

As the price movements in these basic materials are similar the country over, and as the labor unit is averaged from the rates in a large number of cities, this index should be closely indicative of general construction costs in the United States. Local costs may be influenced by the prices of brick, sand, gravel, crushed stone and other materials locally produced, but such prices are so affected by local conditions that they have no place in an index which attempts to portray nation-wide trends.

The *News-Record* construction cost index has followed the all-commodities index in general trends. It rose earlier in 1916, and later in 1919-20, but to about the same high peak. It fell more slowly, and four to eight months later, but since November, 1921, has remained close to 165.

It may be of interest to mention here an index of electric railway construction costs which was developed by Robert M. Feustel in connection with a study of costs on the property of the Philadelphia Rapid Transit Company. The index was found to agree very closely with construction costs on that property and was made up of elements as follows:

United States Index, "all commodities"	64.54 per cent weighting
Steel rail	14.76 per cent weighting
Local labor	6.61 per cent weighting
Ingot copper	6.19 per cent weighting
Common brick	7.90 per cent weighting

On the basis of 1913 = 100, the index showed for the Philadelphia property a peak of 252 in May, 1920, and a recession to 151 in December, 1921.

STREET RAILWAY OPERATING MATERIALS

The index of street railway operating materials costs (shown in the chart as No. 3) is compiled by Mr. Richey and is a combination of three of the price indexes of the United States Bureau of Labor Statistics, metals, lumber and fuel. These indexes are weighted in such a manner as to represent the general price level of the materials entering into normal maintenance and operation of the average street railway, including fuel for power.

This index showed a sharp rise to a peak of 199 in July, 1917, then a falling off with fluctuations between 160 and 180 in 1918 and 1919, a rise to the high peak of 247 in September, 1920, a rapid drop to 156 in September, 1921, and finally a fairly steady hold between 156 and 159 for the past eight months.

STREET RAILWAY WAGES

The Richey index of street railway wages (No. 4 on the chart) is compiled by averaging the maximum hourly rates of conductors and motormen of a large number of city and interurban companies, weighting the rates of the various companies on the basis of the number of passenger motor cars operated. The index therefore closely represents the trend of the average wages of United States electric passenger car operators.

The rise in this index was constantly evident, but with two pronounced jumps, one in 1918 and one in 1920, to a maximum of 232 in September, 1921. From 1916 to the latter part of 1921 the wage index was under the all-commodity index, or general price level, both referred to 1913 as a base. However, the recession of the indexes of commodities in general, construction costs and operating materials has not been matched in degree by that of the wage index. Its drop from the high peak of 232 was only to 213 by May of this year—a drop of but 8 per cent.

STREET RAILWAY FARES

The index which stands out on the chart so markedly in its dissimilarity to the others is that of street railway fares. This index is also compiled by Mr. Richey and is the relative average of the street railway fares in all United States cities having a population of 50,000 or more (except New York City), and weighted according to population.

As published monthly in Mr. Richey's "Conspectus," the figures are given in cents and show the 1913 average fare of 4.84 cents remaining almost unchanged until the middle of 1917. A fairly uniform rise, beginning in May, 1918, reached its highest point of 7.24 cents in May, 1921, from which the average has dropped to about 7.14 cents at present. The chart shows this index, for purpose of comparison with the others, in terms of the 1913 base = 100.

In the past year the fare index has been very close to the all-commodity index, and within 10 points of the operating materials index, while the wage index is still 66 points higher than the fare index. In other words, the average citizen is paying 47 per cent more for a car ride than in 1913, almost the same as the increase in the cost of all commodities combined. At present, also, the average car operator is getting 113 per cent more for his work, and materials for operation are costing the railways 57 per cent more. It is well known that the average investor in street railway securities is, as a consequence, getting a diminished return on his investment. Much has been and must be done in the way of economical operation, and some further adjustment must be made in wages before conditions can again be accepted as normal or livable.

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How Resistance Is Used in Railway Automatic Substations

Views of Several Electrical Engineers of Long Experience with Automatic Substations Are Presented on the Question of Using Resistance in the Machine Circuit, or in the Feeder Circuits, or Both

THERE has been a great deal of discussion pro and con about the use of resistance in the machine circuit and in the individual feeder circuits in automatic substations as a means of protecting against overload without cutting off power altogether. To bring together a summary of the experience and opinion on this subject and the practices being followed in the various installations the editors of ELECTRIC RAILWAY JOURNAL invited certain electrical engineers who have had extensive experience with automatic substations to express their ideas and experience for the general advancement of the study. Their views are presented in what follows:

G. G. Post, electrical engineer the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., comments briefly on this problem thus:

"We do not use resistances in the individual feeders and do not believe it is a good plan to do so. We think that as far as possible the station should operate just as it would if it were controlled by an operator and that if anything happens on an individual feeder it should kick out and stay out until the trouble is cleared. Automatic reclosing circuit breakers can be used for this purpose." All of the railway automatic substations in use by the Milwaukee company are in interurban service.

John M. Drabelle, mechanical and electrical engineer Iowa Railway & Light Company, Cedar Rapids, Iowa, is of the following opinion:

"The arrangements of resistances in an automatic substation depend entirely upon the operating conditions and circuit layout involved. No hard and fast rule can be laid down. I believe for interurban service a single bank of resistance in the machine circuit is the proper way of handling the load, but for city service the resistances should be in the individual feeders. It seems to me that it is up to the engineer on the job to do some good, careful work and study out his problem rather than to depend on a cut and dried, or more or less arbitrary, arrangement of resistance."

E. J. Nash, electrical engineer Butte (Mont.) Electric Railway, responds to the question with these thoughts:

"The operating conditions in themselves govern whether it is advisable to use the load-limiting resistances in the feeder or machine circuits. Where the station feeds three separate sections, as does the automatic station of the Butte Electric Railway, it is preferable that the resistance be in the feeder and machine circuits. Whatever resistance is in the machine circuit may be omitted from each of the feeder circuits. The resistance in the machine circuit, which is inserted between the converter and the trolley when an overload occurs on any one section, does not cut the voltage down sufficiently to overload any of the other stations. But this resistance, together with the resistance in the feeder circuits, prevents an overload upon the automatic machine even with one of its feeder trolleys grounded. In consequence, by proper setting of the thermostat, the feeder circuits will be opened by a continued overload and yet the station will still feed the remaining sections."

E. H. Scofield, engineer of power Twin City Rapid Transit Company, Minneapolis, Minn., has reached the following conclusions as a result of his experience:

"Where only a single unit is employed, we consider it best to place the resistance in the main machine circuit rather than in the individual feeder circuits. The main argument for this is that the purpose of the resistance is to protect the machine from overload, rather than to reduce the overload sent out on any individual feeder. This plan of using the resistance in the main circuit results in supplying a relatively higher voltage to the overloaded line in case of an overload. In the other case, when resistance is inserted in the individual feeders, the result is to reduce much lower the voltage on the line which needs the extra power.

"In this plan of using resistance in the main machine circuit the protection against grounds or short circuits on the individual lines depends entirely upon the automatic circuit breakers or switches controlling the lines. This same plan is also employed under similar conditions in two substations of the Duluth (Minn.) Street Railway, with very satisfactory results. For all conditions so far considered, I believe that this method of limiting the output is preferable."

E. F. Gould, assistant general manager Aurora, Elgin & Chicago Railroad, Aurora, Ill., has had very good results from the use of resistance in the machine circuit only in both automatic and manually operated substations, and he says:

"It has appeared to us that on our system and under our conditions the resistance should be used for the protection of the rotary converter and located in the machine circuit. I think this is the operating condition most often met with in practice, though there might be cases where it would be desirable to locate resistance in some particular feeder on which excessive overloads occur frequently, or on a feeder where it was essential that a total interruption of current be avoided.

"A number of years ago we installed a complete automatic substation at a point on our line where such an installation is feasible, employing, as part of the equipment, load-limiting resistance connected in the machine circuit. This has proved very satisfactory and has given complete protection against excessive overload.

"Later on we installed load-limiting resistance only, in connection with converters in two of our manually operated substations. These resistances were also placed in the machine circuit and have served very satisfactorily, protecting the machines against excessive overloads at these points, which overloads have in past times caused a number of burnouts on these particular converters. It is our opinion that the use of load-limiting resistance in the machine circuit greatly increases the capacity of the old type rotary converter for handling overloads successfully. In our case it was about the same as converting a 500-kw. converter into one of 750-kw. capacity."

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Charles H. Jones, electrical engineer Chicago North Shore & Milwaukee Railroad, who is responsible for a very extensive installation of automatic substations in high-speed interurban service, has these views on where load-limiting resistance should be connected in, and on the idea of leaving out resistance altogether as suggested by certain persons:

"This is one phase of the automatic substation problem which has caused considerable controversy among operators of this type of equipment. A great many of the criticisms which have been offered against the use of limiting resistance no doubt merit consideration, but to a large extent the criticisms are based on theory rather than on actual practice. In discussing the subject it is necessary to divide it into the various classes of service to which automatic operation of substations is applied: (a) in a heavy city network; (b) on an interurban line; (c) for heavy traction work.

Resistance in City Service Substations

"In cases where a number of feeders come out of a station used in city service it has been customary to divide up the load-limiting resistance by placing a portion of it in the machine circuit and the remainder in the feeder circuits. The reason for doing this is to penalize only the feeder circuits which are producing the extremely heavy loads and allow the other feeders to have full voltage applied to them. In practice it has worked out that these overloads are of rather infrequent occurrence and generally are very well diversified so that the machine can safely carry this individual feeder overload for a limited period of time. In the course of development of substations for use on this class of work it has become rather common practice to eliminate the resistances in feeder circuits entirely and replace them with automatic reclosing circuit breakers.

"In order to protect against the overload on the machine, some persons have advocated the use of a shunt-wound converter in place of the usual compound-wound machine, as the shunt-wound machine has a drooping characteristic. That is to say, as the load comes on the voltage gradually drops off, and hence the load which the machine can possibly carry will be reduced. This theory does not seem to be very well founded, as in carrying overloads by this method the power factor of the machine also drops off quite rapidly. The result is that just as much damage may be done to the machine as would be done to a compound-wound converter without resistance, although the useful power output is substantially limited. In an extensive substation network, where the feeders are interconnected between two or more substations, this general method would be of limited value, as the reduction of voltage in one substation would cause the heavy overloads on the feeders to be normally picked up by the adjacent stations.

"Personally, I would not be willing to make an installation depending on the drooping characteristics of the machine only as the load-limiting scheme, as it is very possible that some of the protective features provided might not be ample fully to protect the equipment. In cases of extreme emergency, I would feel much more confidence in having a load-limiting resistance to cut in, thereby reducing the load to a point which could be absolutely predetermined.

"My own opinion is that the protective features should be based to operate on the current output of the machine or on the amount of heating which actually takes place within the armature. This would no doubt call for the insertion of thermocouples within the armature itself. The manufacturers, however, have not come to the point of believing that this is necessary. In a properly laid out distribution network using automatic substations there should be very little necessity for the load-limiting resistance to be brought into the circuit for an appreciable length of time, therefore the losses in the resistance should be a very small amount.

In Interurban Service Substations

"In the case of automatic substations applied to interurban roads the condition is entirely different from that in city work. The train spacing is considerably longer and the ratio between peak loads and average loads is considerably higher. In many cases it is financially impossible to install sufficient converter equipment to carry the peak loads unrestricted. In stations used on lines of this class there are usually very few feeder sections. Generally, there will be two sections, one going out in each direction from the station, and a considerably higher load will normally be expected on one feeder than on the other as a train is passing through. Therefore, there is a better reason for bringing in a certain amount of limiting resistance on the heavily loaded feeder than exists in the substation on city work. It is this feature of the question with which I am most familiar and our experience has been to use limiting resistance in both the feeder and machine circuits. The results obtained have been very satisfactory and actual tests made show that the energy losses in resistance are comparatively small.

"I have recently made an automatic substation installation on the Chicago & Interurban Traction Company line on which I placed all the resistance in the machine circuit and used automatic reclosing circuit breakers on the feeder circuits. The conditions on this line are considerably different from those on the North Shore Line and my reason for making the installation as I did was to determine, if possible, whether there was any particular advantage in it.

"With reference to substations for use in heavy traction systems, I am of the opinion that it will require very careful study and investigation to determine whether or not it is desirable to use load-limiting resistance in either the feeder or machine circuits. I recently had occasion to visit certain heavy electric traction roads and after studying very carefully the extremely heavy loads which they encountered, I came to the conclusion that only experience will determine exactly what course to follow."

Experience from City Served Completely by Automatics

F. C. Chambers, president Des Moines City Railway, who is responsible for the first complete installation of automatic substation equipment in city service, holds the opinion that whether or not resistance is necessary or desirable in the feeder circuits depends to a great extent upon local conditions. He discusses the problem as it occurs in city and interurban service as follows:

"On our interurban lines we are using resistances in the feeders as well as in the machine circuit. We have found this arrangement advantageous in several cases, as for instance when there is a break in the trolley between two substations which are automatically controlled and the trolley wire is on the rail so as to throw a very heavy overload on the rotary converter closest to the break. In such a case the feeder resistance would be inserted in the circuit by the action of the overload

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relays and the bus voltage at the substation would remain normal, permitting normal operation on the other section adjacent to this substation. This is desirable indeed in order to get the trouble car to the point of the trolley break without undue delay. We have experienced numerous other similar cases, such as congestion of traffic between substations which, without feeder resistances, would have interfered with the operation on other sections.

"It is also our practice to use feeder resistances in our city substations. However, I feel that the advisability of using resistances in city work will also depend largely upon local operating conditions. To illustrate this, we will assume that we have a rotary converter having a total capacity of 2,000 amp., that there are eight feeders supplied by this station and that in order to handle the peak load requirements the maximum setting of the feeder relays is 1,000 amp. and that the average load on the feeders is 200 amp. We will further assume that the relay controlling the first step of resistance on the rotary converter is set to operate at 2,000 amp. Under these conditions, the average load on the machine with a load of 200 amp. for each feeder is 1,600 amp. It would only require an additional load of 400 amp. on any one feeder, bringing the total ampere load in that feeder up to 600 amp., to operate the relay controlling the first step of resistance in the machine circuit.

"Under these conditions it is very evident that the feeder resistance would be inoperative inasmuch as the machine resistance would be cut into circuit before the current in the feeder had risen to a value high enough to operate the feeder relay. Of course, this is a theoretical case, but I have seen it work out a number of times in practical operation in our substations. On the other hand, we have had numerous cases where the relays controlling the feeder resistances have operated during a congestion on the lines supplied by these particular feeders, despite the fact that the conditions were apparently identical with those set forth above. In these instances, were it not for the fact that the feeder resistances were used, the potential on all lines feeding from this particular station would have been reduced and the load transferred onto adjacent substations, with the result that schedules would be slowed up and possibly add further to the congestion due to the lowering of the voltage at the bus.

"I have given this matter considerable thought and my experience has demonstrated pretty conclusively that if I had the installations to make over again, both on our city and interurban systems, I would use feeder resistances in both cases, despite the fact that without them the initial cost of the equipment could be materially reduced and less space would be required for the equipment."

Experience in Metropolitan Street Railway Service

L. D. Bale, superintendent of substations Cleveland (Ohio) Railway, has probably had the most extensive experience of any electrical engineer with the automatic substation as applied to the very large city railway system where any interruption to service is of gravest concern. His views on the subject under discussion are therefore of great interest. He writes:

"This question in my estimation is a variable one, depending upon many conditions. There are primarily three combinations: (1) resistance in both machine and feeder circuits; (2) resistance in the machine circuit and the so-called differentiating transfer scheme in the feeder circuits, and (3) resistance in the machine circuit with automatic reclosing circuit breakers on the feeders. A fourth system is being worked out in Cleveland at present, using the resistance in the machine circuit and the differentiating scheme worked out on the feeders in conjunction with an auxiliary bus and remote control. Which of these four ideas is to be used depends in my estimation entirely upon the class of service, the importance of the station to the system, and the size of the system.

"It has been demonstrated in Cleveland that with limiting resistance on tie feeders of relatively low ohmic resistance, the contactors on these feeders will on normal overloads open and close in rapid succession (pump), simply transferring the overload to adjacent stations momentarily. On stub-end feeders this system of resistance would be satisfactory in most cases, for since there is no other source of power to the feeder there would be the absence of pumping on overloads. Another difficulty with the resistance plan on important feeders is the fact that in the event of legitimate overload occurring, resulting from a tie-up for example, the resistance would be inserted in the feeder, thus lowering the voltage at the most inopportune time, for in this case it is desirable to furnish the best power possible.

"With the second combination mentioned; that is, differentiating schemes with no limiting resistance in the feeder, the operation of the transfer device as caused by short circuit only, requires that the feeder or section shall remain dead until such time as the trouble has been removed. There are some systems in operation where it is desired to burn off all grounds possible and attempt to maintain service on the lines under all conditions. It is readily seen that with the scheme under discussion this burning off cannot be accomplished. This is also generally true with the third combination; that is, when using the automatic reclosing circuit breaker.

"The fourth combination; that is, the differentiating scheme with auxiliary bus and remote control which is being worked up in Cleveland at the present time, is designed to meet with the demands of the management for just as near 100 per cent continuity of power as possible and the maximum degree of reliability and flexibility in the distributing system. Briefly, the operation is as follows:

"In the event of a feeder grounding, it will automatically be transferred from the main bus to the auxiliary bus, in which position it will be fed power through tie feeders transferred to the auxiliary bus by means of remote control, thus burning off any normal ground. There will also be installed a current-limiting resistance between the main bus and the auxiliary bus under remote control, that may be used in conjunction with tie feeders for burning off purposes. Quite aside from the question of grounded feeders, it can be realized that this system will constitute a most flexible arrangement whereby load may be transferred or shifted at will to relieve almost any emergency condition that may arise.

"Regarding resistance in the converter circuits, I personally do not believe the elimination of this resistance to be the proper thing at the present time. This, however, may come later, possibly when the high-speed circuit breaker has been perfected and can be purchased at a sufficiently reasonable price to install upon feeders."

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General Features of A. R. A. Exhibits

Many New Devices and Important Developments in Specialties and Railroad Equipment Which Have Been Brought Out Since 1920 Shown at Atlantic City Convention of American Railway Association, Mechanical Division—Machine Tool Exhibits of Particular Interest

THE American Railway Association, Mechanical Division, which includes the former Master Car Builders' and Master Mechanics' Associations, met at Atlantic City, N. J., June 14 to 21. An exhibit of railway supplies on Young's "Million Dollar Pier" was an important feature of the convention and as no exhibit was held last year particular interest was shown in developments which have occurred since 1920. In the variety of equipment shown, this year's exhibit surpassed all predecessors. The floor space occupied by the exhibit did not quite equal that of 1920, but this was due to the fact that the galleries were not used for exhibits this year, as they were in 1920. All other available space on the pier was occupied. About 96,000 sq.ft. of exhibit space was available.

There were 341 exhibitors, and the exhibit committee reported that seventy-five applications for space could not be granted. Many exhibitors were forced to use less space than they contemplated using, as the committee found it necessary to cut down the space allotments to accommodate more exhibitors. The exhibit committee established a new record this year in the promptness with which material was delivered and installed. Shipments of exhibits arrived earlier than usual in Atlantic City, and when the convention opened on Wednesday morning all was finished and in readiness for the visitors. The general impression conveyed was that there was a greater variety and a larger number of small equipment devices exhibited. Machinery Hall was filled with the usual types of machine and shop tools and, as at previous conventions, this was a special feature which attracted considerable attention. Developments in chucking devices and in the control of the operations of the various shop machines were especially elaborate and showed that manufacturers had given special attention to cutting down the time and labor necessary in machining various parts.

Improved Equipment Exhibited

A motor-driven portable woodworking machine was shown. This is designed to perform many different woodworking operations. The driving motor and operating parts are mounted on a small four-wheel truck which runs on a track the full length of the carpenter's bench. Planing, beveling, ripping, mortising and similar work can be done with the same machine by simply attaching the required tools.

Other shop equipment and machine tools of new design or with new attachments included a 42-in. vertical boring and turning mill with many new features of design, improvements in lathe construction with new geared heads and motor drive arrangements, tool posts designed to increase the speed of changing cutting tools, planers designed to combine high productive capacity with maximum ease of operation, metal and band saws with special attachments, and an air brake hose dismantling and assembling machine. A new electric hoist developed for use with limited headroom formed an interesting exhibit. The 3-ton hoist exhibited can be operated with a headroom as low as 14 in.

Many models of industrial trucks were shown also. A type of truck particularly adapted for use in electric railway shops and storerooms consisted of a combination electric crane mounted on a truck. This is intended for service where material is to be raised or lowered and then transported horizontally. Other types were provided with low platforms and elevating platforms for convenience in loading and distributing parts at different levels.

A moisture separator for shop air lines, particularly adapted for use in railway shops, was shown. The use of this device is very desirable in connection with paint spraying operations and also for use where air lines are used for blowing out various electrical equipment parts. Where air hammers or air-operated tools are used their efficiency is increased when clean dry air is available, and freezing during severe winter weather is prevented.

Comprehensive Display of Pneumatic Tools

New developments in pneumatic tools included a sleeve-type valve for riveting hammers, a progressive lock for both chipping and riveting hammers to prevent the handles from coming loose on the cylinders, and a drill motor with an improved toggle connecting the piston rod to the crank pin. The sleeve valve for riveting hammers is designed to eliminate valve breakage and to reduce to a minimum the necessity of oversizing valves. The toggle for connecting the piston rod to the crank pin is designed for minimum weight consistent with strength so as to prevent crystallization in the companion parts and enable it to stand up under the severe service required. Constant lubrication direct to the crank pin is also provided by means of this new toggle. A patented breather tube has also been developed for drill motors. Heretofore drills and other similar tools have required lubrication at quite frequent intervals, but with the breather tube the period is lengthened considerably.

A new self-lowering ball-bearing jack was exhibited. This is designed with its own brackets and wheels attached. The wheels are 5½ in. in diameter and the operating lever is arranged so that when inserted in a socket it can be used as a handle for wheeling the jack about. The lowering of the load is controlled by a small lever at the side of the jack through worm gears.

A large amount of welding equipment was displayed. It included all classes of gas, electric and thermit welding apparatus. Automatic arc welding was given particular attention. The field of usefulness for these automatic machines has been found to be much larger than was originally expected. Exhibits also included many car construction parts and truck parts with electric welding in place of previous designs with rivets.

A portable electric-welding device which controls the feeding of the electrode wires into the arc and which can be used in any place where welding current is available was shown in one of the exhibits. The automatic and semi-automatic method increases the speed of welding and makes it possible for a comparatively inexperi-

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enced man to do good work consistently. A large-capacity portable welding outfit was also shown. It consisted of a motor-generator set and control apparatus mounted on a four-wheel hand truck. The generator has a continuous capacity of 300 amp. and for cutting and other work of an intermittent nature will develop 400 amp. The set is supplied with either direct or alternating current motor and weighs complete about 1,700 lb.

MANY INTERESTING CAR FIXTURE EXHIBITS

Electric railway officials found much to interest them in the exhibits of car parts and car fixtures, specialties and appliances. These included new types of seats and seat parts, car trimmings, hardware, curtains and safety treads, together with displays of drawn steel and pressed steel shapes and stampings.

A renitent car window post of new design was shown. The use of this post makes the sash watertight, rattle-proof, interchangeable and safe against sudden dropping. It has the advantage of being easily removed from its runways without the use of tools. A metal-bound felt weather stripping for car windows was also shown. This is made of all-wool, hand-pressed weather felt cut to length as specified.

Other exhibits of special interest to rolling-stock engineers were those of trucks, wheels, brakes, brake shoes, slack adjusters and foundation brake rigging. A car truck with wrought steel side frames formed in one piece attracted considerable attention. The blank for the complete frame is produced from a steel blank in one piece, and at one operation by shearing between dies under a hydraulic press of high capacity. Renewable wear plates are welded to the faces of the columns, thus preventing any wear of the column proper by the bolster. The brake hanger brackets are of malleable iron riveted in the standard location and arranged to take their regular hangers and pins. A wrought-steel truck bolster flanged or forged in one piece from a steel plate was also shown. This bolster plate is first blanked out, then flanged and finally folded into a complete box section, the contacting flanges being welded together along lines not subject to service stress. Reinforcements are provided under the center plate and over the truck springs, and the bolster guides are of the usual standard design.

A new design of roller bearing truck was also shown this year. The rollers for the radial load are mounted in a double squirrel cage. For a 5-in. x 9-in. journal there are thirty-six rollers, two sets of eighteen each, ¾ in. in diameter and 2½ in. long. The rollers are of chrome steel, oil treated. Beyond the roller cage, toward the end of the axle, is a roller thrust bearing which is held between two bearing plates. The entire assembly is secured by a nut on the end of the axle, this nut being secured by a bar lock held by two screws.

Several new designs of journal boxes were shown. One consisted of a malleable-iron journal box equipped with renewable pressed steel liners in the pedestal ways and equalizer seats. The pedestal-way liners are formed of mild or medium steel, so as not to wear the more expensive pedestal jaws. The liners are heated before application to the box and forced into position, and the top and bottom ends are clamped securely around the corresponding ribs of the box. A hoodless lid for journal boxes formed a part of one exhibit. This lid covers the box face entirely across the top as well as at the sides and bottom. Hair-fiber dust guards which are said to be superior to and more durable than the old type of wooden guards for truck journal boxes were also shown. These dust guards are furnished in three styles, consisting of plain composition felt, the same guard waterproofed, and one with a hair fiber reinforced on both sides by jute fiberboard.

Two new designs of brake-shoe keys were shown. These had special features to prevent their becoming loose and lost. The principle of these keys was to provide a spring construction which could be readily inserted and when installed would provide sufficient pressure to lock the key in position. The keys are made standard in all essential dimensions.

A new device exhibited this year which proved of special interest to master mechanics was a surface metal gage for gaging the amount of metal to be removed from worn flanges of wheels to restore the standard contour and to indicate in advance of turning the final tape size of the wheel, so that remating could be done without loss. The gage also indicates the amount of surface metal that will remain after turning. This latter provision frequently foretells that the wheel will fall within the scrapping limit after it has been re-turned and thus not only saves the labor of re-turning but prevents the handling of wheels unnecessarily.

Safety Campaign of Long Island Railroad

Statistics Show that Plan Is Worth While—Special Efforts Are Now Being Made with a View to Reducing Grade Crossing Accidents

OWING to the extent of its suburban service the Long Island Railroad has long been prominent in safety work. The company has a general safety committee, with L. S. Wells, electrical superintendent, as chairman, and six sectional committees. Meetings of the general committee are held quarterly and of the sectional committees monthly, and it is expected that these committeemen will exercise special vigilance in the interest of safety and will report any defective conditions which may come to their notice. The labor organizations have supported the movement cordially.

Since the inauguration of the safety organization, more than 4,000 suggestions relating to unsafe practices and conditions have been considered by the safety committee, and the results have been well worth while, as indicated by the following summary of persons killed and injured (including suicides and trespassers) during the past three years:

	Total Killed	Total Injured
1918	79	2,753
1919	45	2,137
1920	34	1,278
1921	37	1,002
Net decrease (three years)	42	1,751

No passengers were killed during 1919-1920-1921, and there has been a gratifying decrease in the number of casualties to employees.

Unfortunately equally good results have not been obtained in the case of accidents at grade crossings and to trespassers on the right-of-way. This may be accounted for by the fact that it is difficult to reach the people involved in such accidents. Hence the company is taking an active part in the general safety movement of the American Railway Association, known as the "Careful Crossing Campaign," effective this year during June, July, August and September.

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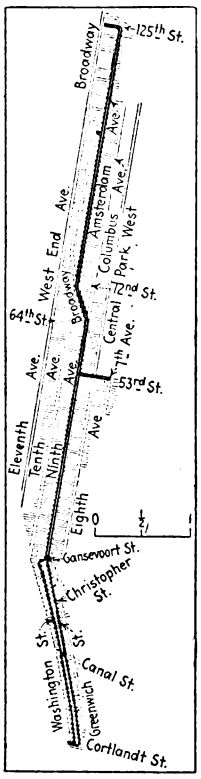
In 1921 ten persons were killed and twelve injured at grade crossings of the Long Island Railroad. In addition, more than 300 crossing gates, or one nearly every day of the year, were broken by reckless drivers in disregard of warning signs. It is probable that the fatal accidents on Long Island would have been materially greater if several years ago the management of the company had not inaugurated a campaign to keep before the people of Long Island the necessity of exercising reasonable care at grade crossings.

Ninth Avenue Railroad Converted to One-Man Operation

Among the Many Improvements on This North and South Line on the West Side of New York Is Complete Conversion to One-Man Operation—The Service Is Growing in Popularity

BY ORDER of the court in 1919 the receiver of the New York Railways Company surrendered two of its important leased lines to their owners. The Ninth Avenue Railroad, with a length of 18 miles in single track equivalent, was returned on Oct. 1, 1919, just two months after the Eighth Avenue Railroad was returned. The financial interests controlling these two properties have always been to a considerable extent the same, and both are now being operated by W. B. Yereance, who is general manager and chief engineer of both companies.



MAP OF THE NINTH AVENUE RAILWAY

The lines of the Ninth Avenue Railroad extend from Cortlandt Street ferry northward along Washington and Greenwich Streets and Ninth Avenue to Sixty-fifth Street, then up Broadway to Seventy-second Street, then north on Amsterdam Avenue to an extension of West 125th Street called Lasalle Street, then west one block to Broadway. While under lease to the New York Railways, the Ninth Avenue cars ran only as far north as Fifty-third Street, and the service on the northern part of the line was furnished by New York Railways cars, which south of Fifty-third Street ran on Broadway or Sixth Avenue. This latter service, of course, has now stopped and has been replaced by a complete Ninth Avenue service.

The territory served is of a somewhat varied character. The upper part, or that north of about Seventieth Street, is largely an apartment house and high-class family hotel district with small but high-grade shops. Farther south are, successively, shops and apartment houses of lower grade, a very extensive manufacturing district; then, on the lower section, a wholesale warehouse and market district.

At present the schedule north of Fifty-third Street calls for a headway of two and one-half minutes and that south of five minutes. This is produced by the operation of two main routes. The first is from the northern terminal to the corner of Fifty-third Street and Ninth Avenue, then on the Fifty-third Street branch to Seventh Avenue. The second route is from 116th Street (Columbia University) south, the cars going alternately to Gansevoort Street and to Canal Street, where the cars turn north again.

Owing to the great amount of street congestion south of Canal Street it was thought better to put on a loop service on that end of the line so that interruptions to the traffic there would not throw out the schedule north of Canal Street, especially on Amsterdam Avenue, where a good short-haul business has been developed.

One-man operation was begun in the latter part of March, 1922, on the 125th Street-Seventh Avenue line and now has been extended to the entire line.

The cars are the same as those formerly used with two men and are equipped with folding doors and have no bulkheads. As these cars are the first one-man cars on the west side of New York, it took some time to educate the public to their use, especially as during the transition period there were both two-man and one-man cars on the Ninth Avenue line. Each car, however, carried a large translucent "Entrance" sign on the right-hand window of the front vestibule directly over the destination sign. Removable iron shutters were provided to cover these "Entrance" signs when the car was run by a two-man crew during the transition period. When not needed these shutters were removed and placed in a spare pocket of the destination sign box.

The conductor's day card was simplified, and the men, most of whom were motormen under the old two-man operation, have become quite expert in making change. At the outset the one-man operation was slow and line headways were seriously irregular. Each week has seen an improvement in the skill of operators and also co-operation of the public, who have rapidly learned to (1) stand at the proper point to board the car without delay, (2) have exact fare ready (instead of the majority requesting change as heretofore, now not 10 per cent of the passengers request change and then usually for but a dime, although sometimes a $5 or $10 bill is tendered) and (3) pass back into the car so as to leave the forward aisle and platform clear.

Before the inauguration of the one-man service was attempted window display cards gave notice of the change and solicited the co-operation of the public. Patrons as well as operators have done their part and now the road is running practically as satisfactorily as before the change. Accompanying the change and for the reasons cited, a perceptible drop in earnings was experienced. This, however, is now being gradually overcome.

Shop Statistics

SHOPS operated by electric railway companies number 624 and represent $92,057,905 of capital, according to a report just made to the Senate finance committee by the Bureau of the Census. When the 1919 census was taken these plants had salary and wage payments totaling $42,052,521. Officers, superintendents, managers and other salaried employees totaled 1,847. A total of 53,830 hp. was employed. The value of products in 1919 amounted to $75,210,701.

Seven establishments, with an invested capital of $17,306,485, are engaged in the manufacture of cars for electric railroads. When the 1919 census was taken these plants had salary and wage payments totaling $4,984,941 annually. The value of products is given as $18,441,976.

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Mechanical Division of A. R. A. Meets in Atlantic City

Reports and Recommendations of Committees on Car Wheels, Brake Shoe and Brake Beam Equipment and on Specifications and Tests for Materials Were Among Those Presented

AT THE convention of Division 5, Mechanical, American Railway Association, held in Atlantic City on June 14-21, reports were presented by the various committees. Several of these are of interest to electric railways and these are abstracted in the following paragraphs:

In the report of the committee on car wheels recommendations were made to clarify the matter of condemning limits for steel and steel-tired wheels. In 1920 the contour of the back of flange of steel and steel-tired wheels adopted in 1912 was withdrawn from the standards and the 1909 contour readopted as standard. With the 1912 contour the back of the flange of steel and steel-tired wheels was identical with that of cast-iron wheels between the base line and the top of flange. The change to the 1909 contour reduced the width of the rim from 5 1/16 in. to 5 1/2 in., and the backs of the flanges of steel and steel-tired wheels are not now identical with those of cast-iron wheels between the base line and a point approximately 1/2 in. above same.

Due to the above difference this year's committee recommended that the drawing of the maximum and minimum flange thickness gages for cast-iron solid steel and steel-tired wheels be changed to show the height of the surface which comes in contact with the back of flange to be 5/8 in. instead of 3/4 in. With dimensions as at present, these gages will not correctly indicate the condemning limits for maximum and minimum flanges of steel and steel-tired wheels. The proposed change will have no effect whatever as concerns cast-iron wheels.

An important factor in increasing the life of wheels is to pair and mount on the same axles wheels of as nearly as possible similar physical characteristics. This year's committee considered the question of attempting to mate wheels of equal hardness but reached the conclusion that the only practicable method of doing this is in the case of solid wrought carbon steel wheels to mate them within a 0.05 per cent carbon content range, and in the case of cast-iron wheels to mate by tape sizes as already provided for in the recommended practice for mounting wheels.

In presenting the report, W. C. A. Henry, chairman, said that prior to the issuance by the Bureau of Locomotive Inspection of limits of wear as adopted by the M. C. B. Association in 1909, various railroads established their own limits, some of which permitted greater wear than those now in effect. One railroad conducted laboratory tests which indicated that rolled steel wheels are of ample strength to permit greater wear than the test limits allow. The committee was of the opinion that solid rolled steel wheels confined to switching service may, with perfect safety, be worn to the limit of wear groove instead of 1/4 in. above it, which is the present condemning limit for all classes of service. If this change were made a very substantial saving would result.

In discussing the report C. T. Ripley of the Atchison, Topeka & Santa Fé Railroad said that if it is safe to use a rolled steel wheel with 1/4 in. more wear in service, it would mean a saving of hundreds of thousands of dollars to our railroads. Indications from laboratory tests and observations in service shows that railroads have not gone as low on rolled steel wheels as they should. The limit of wear on rolled steel wheels is governed by the distance from the throat to the underside of the rim on the back. At this point a sharp corner is encountered which tends to make breakage improbable. With a full radius at this point, there is a 1 3/4 in. limit. This does not seem fair to the rolled steel wheels. The general feeling is that the failure of a flange on a rolled steel wheel is not due to the tread being thin or this dimension being down to 1 3/8 in., but is due to a defect in the wheel.

James Hall of the Southern Pacific Railroad submitted a gage for consideration and in discussing this said that there is another point to be considered when gaging worn wheels. There is a condemning limit of 1 3/8 in. of metal through the throat of the flange taken at the back for inner face of the wheel. It has been found that the critical line at the front or outside face of the wheel and that at the back or inside face do not in all cases coincide, and while a wheel might have the required amount of metal at the outside, it may have reached the limit of wear of 1 3/8 in. at the back or inside, which might be overlooked. The gage submitted provided for that, the tail of the gage which extends along the back of the wheel being graduated and a scrap limit mark provided. These graduations are not intended to give the exact amount of metal through the throat of the flange, but merely to act as a precaution against going below the 1 3/8 in. scrap limit. The gage is also provided with an attachment for determining the amount of metal necessary to remove from the treads in order to restore contour. The graduation indicates to a sixteenth of an inch the depth of cut taken.

O. C. Cromwell of the Baltimore & Ohio Railroad said that many times one of a pair of wheels is worn to a thin flange while the other has a relatively thick flange. With that condition only half the mileage is obtained that would result if the two flanges were worn an equal amount. Uniformity of carbon content assists in giving the wheels more nearly the same hardness and results in a more even wear of the flange. In regard to reducing the limit of wear, in line with the limit of wear grooves, the figure of 1 3/8 in. was established on the line of steel-tired wheels as the only basis with which this could be measured and in those cases the underside of the rim was cut or turned to give about 1/4 in. less metal than with rolled steel wheels which are slightly tapered on the underside of the tread.

J. A. Pilcher said that the Norfolk & Western Railway was conducting a series of experiments in regard to running the wheels thinner. It has run wheels safely 1/4 in. thinner than the limit set.

A motion to accept the report was put to a vote and carried.

The committee on brakeshoe and brake beam equipment made a study of brakeshoe construction and as a result recommended a design of steel back brakeshoe to letter ballot as recommended practice as the best that the committee could develop which is not covered by patents.

A canvass was made of the situation regarding brake shoe keys, and as a result the committee recommended the lengthening of the head from 1/2 in. to 1 in. and bending it over instead of upsetting it.

In the discussion following the report brake-beam reclamation was taken up. E. L. Burton of the New York Central Railroad said that in line with the committee's suggestion of last year, the New York Central had recently tested a large number of beams that had been reclaimed in its shop and almost without exception these beams failed to meet the test requirements. A large number of second-hand beams were returned to the manufacturer who made the necessary repairs. These beams were then subjected to the same tests as called for on the specifications for the new beams and almost without exception they passed the requirements.

G. G. Juneau of the Chicago, Milwaukee & St. Paul Railroad said that the specifications for brake beams should be just as rigid for the reclaimed beams as for the new beams.

A motion to accept the report and submit it to letter ballot was carried.

In the report of the committee on specifications and tests for materials a revision was made in the standard specifications for air brake and train air signal hose as follows:

"15. Label. Each length of hose shall have vulcanized on it a label of red rubber. This label shall be applied on the hose at a point 6 in. from the end (a variation of 1/2 in. either way will be permitted) and with the top of the lettering toward the center of the hose. The use of a rectangular label in addition to the band label is optional with any railroad providing space,

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preferably 2 in., is allowed between the two labels."

Revisions of recommended practice specifications were also made as follows:

(a) Specifications for turpentine to be revised as shown in Exhibit B, proposed form.

(b) Specifications for oxide of iron paste to be revised as shown in Exhibit C, proposed form.

(c) Specifications for black paint to be revised as shown in Exhibit D, proposed form.

(d) Specifications for raw linseed oil to be revised as shown in Exhibit F, proposed form.

(e) Specifications for boiled linseed oil to be revised as shown in Exhibit F, proposed form.

(f) Specifications for red lead to be revised as shown in Exhibit G, proposed form.

New recommended practice specifications were also recommended for submission to letter ballot by the association as follows:

(a) Specifications for mineral spirits as shown in Exhibit H.

(b) Specifications for red lead and oil as shown in Exhibit I.

(c) Specifications for extended red lead paste paint as shown in Exhibit J.

In discussing the report of the committee on specifications and tests for materials, H. F. Bentley of the Chicago & Northwestern Railroad said that he had found a large number of axle failures were due to the impression left by a sharp pointed tool in the roughing cut rather than to the kind of steel used in the axle. In investigating troubles experienced by his road, he found that on etching the broken parts there was indication that an original check had been made in the bearing of the axles by a pointed diamond shaped tool. Subsequent operation on this bearing through the rolling to a smooth finish had covered up the grooves and to all appearances the axle had an excellent finish. Through the assistance of Dr. Howard, engineer of the Interstate Commerce Commission, it was proved conclusively that the initial start of the fractures on the majority of the axles was due not to the quality of the steel but to the tool impression left.

G. W. Rink of the Central Railroad of New Jersey said that the question of heat-treated axles has not been fully settled as yet. In connection with a recent order Mr. Rink said he was surprised to learn that those engaged in doing the heat treating did not recommend heat-treated material for that purpose. They predicted all sorts of calamities and stated that a greater number of broken axles would result.

W. F. Kiesel, Jr., of the Pennsylvania Railroad said that they had used a large number of heat-treated axles, crank pins and other parts and in studying difficulties experienced, had found that a nick or a sharp corner was almost certain to start a detailed fracture. He recited one case where a radius between the wheel seat and the body of the axle was not clearly defined on the drawing. Some of the radii seemed about ¼ in. and the fracture started at this point. The radius was increased to 1 in. and half of the fractures ceased.

The report of the committee was approved for submission to letter ballot.

Pacific Claim Agents Meet

In Three-Day Session They Discuss Railway Claims and Accident Reduction Problems

PLEDGING renewed efforts to accident prevention, claim agents and attorneys of every electric railway on the Pacific Coast attended the thirteenth annual convention of the Pacific Claim Agents' Association in Los Angeles, June 7, 8, and 9.

C. M. McRoberts, general claim agent of the Los Angeles Railway, was chosen president at the annual election and will preside over the 1923 session to be held in Portland, Oregon. Other officers elected are: S. A. Bishop, general claim agent Pacific Electric Railway, Los Angeles, first vice-president; P. O. Solon, claims attorney San Francisco-Oakland Terminal Railways, second vice-president; B. F. Boynton, claim agent Portland Railway, Light & Power Company, secretary-treasurer.

The convention was called to order on Wednesday morning, June 7, by Frank D. Oakley, attorney for the Tacoma Railway & Power Company, who served as president during 1921 and 1922. D. W. Pontius, vice-president and general manager Pacific Electric Railway, made the address of welcome, which was responded to by the president.

After disposing of business affairs at the morning session, the afternoon meeting was opened with a talk by R. C. Gortner, trial attorney for the Pacific Electric Railway on "Liability in Claims Involved in Joint Enterprise or Venture." The remainder of the afternoon was devoted to discussion of subrogated claims. Under California law a passenger in an automobile driven by a second party may recover damages either from the driver of the machine in which he was riding or the railway or owner of any other vehicle with which the first machine might be in a collision, regardless of where the responsibility rested. The organization went on record as favoring widening the scope of imputable negligence in such cases. Steps will be taken to bring the need for such action before the California Legislature.

At the morning session, June 8, Thomas G. Aston, Washington Water Power Company, of Spokane, spoke on "Medical Testimony in Litigated Cases." He said that claim attorneys are apt to get the attention of a jury away from the main facts of an accident by delving into involved medical testimony. He declared that chief attention should be given to the actual facts of the accident.

J. H. Handlon of the Market Street Railway, San Francisco, discussed methods followed by that railway to promote close co-operation between trainmen and the claims department. The Market Street Railway sent to all trainmen a questionnaire asking what phase of accident reports and the securing of witnesses presented the greatest difficulties. By this means the officials were able to give detailed instruction on particularly vital points.

F. G. Furman of the Butte (Mont.) Electric Railway spoke on "The Technique of Trials," in which he discussed matters of selecting juries and presenting evidence.

The entire afternoon session, June 8, was devoted to safety discussions. S. A. Bishop took as his topic "The Ever-Increasing Automobile Accident." He advocated state examination of applicants for automobile drivers' certificates. This proposition is to be brought before the California Legislature at the next session by the Automobile Club of Southern California. The benefit of safety campaigns was discussed by H. K. Relf of the Spokane, Portland & Seattle Railway and H. G. Winsor of the Tacoma Railway & Power Company. The papers reviewed the history of accident prevention work on the Pacific Coast. The use of house organs was mentioned as a particularly beneficial way of reaching trainmen during accident prevention campaigns.

At the final session Friday morning, the following subjects were discussed: Accidents occurring at amusement parks, new methods of obtaining co-operation of trainmen with claim departments, advising operating departments of negligence and their costs, the Texas barratry acts, the advisability of offering a cash bonus to trainmen for freedom from accidents, and whether it is better after a serious accident in which a trainman was negligent to discharge him or to retain him in service at least until the case has been settled.

A resolution was passed that the association bring to the attention of coast legislatures the need for a law similar to the Texas barratry act, which is directed against the so-called ambulance chasers and makes it a misdemeanor for any one to solicit for his own profit employment in handling an accident damage claim for plaintiff or defendant when no personal interest in the case exists.

Co-operation with the American Railway Association in its grade crossing safety campaign was pledged. The slogan "Cross Crossings Cautiously" will be used extensively until Sept. 30.

The delegates were entertained June 7 by the Los Angeles Railway at a dinner in the Ambassador Hotel. Thursday evening a moonlight trolley trip to Mount Lowe was arranged by the Pacific Electric. Saturday morning the Pacific Electric took the claim agents and their wives to Riverside for lunch at the Glenwood Mission Inn.

On telegraphic invitation from President F. T. Griffith of the Portland Railway, Light & Power Company, the association decided to hold the 1923 convention at Portland, Ore.

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Duties of a Claim Agent*

Analysis of What a Claim Agent Can Do to Further the Interests of His Employers

BY J. H. HANDLON
Claim Agent Market Street Railway, San Francisco, Cal.

IN FORMER years claim agents considered that they were doing all that their employers could reasonably expect of them when they put forth every effort to safeguard claim department expenditures. Subsequently there developed almost a concerted movement to prevent accidents. Claim agents were often found heading these safety first movements, and if not they were well at the forefront because they saw the need of doing all they could toward preventing accidents.

Every conscientious claim agent, and they are a conscientious body of men, has again and again asked himself "What can I do more to benefit the company employing me?"

We will assume that such a claim agent fortifies himself with facts and figures relative to the claims department expenditures and claims department operations of other companies, that he compares such data with the records of his own company in the hope of detecting weakness in his own organization or lack of efficiency within himself or his associates.

If he is far-seeing he has also compiled at regular intervals statistics to guide the conduct of affairs of his own department and to disclose any defects of the operating department, ever bearing in mind that it is unwise to be a self-appointed critic of the operating officials if this should cause a lack of co-operation between the two departments to the company's detriment.

There is a factor that confronts claim agents which does not ordinarily present itself to those battling with other problems, for since there is no well-defined method of measuring the value or lack of value of a claim, the claim agent should not permit himself to be subject to prejudice, weak, changeable or stubborn.

An unusually large number of rejected claims might reveal that a claim agent's disposition has become soured by an unjust verdict, or bitter toward all claimants because he was deceived by an unscrupulous claimant. On the other hand, a vast increase in the proportion of claims allowed might disclose listlessness or apathy which he should correct. The only way to mirror our actions is to contrast the results of our work from time to time, and that can only be done by compiling comparative, statistical information.

I like to compare the functions of a claim agent with those of a safety valve, for both prevent destruction and waste and neither can relinquish responsibility for one moment.

Some claim agents deem it their duty to assist in the selection and training of the men on the cars, and they maintain a follow-up system of keeping trainmen enthusiastic over their accident prevention work. They also busy themselves in civic or club or lodge affairs in the hope of advancing the prestige of their companies, and the further object of seeking an opportunity to obtain recognition in their own communities as upright, representative citizens whose word is of value.

Many claim agents have adopted a code of ethics which does not permit them to settle a claim unless with honor. Such claim agents endeavor to inject the same spirit of fairness into the actions of every one connected with the claims department.

I have heard it contended that claim agents should make a minute study of the law of negligence as well as about all classes of injury and up-to-date surgical methods so that they may more intelligently determine the question of liability and the extent of the injury. While it is well to have a working knowledge of law and medicine, I believe that there is truth in the old adage that "a little learning is a dangerous thing." A claim agent who makes a close study of such subjects is disposed to pride himself upon his superior knowledge and therefore often loses his sense of perspective. It is far better for the claim agent to be guided by expert legal and medical advice supplemented by his own knowledge and experience.

Something more might be accomplished by the average claim agent if he should devote a portion of his time and energy to such matters as:

1. Assisting the operating department in enforcing discipline by reporting all infractions of rules and instances of carelessness or negligence that come to his knowledge.

2. Co-operating with the transportation department in its efforts to reduce the turnover of platform men by doing everything possible to create a more pleasant environment for trainmen, for we all realize that the newly employed trainman is more subject to accidents than the experienced man.

3. Keeping the operating department supplied with safety literature and safety data, not only that they may learn what is being done elsewhere in accident prevention work but with a view of preventing the trainmen from lapsing into carelessness. This to supplement the work of the safety committee where such organization exists.

4. Devising safety rules and suggestions for the operating department, many of which would occur to the claim agent as a result of the investigations he has made of accident causes.

5. Informing ourselves as claim agents of the problems of the company that we may educate others to a better realization of what our employers are doing for the community.

6. Encouraging a better feeling between employees and employer whenever an opportunity presents itself.

7. Establishing various channels of information between all company departments and the claim department with a view of facilitating the gathering of knowledge that would prove of value in the handling of claims, as often company employees learn facts from outside sources that could be used by the claim agent to advantage.

8. Devoting a portion of our time as claim agents to enforcing collections for damage to company property, even extending whatever work we have been doing in that direction in the past and especially since the insurance companies are becoming more and more insistent that the transportation companies should, through subrogation, bear a portion of their losses.

*Abstract of paper presented at the thirteenth annual convention of the Pacific Claim Agents' Association, Los Angeles, Cal., June 7, 1922.

Engineering Educators in Session

AS THIS issue of the JOURNAL goes to press the Society for the Promotion of Engineering Education is in session at the University of Illinois, Urbana, Ill. After a stirring address by President Charles F. Scott, formerly chief consulting engineer Westinghouse Electric & Manufacturing Company and now professor of electrical engineering at Yale, in which he traced the parallel development of university education and the economic trend in industry, the following resolution was passed:

"Whereas, the president of this society, visioning the future, has after a careful study of the possibilities of greatly enlarging the scope of its activities made certain recommendations and whereas in his opinion there is a reasonable possibility of securing funds for the Society for the Promotion of Engineering Education if an adequate plan is developed and indorsed by this society, and

"Whereas the president of this socicil, this society stands challenged by the conditions thus presented, now be it

"*Resolved*, That the president of this society appoint a committee of five members, including himself, to study the development of the society for the promotion of engineering education and to formulate an answer to the question 'What can the society do in a comprehensive way to develop, broaden and enrich engineering education,' and further that this committee shall report, as early as feasible, formulations of an answer back to the council for action on the committee's recommendations."

The keynote of all discussions at the sessions of the society was the development of teachers who can train engineers, with analysis of the plans that are now being studied to make university training more effective.

Prof. C. F. Scott was re-elected president, and among the directors elected was M. W. Alexander of the National Industrial Conference Board.

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The Modern Railway Motor*

By J. K. Stotz,
Canadian Westinghouse Company, Hamilton, Ont.

THE first commercial railway motors were built in the '80s. Vandepoele, Henry Daft, Bentley, Knight, Short and Sprague were the men prominent in the development at this time. These old motors were of the double reduction gear type because of the low car speed and the high motor speed considered necessary at that time. The first single reduction motor was put on the market in the spring of 1891. The Westinghouse motor was the No. 3. After the No. 3 came the 12 and 12-A, the 38 and 49. The G.E. 800 and 1,200 were developed in this same period.

Commutating poles were introduced in 1907 and 1908 and in 1915 and 1916 the light-weight idea hit the railway field. Car bodies, trucks and electrical equipment were cut to the bone. The low-floor car appeared due to the demand for lightweight and to women's skirts. This meant small wheels, small motors, more power in the same or less space. The result was the ventilated motor with a fan on the shaft for the circulation of air through it. The use of the fan increased ratings and hence the current densities at which it was possible to work the copper. This was a real gain and its benefit has been retained in our present designs.

The speed curves of the modern motors tend to be steep. There is some argument as the relative value of steep and flat speed curves, but in most applications the steep curve seems to have the better of it. In these days of automobile traffic, the car that can pick up and go when it has a clear track is most in demand. Rapid acceleration and high balancing speed with low power consumption are the ideals usually sought. Power consumption is less for a given car speed, or for the same power consumption a higher speed may be obtained with a steep curve.

A steep speed curve means a motor with relatively low saturation. To get this and keep light weight means the use of the best magnetic materials. Laminated cores built up of thin japanned punchings have long been standard. Poles are made of thicker laminations, bolted to cast-steel frames. Air gaps are made as small as mechanical considerations and speed requirements will permit. Field control is coming into increasing favor on many applications where the power saving due to it is large.

Railway motor ratings are more or less fictitious in that they do not represent the power that the motor will develop under operating conditions. Because of the nature of the motor load, this would not be possible. The ratings that we give a motor are a short time rating, which is a measure of the thermal or heat storage capacity of the machine, and a continuous rating, which is an indication of its ability to dissipate heat continuously.

With the old non-ventilated motor these two ratings had a fairly definite relation to each other: for instance, on the 101-B-2 the continuous amperes at 300 volts were 35 or 49 per cent of 72 amp. the one-hour current at 500 volts. But the advent of the ventilated motor upset this ratio. The one-hour rating stayed about where it was but the continuous rating was increased, until it was from 60 to 70 per cent of the one-hour current. In other words, for the same continuous rating, the overload capacity, as measured by the hour rating, was reduced. This was not thoroughly realized at first and resulted in some misapplications of equipment and much abuse by the operator who was accustomed to using his cars for bucking snow, hauling in dead cars and generally performing any emergency service that might come along.

Most operating men have learned by now that motor ratings are not what they used to be, and while they are getting more, much more, out of every pound of motor than they did ten years ago, they realize that there is a very definite limit to overload capacity on this modern motor and it cannot be exceeded without leading to trouble. As the effects of short overloads are better understood and appreciated by the operator, troubles from this source will decrease. Of course, there will always be roasted equipment. The road must operate "whether or no," and if the motors are overloaded in an emergency it cannot be helped for cars must be kept running at any cost. At least that's what the transportation departments say, and all the master mechanics can do is hire more armature winders.

Type	Motor Number	Weight (Lb.)	1 Hour Amp. 100 Lb.	450 Volts Continuous Amp. 100 Lb.	Ratio of Cont. to 1 Hr. Amp. 100 Lb.
					Per cent.
Ventilated Commutating-pole	508A	1,035	4.63	3.38	73
	514-A	1,650	3.64	2.18	60
	533-T	2,300	3.22	1.95	60.5
	306-CV-4	2,700	3.48	2.22	64
	557-A-8	4,050	5.0	3.33	67
	577-A-6	5,650	4.75	3.19	67
Non-ventilated Non-commutating-pole	12-A	2,200	2.14	.87	40.5
	38-B	2,400	3.34	1.29	28.6
	68	2,280	3.11	1.32	42.5
	101-B-2	2,780	2.59	1.15	44.4
	112-B	3,485	3.7	1.32	35.7
	121-A	4,300	3.38	1.56	46.2

The greatest developments of recent years in any motors have been in the improvement of the mechanical features, insulation and manufacturing processes. Most armature shafts now are made from heat-treated or alloy steels. Their design has been improved as our knowledge of the fatigue of metals increases. Fillets are made as large as possible and abrupt changes of section avoided so as to prevent localizing of the strain caused by the alternating bending movement produced by the pinion. We feel that the design of shaft will give very much less trouble due to bending and breakage than the old axle steel type.

Depending upon the size of the motor, armature cores are built either directly on the shaft or on a spider into which the shaft is pressed. The tendency seems to be away from spider construction except in the larger motors. The cores are built of a mild steel of high magnetic permeability insulated by Japan varnish. To prevent the core from spreading at the ends, end punchings of heavy $\frac{1}{8}$-in. steel laminations are used. To stiffen these still more the teeth of two punchings are spot welded together. Two or three of these are used at each end of the core, thus forming a very stiff construction which effectually prevents spreading of the punchings. Ample radii are used in the corners of the slots to reduce danger of teeth breaking due to vibration. The core is held between end plates pressed on the shaft. These end plates also serve as coil supports.

Armature coils must be properly shaped to wind easily, be accurately sized to fit the slots and fill the end space properly so that they will not vibrate, and must be insulated to stand the voltages and temperatures under which they are to operate. These conditions are met by using form wound or properly pulled coils, by pressing the slot portion accurately to size and by using every precaution in manufacture and taking advantage of every development in insulation. Railway motor coils are subjected to extreme vibration and abuse so that their insulation must be mechanically strong. Fish paper strips between turns and layers to prevent short circuits between wires are freely used. Extra taping or insulation is applied wherever strain or abrasion is concentrated.

The temperatures at which railway motors operate require the highest grade of heat-resisting material. Unfortunately, resistance to heat and insulating qualities are seldom combined with mechanical strength and resistance to moisture. The resultant insulation is a compromise, which represents the best that we can do with our present knowledge of insulating materials.

The first ventilated motors had small fans slightly larger in diameter than the armature core. A baffle extended from the frame to within a short distance of the armature in front of the fan. Air entered the motor in front of this baffle through openings in the frame, passed over the field coils and commutator to the front of the motor and was drawn through longitudinal ducts in the armature core, and under the end windings to the fan, whence it was discharged from the motor through another set of openings in the frame. This method of cooling is known as

*Abstract of paper read at the annual convention of the Canadian Electric Railway Association, Quebec, June 1 to 3, 1922.

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"series ventilation," because the fields and armature are cooled successively, and in the climatic conditions prevailing in Canada has demonstrated its effectiveness.

The next step was to make the fan larger in diameter, remove the baffle or enlarge its diameter to that of the fan, close the intakes at the rear of the frame and provide openings at the front for the air to enter by. This scheme is known as "parallel ventilation," because two parallel streams of air pass over the field and armature. In this Canadian territory, inclosing covers are necessary during the winter season to keep out fine snow or slush.

The fan passed from the small diameter one-piece casting, shrunk on the shaft, through the large diameter with plates riveted on the sides to control the air paths to the type where these plates were replaced by a ring cast integral with the fan to the present design of a dish with blades projecting from it, cast in one piece from steel.

Improvements in brush-holder construction have been toward the elimination of moving parts and the reduction of inertia of those remaining. Simplicity in design, as far as consistent with proper functioning, has been the ideal. Higher brush pressures have been made necessary in some cases by the condition of roadbed and equipment. The method of applying the insulating porcelains has been improved so that loose porcelains are becoming scarce.

Recent improvements in housings have been to make them generally stronger. The use of cast steel instead of malleable iron is increasing. Oil catching devices have been improved so that the danger of oil reaching the windings has been reduced.

The axle caps, especially the pinion end, are subjected to extreme vibration and pounding. As a result, it is necessary to be continually tightening the bolts on the caps. When tap bolts are used they soon strip the threads in the frame casting under this treatment. For this reason the design of frame and axle caps has been toward the elimination of tap bolts and the use of all through bolts wherever possible. We feel that in so far as casting difficulties and other design limitations will permit, we should have all through bolts on all our modern motors.

Axle bearing lubrication and design is much like armature bearing, except that the bearing is split and cannot be held in place by its fit. Dowels, either radial or axial, are used and both give more or less trouble. The latest development in this line is a combination of both. This consists of two axial dowels engaging holes in the flange of the bearing, and a third radial dowel entering the bearing at the rear between the window and the end. Clearances in the holes are made such that the bearing may be slipped over the axial dowels and then dropped onto the radial, even though they are at right angles to each other.

Helical gears are increasing rapidly in their application and are operating very successfully under all conditions of service. The use of helical gears reduces noise and vibration to a very great extent. This results in a great reduction in the troubles caused by vibration. Broken leads, loose punchings, bad commutation and various other troubles are reduced or eliminated by the use of the helical gear.

The principle of operation of the helical gear is well known by now. We may consider a helical gear as made up of a number of spur gears, each shifted around the circumference by a small amount. When the number of spur gears is small we get what is known as a stepped gear. When the number becomes large so that the advance in the adjacent tooth approaches a smooth curve we get a helical gear. Instead of a gear tooth entering into contact across the entire face at once, the contact begins at one edge of the tooth and travels progressively across the face. This reduces the shock due to the sudden transfer of the entire tooth load from one tooth to the next such as we have with spur gears.

One objection that has been raised to the use of helical gears is that the end thrust developed will cause excessive flange wear of the armature bearings. On a 7½-deg. helix, such as is used on our helical gears, the end thrust does not exceed 13 per cent of the total tooth load and, due to sliding friction between the teeth in the direction of the thrust, it is found to be somewhat less than this in actual practice. Actual results of operation on many properties where helical gears are used show that the end wear is no greater on motors fitted with helical gears than on those having spur gears on the same type of cars in the same service.

Electrically, the modern railway motor represents as much capacity per pound as it is possible to give with present materials and giving due consideration to the necessity of producing a motor that will stand up mechanically under the very severe service and frequent abuse to which it is subjected in the railway field. We believe that there is no piece of apparatus which receives as much abuse and is as well able to stand it as the modern railway motor.

American Construction Council Organized

FRANKLIN D. ROOSEVELT, formerly Assistant Secretary of the Navy, was elected president of the American Construction Council on June 20 at the end of a two days session held in Washington, at which leaders of the construction industry gathered to organize a body representative of all construction elements. John B. Larner, vice-president of the American Bankers' Association and president of the Washington Loan & Trust Company, was elected treasurer.

During the two days session just concluded, 200 architects, engineers, general contractors, sub-contractors, construction labor, material and equipment manufacturers and dealers, financial, bond, insurance and real estate interests, public utility construction departments, federal, state, county and municipal associations have been meeting to consider what can be done to put the construction industry as a whole on a higher plane and to determine ways and means of working together to that end.

The immediate program of action will be in the hands of the officers and an executive committee made up of representatives of the different interests concerned. Those members of the committee representing public utility construction are: Gano Dunn, New York; Francis Blossom, New York; Joseph H. Alexander, Cleveland, and C. H. Markam, Chicago. The engineers are represented by Charles T. Main, Boston; Peter Junkersfeld, New York; Bion J. Arnold and Charles F. Loweth, Chicago.

American Association News

Recent Engineering Association Committee Activities

AS JULY 1 approaches, the date when committee reports are due to be in the hands of Executive Secretary J. W. Welsh, committees are meeting to put the finishing touches upon their year's work. Among meetings held within the past few weeks were those of the committees on way matters, power distribution, equipment and heavy traction, all of the Engineering Association.

Way Matters

The committee on way matters met in Quebec on June 1 and 2. Those present were W. F. Graves, chairman; H. H. George, E. B. Entwisle, E. M. T. Ryder, J. H. Haylow, C. F. Gailor, W. W. Wysor and H. Fort Flowers.

The committee voted to approve the action of the previous meeting in disapproving the plan for the standardization of frogs for double-track branch-offs shown in Appendix "A" of the 1921 report, as in the opinion of the committee it does not have sufficient advantages to warrant its adoption as recommended practice.

Mr. Ryder submitted for Mr. Angerer blue prints of plans for three standard car-clearance easements. Two of these the committee decided to recommend for adoption at the coming convention, and the third it recommended be referred to the 1923 committee for further study.

The committee reached the conclusion that no further progress could be made on the subjects of curved contours for new wheels and design of wheel treads and flange contours as at present assigned, and voted to recommend to

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the executive committee that a special committee representing all interests be appointed to study the subject further.

Mr. Wysor, chairman of the subcommittee on arc-welded joints, submitted a drawing of the proposed rotary testing machine for welded joints, and several suggested plans for financing the construction, installation, and operation of this machine were discussed at length. (A preliminary statement regarding this machine, with illustrations, appeared in the June 17 issue of this paper.)

The final report of Mr. Wysor's subcommittee was also approved for inclusion in the way committee's report, with Mr. Wysor's report of May 8 on the testing machine as an appendix.

The specifications for tie rods, submitted by the subcommittee on sundry track materials, were referred back to the subcommittee for revision. Other sundry track material specifications were approved and will be published in the committee's report.

The final reports of the following subcommittees were also received and approved for inclusion in the general report: Subcommittee on revision of girder rail specifications, presented by Mr. George; subcommittee on design of substitute ties, presented by Mr. Baker; subcommittee on wood preservation, presented by Mr. George; subcommittee on design of track construction in paved streets, presented by Mr. Wysor, and subcommittee on revision of existing standards, presented by Mr. George.

The committee finally voted that an expression of appreciation and thanks be extended to W. J. Lynch and R. M. Reade of the Quebec Railway, Light & Power Company for courtesies shown the committee during its visit to Quebec, which was timed to coincide with the annual convention of the Canadian Electric Railway Association

EQUIPMENT

A well-attended meeting of the Equipment Committee was held at the association headquarters, New York City, on June 1. Those present were R. H. Dalgleish, Capital Traction Company, Washington, D. C., chairman; W. S. Adams, J. G. Brill Company, Philadelphia, Pa.; H. A. Benedict, Public Service Railway, Newark, N. J.; L. J. Davis, Brooklyn (N. Y.) City Railroad; Stewart Hazlewood, Midvale Steel & Ordnance Company, Philadelphia, Pa.; J. M. Hipple, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; A. J. Miller, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.; E. D. Priest, General Electric Company, Schenectady, N. Y.; P. V. C. See, Northern Ohio Traction & Light Company, Akron, Ohio; C. W. Squier, ELECTRIC RAILWAY JOURNAL, New York, N. Y.; R. W. Steigerwalt represented C. F. W. Rys, Carnegie Steel Company, Pittsburgh, and Albert Scheer, Jr., of the Public Service Railway of New Jersey was present by invitation of the committee.

The various subcommittees made their final reports on the subjects assigned for consideration. These were discussed by the committee as a whole and the final drafts for inclusion in the committee's report were decided upon.

POWER DISTRIBUTION

The power distribution engineers met in New York City on June 6, with Chairman M. B. Rosevear and thirteen out of the other fifteen members in attendance. This was a remarkable showing as the membership is scattered over a wide area.

It was decided that subcommittee chairmen should prepare abstracts to precede the body of their reports. Mr. Rosevear asked all members to submit names of desirable men for members of next year's committee. He also requested subcommittee chairmen to submit lists of names of men to be asked to give prepared discussion of their reports at the convention.

Possibly the most important single topic discussed related to the crossing specifications and the "Safety Code." Mr. Eaton covered the subject in detail, including the proceedings of the American Engineering Standards Committee conference of March 2. (See ELECTRIC RAILWAY JOURNAL, Feb. 18, page 288; March 11, pages 393 and 414.) Mr. Harte offered also the following alternative recommendations, which were adopted, one or the other to be used, depending on the action which may be taken at the next meeting of the A.E.S.C.:

"1. If the recommendations of the March 2 conference are adopted: Pending the completion of the work of the sectional committee of the American Engineering Standards Committee, which will doubtless result in the adoption of a set of national specifications, we recommend that Manual Section Ds 1c be suspended, and that member companies follow, as a minimum, the requirements of the National Electrical Safety Code.

"2. If the vote to reconsider prevails: The fact that at that time many states were considering individual action on crossing specifications led this association in 1919, in the hope that united action by the electric and steam railway interests might serve to secure unity of action elsewhere, to accept and approve a specification not entirely satisfactory, but which it was expected would be revised as soon as the necessary evidence could be secured.

"The other parties to the specification, however, seemed unable so to proceed; many of the steam roads do not employ it, and in the various state conferences the steam roads have been unable to produce sufficient evidence in favor of its higher requirements to secure its adoption there. The failure of the proceedings before the American Engineering Standards Committee has now removed opportunity for any general harmonizing of this specification and the National Electrical Safety Code, which is now, either substantially unchanged or slightly modified, the standard of most of the states. It is recommended, therefore, that our specification Manual Ds 1c be now withdrawn as a standard, and that pending the preparation and adoption of an American Engineering Standard Crossing Specification the National Electrical Safety Code requirements be followed."

On the subjects of wood preservation and reclamation of poles, Mr. McVittie reported regarding preservation that he does not feel he has sufficient information to draw up a specification. He recommends that he draw up a report and publish therein, for information only, some of the best of the existing specifications, and that the subject be carried over another year, with a suggested line up of procedure for next year's committee. This was approved. Regarding reclamation, his report will include descriptions of various methods of reinforcement now in use.

On the subject of automatic substations, Mr. Jones described the proposed report on this subject, stating that the committee had worked up several alternate schemes for one urban problem which would be included in the report together with the general subject of the operation and control of automatic substations.

Reports from other subcommittees also showed their work to be well in hand.

HEAVY TRACTION

The heavy traction committee met in New York on June 21. Present were chairman S. Withington, L. S. Wells, A. H. Armstrong and H. W. Cope.

The committee went over a table of operating data of electrified sections of steam railroads and arranged for revision in some details. A second table of data of foreign electrifications was also studied. Much interest centered in the bibliography presented in preliminary form last year. It was decided to prepare this year a supplementary bibliography to July 1, 1922, for incorporation in the 1922 report. It will be recommended further that the complete bibliography be revised promptly and reprinted in form convenient for distribution by the association.

Coal Stock Survey Being Made

AT THE request of the Secretary of Commerce, Herbert Hoover, the American Electric Railway Association is sending out a questionnaire calling for information on the tonnage of coal on hand, storage capacity, daily requirements, amount of coal contracted for, names of contractors, grade of coal required, etc., by the electric railway companies. A similar questionnaire is being sent out by the National Electric Light Association and the American Gas Association. It is very important that all railway companies co-operate in furnishing this information to the association headquarters, so that the Secretary of Commerce may be able accurately to judge the position of the public utilities with reference to the coal strike.

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News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

East Bay Safety Council

Formed by Public Spirited Citizens and Employers in Oakland and Berkeley —Local Railway Interested

The San Francisco-Oakland Terminal Railways is taking an active interest in a recently formed East Bay Safety Council, organized in Oakland, Berkeley, Alameda and neighboring cities to reduce accidents. George H. Harris, assistant to the general manager of the railways company, is vice-chairman of the council, and E. E. Thornton, superintendent of the Key division, is secretary.

The other officers and directors of the Council include representatives of prominent manufacturing companies, chiefs of police of several of the cities covered, a district attorney, a commissioner of public health, a superintendent of schools, a president of an auto trade association, and two daily newspaper publishers. The annual dues to employers are 5 cents for each employee per year for the first 1,000 employees, and 3½ cents per employee over that number, with a minimum of $15 per year. Individual members pay dues of $6 per year. The reception to the plan of the council by the newspapers has been very favorable. An outline of the purposes, issued in the form of an appeal, was published in the "Key System News" for May 18.

The declaration of principles of the council is as follows:

ELEVEN PRINCIPLES SUMMARIZED

1. The Safety Council operates as an individual organization.
2. It is a voluntary, co-operative, non-profit-making, non-political, non-commercial organization of public spirited citizens and employers interested in promoting Public and Industrial Safety, the prevention of accidents and conservation of human life.
3. It is the purpose to co-operate with the constituted authorities in the furtherance of the principles of safety.
4. It shall be the policy of the Council not to endorse a private commercial interest or candidates for political office.
5. Any legislative matter, policy or principle in which the endorsement of the Council is requested shall be first referred to the proper committee which committee shall report its findings before the Executive Committee will take final action.
6. The Council shall constantly strive to impress upon the community that the saving of life and lessening of cripples and orphans by reducing the causes of accidents is (first) humanitarian and (second) good business.
7. The Council has as its object, the reduction of accidents and fatalities in industry and on the streets by creating an atmosphere of safety and of better co-operation between the pedestrian and the driver of the motor vehicle, thereby effecting a great economic as well as social saving to the community.
8. The Council's program contemplates activities to be carried on through the homes, schools, churches, industries, railroads, public utilities, civic organizations and other agencies in this manner developing community interest in the prevention of injury and death, the avoidance of fire waste and promotion of health.
9. The Council has as one of its principal elements of work the education of the children in the schools to be safe and to help to overcome the hazards of our streets.
10. The Council endeavors to secure co-operation between the police, the courts, the public; obtaining better laws and proper enforcement of existing laws and regulations affecting traffic conditions on the streets, vitally necessary to a safe community.
11. The Council dedicates itself to the proposition that it is safer to think first than to suffer afterward, hence it seeks to eliminate accidents and fire hazards by inculcating through propaganda and instruction, this important feature of Safety Work in the mind of every man, woman and child.

No Irregularities Among Legislators

The Suffolk County Grand Jury has investigated the passage of the public control act governing the operation of the Boston (Mass.) Elevated Railway under the auspices of the State and reports that there is no evidence of irregularities warranting any indictments, but it says some of the legislators were indiscreet in their investments at the time of the passage of the act in 1918. This may end a long and bitter agitation against the operation of the road under the present arrangement with the trustees.

Recommends High-Speed Lines

In response to an invitation of Mayor Moore at the suggestion of the Chamber of Commerce to discuss transit extensions Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, urged additional high-speed and surface lines as an essential to the uninterrupted growth of the city.

In speaking of the Roosevelt Boulevard line as a real need, he said in part:

Roosevelt Boulevard line, together with all other city-planned high-speed and surface lines, will not, at first, earn sufficient to pay operating costs. The city at large, the abutting property holder and the city's taxable values will secure great advantage from added transit.

What P. R. T. is able to accomplish will be largely measured by the degree of co-operation which it receives from the city in making its planned economies effective, and by the amount of return which it would be required to pay on city's construction costs. The city, by use of its credit and with practically no loss in borrowing power, could finance added transit, create increased taxable values, and in the end own the property made possible by use of city's credit.

Roosevelt Boulevard line will require property approximating $400,000 in value, which P. R. T. could supply, but P. R. T. cannot provide the money to build the tracks and overhead on the Roosevelt Boulevard, which would require an expenditure of approximately $1,000,000 on the part of the city.

The Mayor in concluding the conference said that he would consider the Mitten proposal in conference with the city solicitor, transit director and president of the Council. Mr. Weglein, president of the Council, stated later that service to the people would be the first consideration in the transit conferences.

Wage Scale Extended

If Stabilizing Fund Is Decreased During Next Six Months Toledo Employees Must Accept Cut

After less than two days negotiation between representatives of the platform men and the officials of the Community Traction Company, Toledo, Ohio, the present wage scale has been extended for another year with certain provisions which tend to make the men partially responsible for boosting the earnings of the company during the next six months. The scale is 45 cents an hour for the first three months, 47 cents an hour for more than three and under nine months, and 50 cents for those in service more than nine months. The proposition was made to the men that should the stabilizing fund, which is now at a little more than $127,000, not decrease during the next six months present pay would continue.

If the fund falls, however, from decreased earnings the men shall at the end of six months go back to the 1919 scale of 42, 44 and 46 cents an hour. And wages of shopmen and track workers would be cut 8 per cent on Nov. 1 if the fund falls. It is not likely that the fund will decrease as good gains have been made recently.

The men immediately brought pressure to bear upon city officials to route the buses so that they could not compete with the street railway lines.

IMPROVEMENTS PLANNED

Materials have been ordered to start work upon the track improvement program which will require the expenditure of more than $500,000 on the work mapped out for this summer. The city will pay for the repaving to be done between the rails and on this work will spend about $100,000. Although the Doherty interests are required by the terms of the service-at-cost ordinance to provide capital for these improvements, or forfeit a block of bonds, that form of financing will not be attempted at the present time. According to the ordinance that method would mean the issuance of 8 per cent preferred stock for the money. The whole matter will be carried along as floating indebtedness by the company until the security market is more favorable for marketing the preferred stock.

There is about $127,000 in the stabilizing fund which can be utilized for this purpose. Then there is nearly $70,000 in the hands of the sinking fund trustees which can be used also in paying for the work. Six per cent notes will be given for some of the materials. Commissioner W. E. Cann believes that the improvements will soon

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pay for themselves in increased operating efficiency. One-man cars will be placed in operation on the Bancroft line on July 1 and others will be constructed for one-man operation in the near future. In the new wage contract the one-man cars are approved as being an inevitable step in street railway progress. The wage for operators of these cars is placed at 55 cents an hour.

In his report to the board of control covering May operations of the Community Traction Company, Commissioner Cann indicated that $11,896 had been earned as a surplus for the fare stabilizing fund and that $1,033 in interest on the bank balance had been added to bring the total to $127,325 at June 1. In addition to the regular payment of $17,708 made monthly to the sinking fund for municipal ownership of the system there was added $745 interest on bonds acquired by the sinking fund trustees and $767 interest on funds not yet invested in bonds.

Gross revenue for May was $304,412 as compared with $304,306 for April. The report shows that the decline in the number of revenue passengers from an average of 164,412 a day in April to 160,935 in May more than offset the advantage of an additional day's revenue. Operating expenses for May were $166,060 as compared with $168,425 for April. An additional allowance of $5,000 for maintenance was provided during May. During the month there were operated 646,862 car miles as compared with 620,496 car miles for the previous month. There were carried 4,990,539 revenue passengers as compared with 5,341,791 for May, 1921. This is a decrease of 351,252. In spite of this there is a surplus for May of this year as against a deficit of $56,270 for May, 1921. Daily average of revenue passengers for last month is 160,985 as against 172,316 for May of last year. Commissioner Cann said that indications so far for June are that the number of daily average revenue passengers for the month will be 162,000.

The commissioner reported that a new power contract between the Community Traction Company and the Toledo Edison Company had been disapproved by him after its submission to him last February and that with the consulting aid of Victor Phillips, Cleveland, a new contract based upon growth for the city and development of the lines had been submitted to the company. No action has been taken on the power question as yet.

Accident Prevention Meeting Arranged

A mass accident prevention meeting was scheduled by the Cleveland (Ohio) Railway for June 21 for all employees who are members of the accident prevention committee, organized several months ago. Besides the addresses and motion pictures, talks will be given to the men on accident prevention, loyalty to the company and courtesy to patrons. President J. J. Stanley will open the meeting and Joseph H. Alexander, vice-president, will preside. General Manager Emerson and Superintendent Noonan will deliver the addresses.

Following this meeting, Superintendent Noonan will conduct twenty-eight others during this month and July for employees in all departments. The men are paid for the time spent in attending these meetings, which are regarded as part of the company's business. Since Jan. 1 the boarding and alighting accidents from moving cars have been reduced almost to zero through the co-operation of the motormen and conductors in not opening the doors while the cars are in motion.

Service Cut by Power Failure

Many of the passengers on the elevated and the surface lines controlled by the Interborough Rapid Transit Company, New York, were inconvenienced on the evening of June 19 through the failure of the power supply of that company which necessitated shutting the lines down temporarily.

H. N. Latey, the Transit Commission's engineer of equipment and operation, after an investigation reported the direct cause of the breakdown was the failure of a 30,000-kw. unit in the Seventy-fourth Street power station, due to a short circuit on the collector rings, which occurred at 3.20 p. m. At the time one of the 30,000-kw. units at Seventy-fourth Street was out of service for inspection and repairs and another similar unit in the Fifty-ninth Street power station was out of service on account of reconstruction being carried on by the General Electric Company. Failure of the second unit in Seventy-fourth Street, therefore, eliminated 90,000 kw. from the power facilities ordinarily available.

Frank Hedley, president and general manager of the company, summoned to a conference with the Transit Commission to explain the service interruption, admitted that the Interborough and its allied lines will have to depend probably for two weeks or more upon the emergency equipment of the Seventy-fourth Street power station, which proved inadequate to the load thrown upon it Monday. That period of time, he thought, would be required to restore the damaged generator to first-class operating condition.

"We will be skating upon thin ice so far as coal stocks and adequate power are concerned," said Mr. Hedley. The president of the Interborough conceded that in the last ninety days the company had been forced to buy 60,000 tons of soft coal in the open market to reinforce its regular contract supplies from the Berwind-White Coal Company and the Consolidation Coal Company.

Much of this open market, or "spot" coal, he declared, is of an inferior steam making quality.

The subway lines were not affected by the shutdown.

Will You Do Your Part to Save a Convenience?

The value of a thing is often learned by its loss. That is the predominant thought expressed in "Who Pays the Bill," a pamphlet compiled by C. J. Ferneding, president of the Dayton, Springfield & Xenia Southern Railway, Dayton, Ohio. The pamphlet is a message to all patrons of the railway lines soliciting their protection for the railway service against unwarranted and unnecessary bus competition. Contending that the people will realize what a convenience they have lost with the abandonment of the electric line, he cites the example of the communities of Bellbrook and Spring Valley, which failed to support the branch line of the Dayton & Xenia Railway and accordingly its abandonment was ordered. He says:

> Today these communities would gladly pay two or three times what this service cost them because they have learned its value by its loss and must now pay for inferior bus transportation four or five times what the rail transportation cost them.
>
> Right relations between the transportation company and the public involve something more than laws, city ordinances and court decisions. They depend upon understanding and co-operation between the public and the companies and each needs at times to be reminded of its obligations toward and its dependence upon the other.

He said that the traffic between Dayton and Xenia was sufficient for only one transportation line—an electric line and a bus line could not both survive. Claiming that where there is only enough traffic for one the effects of dividing patronage between two are apparent, he pointed out:

> Every fare paid to the bus line is taken from the electric line and hurts it just so much. If enough of its income is diverted to the bus line to make it impossible to meet its charges it must quit.

In conclusion, Mr. Ferneding urged the reading of this pamphlet and asked the readers to judge whether those who were patronizing the buses and trucks were acting for the best interests of the public and for their own best interests.

More than 5,000 copies of "Who Pays the Bill" have been distributed. They have met with very favorable comments.

Arbitration Will Decide Wage

By an agreement between the Berkshire (Mass.) Street Railway and the trollymen's union on June 19 the question of the new wage scale to replace that which expired on June 1 was to be submitted to an arbitration board of three. Company and men will each appoint an arbitrator, the third to be some person acceptable to both sides. It is hoped to reach a prompt decision and avert all danger of a tieup. Under the old scale the maximum pay is $4.80 a day for blue uniform men. The company wanted to reduce the wages 10 per cent, and the men sought a 10 per cent increase.

Several conferences were held recently and the trolleymen rejected a proposal to leave the question to a board consisting of the district court judges of Berkshire County.

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Fresno Has New Franchise

Service-at-Cost Ideas Applied to Fifty-Year Grant to California Road—Railroad Commission Approves Exchange of Obsolete and Undesirable Term Franchises for Modern Indeterminate Grants

THE LAST steps have been taken in connection with the new franchise in Fresno, Cal. The grant was passed by the Council on Feb. 16. It was approved by the Chamber of Commerce of Fresno on April 19. The Railroad Commission sanctioned the grant on May 3 with certain reservations. The company has since accepted it. The date of acceptance was May 13.

The new agreement was under negotiation many months. It amounts to an indeterminate permit, for although the ordinance is drawn for a period of fifty years, it is to be renewed at the end of that time if the property has not been purchased by the city. If the city elects it may purchase the property of the company at the end of any ten-year period by paying for it at its physical valuation at the time.

The company is relieved of all paving obligations in so far as it is possible to grant such relief under the laws of the State of California. It is also relieved of all franchise taxes. The company is assured of a fare that will return operating expenses, taxes and 8 per cent on a valuation to be determined by the Railroad Commission. In short, the integrity of the investment is assured, as is a return of 8 per cent upon the valuation regulated by the increase and decrease in fares.

Some of the more important provisions of the franchise are as follows:

That the right as provided by law is reserved, should the need of the city require it, to grant franchises to other persons to construct, operate and maintain street railways or other methods of transportation within said city subject to the laws of the State of California, provided that this clause shall not be construed to deprive the company of the right to lawfully oppose the granting of any such franchise where its interests are affected thereby.

The city of Fresno will not, except as obligated to do so by the laws of the State of California, require the company by or under any proceedings hereafter to be taken by the "city" to pave, repave, macadamize or remacadamize any part of any street over which the company is now operating lines or over which it may hereafter operate lines, in connection with paving under proceedings hereafter taken, provided, however, the company shall maintain and keep in repair all paving between the rails and tracks and 2 ft. on each side thereof.

That the company shall on or before Feb. 15 of each year file with the City Commission and the Railroad Commission a full and complete report in such form and containing such matters as required by the Railroad Commission of the State of California and upon such report, subject to the approval of the Railroad Commission of the State of California, the rates of fare to be charged on the lines of this company, in the city of Fresno shall be such as to allow said company to earn gross amount sufficient to pay "operating expenses and taxes"; and a return at a reasonable rate per annum upon the "capital value" as such terms are defined in this franchise.

When it shall appear that the existing rates of fares are giving a return in excess of a reasonable return per annum as evidenced by the earnings of the whole or proportionate part of the preceding calendar year, during which time said rates were in effect, then on or before Feb. 15 of next calendar year the company shall notify the Railroad Commission and the commission, and if approved by the Railroad Commission it shall lower such fare 1 cent, such reduction to be effective April 1 following; and if the rates of fares shall fail to yield a reasonable return during the period and under the conditions above specified, then the company shall on or before Feb. 15 of the next calendar year notify the Railroad Commission and the commission, and unless objected to by the Railroad Commission shall increase the rate of fare 1 cent, which increase shall be effective April 1 following.

It is the intention that the rate of fare shall not be changed more often than once in twelve months. Except as from time to time otherwise determined by the Railroad Commission as measured by the rates of return found reasonable in connection with the operation of public utilities, such reasonable rate of return shall be deemed to be 8 per cent per annum. Nothing in this franchise shall be construed as limiting the right now accorded by law to any person or persons from presenting any applications to the Railroad Commission as are now allowed by law to be so presented to such Railroad Commission.

That the commission may by an affirmative vote of four-fifths of its members declare an extension of the service of the company to be a public necessity and call upon the company to make such extension and upon the failure of the company within a reasonable time to be fixed by the commission to make such extension, the commission may make an application to the Railroad Commission asking for an order requiring such extension to be made. The matter of the reasonableness of such extension and the terms thereof shall be left to the jurisdiction and the order of the Railroad Commission and should said Railroad Commission order said company to make such extension, it shall be its duty to, and it must, make such extension within a reasonable time, provided that, if the company is dissatisfied with said order, and appeals, or seeks a review in the courts, it shall not be required to make such extension until the final determination that said order, or such modification thereof as is made, shall become final. All extensions shall become a part of the aggregate property of the company and shall be operated as such and be subject to all the obligations and reserved rights contained in the city charter and this franchise and shall terminate herewith and be terminated as provided herein and the city does hereby grant to the company the right to construct and operate such additions and extensions as the city shall by ordinance require the company to make subject to all the conditions and obligations herein and will, if deemed necessary or desirable by the company, by grant, again grant such authority.

That in the event of the extension of the corporate limits of the city, so as to take in other and additional territory not now a part of said city, any franchise to operate a street railway or any part thereof, held or claimed by the company in or for any part of such annexed territory shall thereupon be surrendered to said city, and the rights and obligations of this resettlement franchise shall thereupon automatically extend to such additional territory and to said railway, and any part thereof situated therein, and the value of said railway property so included in said territory shall likewise be added to the capital investment of said company within said city, and be considered in the fixing of rates within said city and in fixing the valuation, in the event the city shall elect to take over the property of the company.

That this resettlement franchise shall not be, in whole or in part, nor the railways constructed or operated thereunder, leased, sold, assigned, or otherwise transferred, without the express consent of the city, evidenced by an ordinance, passed by the commission.

That this resettlement franchise is granted upon the express condition that the city shall have the right to terminate this franchise, and to acquire by purchase, or otherwise, all property of the company within said city used and useful in the operation of the railways under this resettlement franchise, and all extensions hereafter granted and made, and such other property within said city of the company as shall be determined by the city to be of prospective usefulness in the public service, ten years from the adoption of this ordinance, and upon each ten-year period thereafter, upon giving the company six months' notice of its intention, at a valuation of the said physical properties of the company, agreed on between the company and the city, or if they cannot agree, at a valuation to be lawfully fixed and determined by the Railroad Commission. Should the city elect to terminate this franchise and acquire said property, if the city and company cannot agree, the city shall promptly apply to the Railroad Commission for an appraisement and valuation of said properties.

The valuation so lawfully fixed shall be conclusive on the parties, and if the company shall be operating lines of railway outside of the city, but in conjunction with its lines within the city, and shall have a bonded indebtedness hereafter covering the whole, such Railroad Commission shall have the right, on demand of the city, to apportion the bonded indebtedness as between the properties within and without the city. The city, if the valuation of said property within the city shall exceed the bonded debt, or the part thereof apportioned to the property within the city, may assume the bonded debt, as a part of the purchase price, and pay the difference in money.

The city must, within one year after the valuation fixed by the Railroad Commission has become final, or in event of litigation within one year after final determination thereof, either pay to the company, in lawful money of the United States, the value fixed by said Railroad Commission, or assume the bonded indebtedness and pay the company such difference, and, provided further, however, that any and all mortgages or deeds of trust hereafter given to secure the lien of any bonded indebtedness shall contain suitable provisions to carry into effect the clauses contained in this franchise pertaining to the settlement and division of such bonded indebtedness, but, in reference to any deeds of trust or mortgages now existing upon said properties given to secure such bonded indebtedness, the said company shall, in the event of sale, at the request of the city, reduce said bonded indebtedness to a sum not in excess of $30,000, and, in the event of such sale and purchase by the city, the said city shall have the right and privilege to retain a sum sufficient to cover such bonded indebtedness with interest and to retain the sum until such bonded indebtedness has been liquidated by said company and upon such liquidation, the said sum with interest so retained shall be paid to said company.

Any extensions or betterments made by the company after the appraisement, and before completion or purchase, shall be added to value fixed by the Railroad Commission and become a part of the purchase price, but no such betterments or extensions in excess of a total of $1,000 shall be made without the consent of the commission. Upon payment in full by the city to the company of the purchase price, or payment partly in money and partly by the assumption of indebtedness, the company agrees to execute necessary surrenders, grants, releases and conveyances, and to deliver to said city possession of said property.

In fixing the valuation of the property owned by the company for any of the purposes considered in this franchise, only the value of the property devoted to public service shall be included, provided, however, in case of purchase by the city, property of prospective public use may be included at option of the city.

It is further agreed that any valuation of the properties of the company by the Railroad Commission for the purpose of fixing rates shall not be binding upon nor estop either the Railroad Commission or the city, whether fixed after a contest or adjudication or by consent of said city, for any purpose except that of fixing rates, and when and if the city demands a valuation for purpose of acquisition, the Railroad Commission shall fix and appraise the physical properties of the company anew

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as they then are, and no prior adjudication or determination shall be conclusive.

The city reserves the right, in the event that the present law of the State of California in reference to taxation of public utilities should be abandoned, to levy and collect reasonable taxes and license fees, if authorized by the laws of the State of California to do so.

The term of this franchise and of all the rights and privileges hereby granted, shall be fifty years from and after adoption of this ordinance, provided that the city shall have the right to, and such right is expressly reserved, terminate this franchise whenever the city determines to acquire the property of the company ten years after the adoption of this franchise, and at the end of each ten year period thereafter, upon giving the company six months' notice thereof, and the company, by its acceptance of the provisions, conditions and limitations of this franchise, assents thereto and agrees to transfer said properties in accordance with the provisions in this ordinance contained.

Prior to the passage of the ordinance, the Fresno Traction Company operated under what is known as short-term franchises, ranging from six to thirty-nine years, all of which carried stringent requirements with respect to paying for paving, bearing taxes, etc. About two years ago the city of Fresno requested the company to spend more than $100,000 for paving, most of which was in outlying districts of the city and along streets with franchises running for thirty-nine years. Between these streets and the business section of the city, however, the company had franchises that ran for only six years. There was no way that the city could assure the company that the shorter-term franchises would be extended.

Future Financing Assured

Under the circumstances it was, of course, impossible for the company to obtain money to carry out such improvements. After a very thorough investigation of the entire matter, including an inquiry into the necessity for electric railway extensions so as to permit the city to expand, the City Commission appointed a very representative committee of business men further to investigate the needs of the city and to report on the measure of relief that might be extended to the railway. This committee recommended an indeterminate franchise, leaving the terms of the franchise entirely up to the City Commission and the company. After a great deal of discussion the resettlement franchise was granted.

The Railroad Commission, in a decision announced on May 4, authorized the company to substitute the resettlement franchise for the franchises that existed previously and to subject the new franchise to the lien of an outstanding mortgage aggregating $680,000.

As has been indicated previously the new franchise is of the cost-of-service type with provision for an annual adjustment of fares upon an earning basis and also provides for the acquisition of the traction properties by the city at ten-year intervals. In pointing out that these provisions are not directly involved in the present proceedings the commission reserved its right under the Constitution and the Public Utilities Act not to be bound by them.

In discussing the franchise in general the commission, in an opinion written by Commissioner Chester H. Rowell, said:

> This commission has on several occasions expressed its opinion of the desirability, from the standpoint of the public, of exchanging obsolete and undesirable term franchises for more desirable and more modern indeterminate franchises. While under its charter, Fresno is not in a position to grant a full indeterminate street railway franchise, the franchise before us represents an improvement over the franchise to be surrendered and the city may under the new franchise look forward to improved street car service, able to keep pace with the rapid growth of the city. From the standpoint of the company's bondholders the franchise exchange is a desirable step and one tending to enhance the value of the security.

The provisions in the franchise referring to rate making are held to be recommendatory, as the state law, the commission points out, gives it paramount jurisdiction in all rate matters.

Commissioner Comments on Settlement

In commenting on this feature Mr. Rowell said:

> In my opinion, the most that this section of the franchise can accomplish is to indicate to the commission the basis on which the city of Fresno is willing to have this commission proceed in the fixing of street railway fares and the extent of the profit which it is willing the company should earn from its street railway operation. Under the constitution of the State and under the Public Utilities Act this commission has sole jurisdiction in the matter of the fixing of rates. It follows that nothing contained in this franchise can absolve the commission from its duty to fix fair and reasonable rates and it must in the fixing of such rates be controlled, of course, by the facts as they will be developed in any particular case under its own methods of investigation and in its own best judgment. It must be understood, therefore, that the commission cannot be bound in any rate proceeding by definitions or interpretations of terms such as "capital value," appearing in the resettlement franchise. This matter was discussed in the hearing by the presiding commissioner with counsel for the city and for the company and there appeared to be general agreement as to the paramount rate making authority of this commission.

The decision expressly reserves for future consideration the question of the validity of the section of the franchise providing for the acquisition of the railway properties by the city at ten-year intervals.

Wage Reduction Announced

The International Railway, Buffalo, N. Y., announces a wage reduction of 2½ cents an hour for all platform men employed on its lines, effective July 1, with corresponding adjustments in the hourly rates of all other employees. This not only applies to the local lines of the International in Buffalo, Niagara Falls, Lockport, Tonawanda, North Tonawanda and Lancaster but to the interurban lines between these points.

At present the platform men of the International are paid a flat rate of 55 cents an hour; electric and truck men employed in the carhouses, 47½ cents an hour, and car washers, 40 cents an hour. Last August the International reduced the wages of its platform men from 60 to 55 cents an hour with a corresponding adjustment in the wage scale of other employees. No notice of the new wage scale was given the locals of the Amalgamated Association, but notices were posted in all carhouses and stations.

News Notes

Can't Use Trolley Poles for Radio Stunts.—The Toledo Bowling Green & Southern Traction Company, Findlay, Ohio, has forbidden users of radio equipment to attach aerials to its poles.

Railway Freed from Paving Expenses.—By a vote of 1,103 to 719, the citizens of Mankato, Minn., voted at a special election to change the Mankato Electric Traction Company's franchise so as to free the railway from all paving costs, assessing against the property owners the cost of paving on the car roadbed. The railway company will continue to be liable for the cost of street repairs.

Railway Service Suspended.—Mexico City is without electric railway service as a result of a strike of the employees of the Mexican Tramways. A general strike is expected. The manager of the company, which is British owned, claims that he has granted the last concession to the workers and that he is prepared to shut down the railway service for an indefinite period.

Must Pave or Remove Tracks.—The Board of Public Utility Commissioners has granted the petition of the Borough Commission of Vineland, N. J., for an order to the Millville Traction Company etiher to pave along its tracks in Landis Avenue or remove the rails. The company is given thirty days in which to comply with the order. The borough is paving Landis Avenue, the principal business street, but the trolley tracks interfere with the work.

Strike Expense Heavy.—The Transit Commission recently forwarded to Corporation Counsel O'Brien the report of an audit of its accountants in connection with the strike on the Brooklyn Rapid Transit system in 1920. According to this report the total expenditures to operate on the Brooklyn Rapid Transit system during the strike amounted to $2,483,483. This figure corresponds very closely with the estimate of $2,567,393 contained in the report of Receiver Garrison made to the court and noted in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 19, 1921, page 382.

No Wage Agreement Reached.—Wage negotiations with the employees of the Chicago Surface Lines have been held frequently but no offer has yet been made public. Whatever scale is finally agreed upon will become effective on July 2. Union officials have suggested that the city donate its share of the net receipts toward the companies' loss of revenue so the cut in wages will not be so severe. No early action is likely on this suggestion because the City Council contemplates an early adjournment.

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Financial and Corporate

Reorganization Approved

New Company at New Orleans Will Be Known as the New Orleans Public Service Corporation

The New Orleans Railway & Light Company is to be rechristened the New Orleans Public Service Corporation and its outstanding capitalization is to be reduced from approximately $70,000,000 to between $45,000,000 and $50,000,000. This is in accordance with the reorganization plans adopted on June 12 by the several committees, representing various classes of security holders, says the New Orleans *States*. The details of the plan were released for publication on June 19.

The reorganization plan is the outcome of more than three years of negotiations between the city and the security holders to put the company on a sound financial basis and improve service. It represents a final agreement between the different mortgage holders of the company as to what they get out of the scramble.

The new plan will be presented to the United States court for approval. The plan calls for a foreclosure of the general mortgage of the company and the establishment of the new public service corporation. The court, it is understood, will approve the plan and the necessary court orders will be made and the new company will start operation some time this fall.

The new company will institute 7-cent car fare and $1.30 gas under an agreement with the city.

Three outstanding features of the reorganization plan are: The $20,000,000 common stock of the old company is completely wiped out; the new company will be authorized to issue $100,000,000 of new first and refunding mortgage bonds; between $10,000,000 and $15,000,000 of new money will be put into the company immediately.

The reorganization plan will affect the several classes of securities of the company about as follows:

The $11,245,000 underlying securities receive 100 per cent on the dollar.

The $18,502,000 4½ per cent general mortgage bonds will receive 25 per cent in cash, and the balance in new 4½ per cent general lien bonds. The new general lien bonds will be junior to the proposed $10,000,000 to $15,000,000 of first and refunding mortgage bonds.

The $5,010,000 Series "A" 5 per cent bonds will be refunded into new 6 per cent income bonds, on a basis of 84.34 per cent on a dollar. The series "B" junior bonds will be exchanged on a basis of 435 French francs for 516 francs, or $55 in new 6 per cent income bonds for every 516 francs at the option of the holder.

The present preferred stockholders will receive all of the stock of the new company, to be distributed "pro rata." The amount of new common stock to be issued by the new company will be determined by deducting all of the debts of the company from the valuation figure of $44,700,000 fixed by the city. The amount will probably be about $5,000,000.

Receiver certificates, taxes, car purchase certificates, etc., will be paid out of new money to be put into the company.

More than 90 per cent of the bonds have been deposited with the committee, and an extension of time made to July 1 for additional deposits. No bonds will be received after that date. Coupons due on July 1 will only be handled by the depositaries on all bonds previously deposited with the committee.

The terms of the ordinance under which the company will operate in the future and the general plan for the financial reorganization of the company were reviewed at length in the ELECTRIC RAILWAY JOURNAL for May 6, pages 761 and 765.

Twenty-fourth Report Submitted

At the twenty-fifth ordinary general meeting of the British Columbia Electric Railway, Vancouver, B. C., held in London in February of this year, the twenty-fourth annual report of the directors with respect to operation for the year ended June 30, 1921, was read. The chairman in the annual address said that the statement submitted showed that the revenue for the year had been well maintained, which justified recommending the declaration of final dividends.

The gross earnings for the year ended June 30, 1921, which exceeded $9,500,000, showed an increase of $824,259 as compared with the previous year. This increase was almost completely offset in increased working costs, due mainly to increased wages granted in October, 1920; to increased cost of materials and to increased taxes, so that according to the chairman's statement the net earnings only gained to the extent of $43,929. The development of the territories served is reflected in the traffic statistics. In 1920-1921 the company carried 71,065,275 passengers, as compared with 66,411,030 in 1919-1920.

On the subject of earnings, the chairman said that the net earnings which the company made were not the result of high charges, but were due to a high standard of efficiency and to economical management. In support of this statement he said that the 6-cent fare in Vancouver, Victoria, West Minster and North Vancouver was among the lowest railway charges in Canada.

Will Finance Organization

Electric Bond & Share Will Back Purchase of Memphis Utilities—Improvements Will Result

It was recently announced in Memphis that the Electric Bond & Share Company of New York City would finance the organization of two companies which will buy the property, assets and liabilities of the Memphis Gas & Electric Company and the Memphis Street Railway. This agreement is said to have been reached at a conference of representatives of the companies, New York financiers, receivers and attorneys for the two local companies.

The two new companies will be organized immediately, with the present stockholders and New York financiers having the controlling interest, it was stated by Lovick P. Miles, of the law firm of Wright, Miles, Waring & Walker. Mr. Miles is counsel for the two corporations. Plans for formulating the two companies with as little delay as possible were discussed at the conference. The companies, according to Mr. Miles, probably will be organized in New York City by the Electric Bond & Share Company and then transferred to Memphis.

SEPARATE CAPITAL STOCK AND STOCKHOLDERS

The Memphis Gas & Electric Company will be turned over to one of the new companies about Aug. 15, when extensive improvements will be made, including enlargement of the present plant, H. C. Abell, vice-president of the Electric Bond & Share Company, announced. The financiers had not decided when the property of the Memphis Street Railway would be disposed of to the other company. Those in attendance at the conference held in Mr. Miles' office in the Bank of Commerce Building were: J. K. Newman, Isadore Newman & Son, New Orleans, bankers; H. C. Abell, vice-president Electric Bond & Share Company, New York; T. B. Udum, counsel for the New York Bond Company; Percy Warner, Nashville, capitalist; T. H. Tutwiler, receiver for the Memphis Street Railway; J. T. Ramier, receiver for the gas company; Frank Elgin, receiver for both companies, and Attorney Miles. Mr. Newman is well known in Memphis, having been formerly with the Memphis Street Railway. He was manager of the interests that controlled the company some years ago.

The two companies that are to be organized will be separate, having separate capital stock, different stockholders and different officers, Messrs. Abell and Miles said. Questioned as to what benefits the Memphis public would receive from the local corporations changing hands, the financiers said many improvements would be made in both companies. The gas company will be enlarged, but at this time they would not say what changes would be made in the service of the street car company.

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Dividends Resumed in Philadelphia

Stock of the Philadelphia Rapid Transit Company Placed on a 6 per Cent Basis with Quarterly Payments of 1½ per Cent—$250,000 to Be Divided Among the Employees

T. E. MITTEN, president, explained to the stockholders of the Philadelphia Rapid Transit Company in a statement on June 19 that the result of operation for the year thus far, as evidenced by income account for five months ended May 31, 1922, shows the ability of the men and management to earn 6 per cent on P. R. T. stock. Operating expenses to May 31 include $250,000 for the co-operative wage dividend. He says that the operating economies, as promised by the men, will provide for the full co-operative wage dividend, and will also enable the company to establish higher standards of service to the public.

The board of directors accordingly declared dividends of 3 per cent, or $1.50 per share, payable July 31, 1922, to stockholders of record July 15, viz.:

Quarterly dividend No. 1, for period January-March, 1922, 1½%, or 75 cents per share.

Quarterly dividend No. 2, for period April-June, 1922, 1½%, or 75 cents per share.

In his statement to the stockholders Mr. Mitten explains that the P. R. T. property valuation proceedings in the fare complaint, now before the Public Service Commission, have been in progress for more than two years. He says final determination can be reached only after appeal and judgment of the courts, which will, in the light of experience in comparable cases, consume an even longer period. Meantime the present 7-cent fare with four tickets for a quarter is assured of continuance, under the Public Service Company Law. He says further that the legal standard upon which rates are to be determined is the present fair value of the property devoted to public use and that P. R. T. proved value, at present reproduction costs, is much in excess of the amount required to justify P. R. T. present net income. Mr. Mitten says:

Co-operation of elevated employees has effected marked economy in operation of elevated trains. These saving will be reflected in a higher standard of service. On July 1 new train schedules will be put into effect on the Market Street Elevated, providing a much larger percentage of seats to passengers carried.

Co-operation of surface employees in 1922 has made marked economies in surface operation. Economies in excess of dividend requirements are also to be here reflected in improved service to the public. The ability to operate the number of additional surface cars required depends largely upon the degree of assistance rendered by the city in clearing downtown tracks of vehicular obstruction during rush hours, and also upon elimination of the numerous and extended delays now caused by unloading coal wagons, and by long interruptions to service at steam railroad crossings.

Philadelphia car riders and P. R. T. have both suffered because of continued warfare between city and company. The basis of agreement reached for operation of Frankford Elevated and Bustleton surface line includes an understanding between Mayor Moore, President Weglein of City Council and President Mitten, by which the city government will hereafter co-operate with Mitten Management when city and company interests are mutual.

P. R. T. will operate Frankford Elevated and Bustleton surface line, beginning Nov. 5, 1922, for a period of five years. P. R. T. pays rental of 1 per cent during 1923 on construction cost of Frankford Elevated; rental to be increased 1 per cent annually until a maximum of 5 per cent is reached. This contract may be extended by the city so as to terminate in 1957 with the 1907 city agreement.

Additional high-speed and surface lines, Mr. Mitten explains, are essential to the uninterrupted growth of Philadelphia. Should the city decide to make the original investment required, there still remains the necessity of additional income to offset the operating deficit of the first few years, and to pay such return on city money as may be agreed upon. Mr. Mitten continues:

Increasing the fare would be impracticable, unpopular and of questionable value as a means of increasing net income. The elimination of wasted effort, as represented by unnecessary lines and duplicated service, is therefore essential in building up P. R. T. ability, through these savings, to support added investment.

Mitten Management is not only endeavoring to increase P. R. T. net income, so as to support unprofitable extensions required for city expansion, but in so doing is endeavoring to apportion service to the needs of every district, and to avoid excess service to one district at the expense of another.

Market Street Elevated service west of Sixty-third Street, city limits, is now sufficient to supply a seat for every passenger carried. The attempt of suburban lines to force P. R. T. to run all elevated trains to Sixty-ninth Street is opposed by Mitten Management, because this excess service, costing $150,000 per annum, would reduce the ability of P. R. T. to supply needed service elsewhere.

Mitten Management has consistently opposed duplication of service to Germantown, as contended for by certain complainants. The cost of this additional service, $250,000 per annum, approximates the operating loss estimated to follow first year's operation of the proposed Roosevelt Boulevard line. The Germantown district now receives adequate service at about one-third the fare paid on steam railroads.

Mitten Management discontinued trolley freight on June 1, 1922, because of the inroads of motor-trucks, which have lately been carrying the best paying freight, and for the further reason that trolley tracks

INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT COMPANY

	Month of May		Five Months to May 31	
	1922	1921	1922	1921
Operating revenue	$3,810,296	$3,769,182	$17,593,048	$17,987,696
Operation and taxes	2,742,066	2,699,573	12,611,472	13,253,786
Operating income	1,068,229	1,069,608	4,981,576	4,733,909
Non-operating income	43,406	32,071	213,767	191,492
Gross income	1,111,636	1,101,680	5,195,343	4,925,401
Fixed charges	817,532	816,943	4,094,897	4,100,554
Net income	$294,103	$284,737	$1,100,446	$824,847

PASSENGER STATISTICS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

	Passenger Revenue		Total Passengers	
	1922	1921	1922	1921
January	$3,363,926	$3,552,152	68,147,370	71,205,982
February	3,082,553	3,140,820	62,513,337	63,033,838
March	3,525,522	3,665,427	71,625,943	73,721,200
April	3,514,679	3,559,789	71,430,998	71,797,138
May	3,727,018	3,686,930	75,952,200	74,455,275
Five months	$17,213,698	$17,605,118	349,669,848	354,213,433

Conspectus of Indexes for June, 1922

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	June 1922 **7.04**	May 1922 **7.14**	June 1921 **7.21**	May 1921 **7.24**	**4.84**
Street Railway Materials*	May 1922 **166**	April 1922 **157**	May 1921 **171**	Sept. 1920 **247**	**100**
Street Railway Wages*	June 1922 **212**	May 1922 **213**	June 1921 **226**	Sept. 1920 **232**	**100**
Steel Unfilled orders (Million tons)	May 31 1922 **5.25**	Apr. 30 1922 **5.10**	May 31 1921 **5.48**	Apr. 30 1917 **12.18**	**5.91**
U.S. Bank Clearings Outside N. Y. City (Billions)	May 1922 **12.50**	April 1922 **11.68**	May 1921 **11.06**	March 1920 **18.54**	Av. Mo. 1913 **6.12**
Business Failures Number	May 1922 **1,803**	April 1922 **1,948**	May 1921 **1,326**	Jan. 1922 **2,722**	Av. Mo. 1913 **1,213**
Liabilities (millions)	**48.16**	**72.55**	**58.20**	**105.7**	**24.64**

	Latest	Month Ago	Year Ago	Peak	1913
Eng. News-Record Construction costs	June 1922 **166.6**	May 1922 **164.6**	June 1921 **209.8**	June 1920 **273.8**	**100**
U.S. Bur. Lab. Stat. Wholesale Commodities	May 1922 **148†**	April 1922 **143†**	May 1921 **145†**	May 1920 **272**	**100**
Bradstreet's Wholesale Commodities	June 1 1922 **11.90**	May 1 1922 **11.70**	June 1 1921 **10.62**	Feb. 1 1920 **20.87**	**9.21**
Dun's Wholesale Commodities	June 1 1922 **170.0**	May 1 1922 **168.1**	June 1 1921 **166.0**	May 1 1920 **263.3**	**120.9**
U.S. Bur. Lab. Stat. Retail food	May 1922 **139**	April 1922 **139**	May 1921 **145**	June 1920 **219**	**100**
Nat. Ind. Conf. Bd. Cost of living	May 1922 **154.9**	April 1922 **154.8**	May 1921 **165.7**	July 1920 **204.5**	(1914) **100**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over, except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on street and interurban railways in the United States. †Revised weighting.

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overburdened with passenger traffic should not be used for trolley freight.

PROPERTY IMPROVEMENT

Continued co-operation with the city, in its extensive program of repaving, will require rebuilding upward of 60 miles of track construction during the year. This, together with other necessary expenditures for renewals and improvements, will require approximately $4,000,000.

Appropriations from earnings during 1922 for maintenance and renewals are on the same basis as in 1921. $3,000,000 of the amount so set aside, representing renewal of existing property, will help to meet the $4,000,000 construction budget. The remaining $1,000,000, representing betterments and additions to property will, as heretofore, be financed from the renewal reserve. As against the application of renewal fund moneys for the replacement of existing property, the integrity of present property investment is preserved equally well by the use of these moneys for the acquisition of new and additional property.

This method of financing P. R. T. capital requirements will be used until P. R. T. dividend earnings ability is sufficiently established to make its securities salable under the terms of the 1907 city agreement, by which new capital must be obtained from P. R. T. stock sold at par, or by use of P. R. T. guarantee, which must be sufficiently good to make bonds issued for construction purposes readily salable.

An initial payment of 2 per cent was made in 1916. The company paid 2½ per cent semi-annually from Jan. 31, 1917, to January, 1920. In July, 1920, the dividend was passed and none has since been declared.

Good Showing Continues in Charlottesville

At a recent meeting of the directors of the Charlottesville & Albemarle Railway, Charlottesville, Va., a 3½ per cent semi-annual dividend on the preferred stock of the company was declared, while a 4 per cent semi-annual dividend was ordered paid on the common stock for the six months ended June 30, 1922. The earnings of the company continue to increase rapidly. The company still maintains a 5-cent fare and the passengers carried for the month of May, 1922, totaled 143,657, or a daily average of 4,661. This is an increase over May, 1921, of 11,254. The net surplus for the five months ended May 31, 1922, after the payment of all fixed charges, including the dividend on preferred stock, is $39,280, an increase over the same period in 1921 of $11,727.

Railway Operations Cease

The Bridgeton & Millville Traction Company, operating between those two cities and touching Fairton, Cedarville, Newport, Dividing Creek and Port Norris, ceased operations on its lines on June 15. This did not include the local lines in Millville. Despite every effort on the part of the City Council of Bridgeton, the city has been left stranded without adequate transportation, as the Board of Public Utility Commissioners granted the company's application to abandon on June 15.

Because four different parties have been considering buying the trolley line, the City Council has decided not to grant licenses to a number of bus operators who have applied for permission to run in Bridgeton and to towns formerly served by the trolleys. Hence no adequate bus system is ready to fill in the breach, although a few individual buses will probably be given temporary permits.

The Bridgeton & Millville Traction Company started operation in 1893 and is abandoning its lines at this time because it declares they have not paid for two years. Unless the trolley franchise is purchased at once the city will turn to bus service and probably grant franchises in a short time.

Commission Defers Abandonment

The Public Utilities Commission of Ohio in hearing the application of J. H. McClure, receiver of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, to abandon its branch line from Lima to Defiance decided that operations should be pursued to Sept. 1 to demonstrate the possibilities of this portion of the system being operated without loss. The commission found that this track had been operated for more than five years and that service upon this branch had been maintained at an actual financial loss. The commission in its finding ruled that a verified report be filed on or before Sept. 20, 1922, showing revenues and expenses to Sept. 1, 1922. The same decision was handed down on the application for two other branch line abandonments. This matter has been referred to in a previous issue.

Another Twin City Common Dividend

The Twin City Rapid Transit Company, Minneapolis, Minn., has declared a dividend of 2 per cent on the common stock payable July 1 to stock of record June 15 and the regular quarterly dividend of 1¾ per cent on the preferred stock, payable July 1 to stock of record June 15.

President Horace Lowry in commenting on the declaration of a 2 per cent dividend on the common stock, stated that disbursement was a semi-annual payment in the hope and expectation that it will be possible to keep the stock on a $4 annual basis.

The dividend on the common stock was passed in June, 1918. Including 1919, and up to present time, it has been the custom to pay annual dividend on the common when result of year's operations is known. Last year an annual payment of $4 was made. A $2 dividend was declared last February, which, with the present payment, brings dividends so far this year to $4.

Commission Allows Sale of Equipment Trust Notes

Subject to the approval of a trust agreement and lease, the California Railroad Commission, on June 10, authorized the San Francisco-Oakland Terminal Railways to issue and sell at not less than 99 per cent of their face value and accrued interest $600,000 of 10-year 7 per cent serial equipment trust notes. The proceeds are to be used to pay in part for two new ferryboats, now under construction at an estimated cost of approximately $900,000. The new boats will be of steel hull construction, electrically driven, with a passenger carrying capacity of 3,000. The company's boats at present in service carry a maximum of 2,000 persons.

The equipment trust notes authorized in this order will mature at the rate of $60,000 a year and will be callable at par and accrued interest on any interest payment date. Under the terms of the trust agreement the trustee will hold title to the ferryboats, which will be operated by the company under a lease agreement. This arrangement, it is pointed out, has the effect of obligating the company to pay the notes.

Financial News Notes

Change in Name Effected.—The name of the Richland-Ashland Railway, Petersburg, Va., has been changed to the Richmond-Ashland Railway.

Name of Property to Be Changed—The name of the Arkansas Valley Railway, Light & Power Company has been changed to the Southern Colorado Power Company. The new name is calculated to indicate more clearly the extent and location of the territory served by the company, which comprises five counties covered by 317 miles of transmission system centering in Pueblo.

Co-Receiver Appointed.—William S. Harmon, Columbus, Ohio, has been appointed co-receiver with George Whysall of Columbus of the properties of the Springfield (Ohio) Terminal Railway & Power Company in the foreclosure suit of the Central Trust Company of Illinois. Mr. Harmon was appointed by Judge John E. Sater of Columbus and the entry of his appointment filed in the United States District Court at Cincinnati. The bond of the co-receiver is fixed at $10,000 and has been given.

Change in Ownership Announced.—The Tiffin, Fostoria & Eastern Electric Railway, Tiffin, Ohio, is about to change hands. The Tiffin & Fostoria Railway incorporated June 15, at Columbus, will purchase the property of the Tiffin, Fostoria & Eastern. The deal involves a change in the ownership through the admission of Toledo parties, according to officials. The incorporators are C. F. M. Niles, Justice Wilson and U. G. Denman of Toledo, S. B. Sneath 2d and R. R. Hays of this city. Mr. Niles and Mr. Sneath are interested in the Tiffin, Fostoria & Eastern and Mr. Hays is manager of the line. There will be no change in policy as a result of the change of ownership, it was said by officials of the Tiffin, Fostoria & Eastern.

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Traffic and Transportation

Federal Hearing Conducted

Application of San Francisco-Oakland Terminal Railway to Reclaim Goat Island Discussed

A special commission composed of one representative each from the Departments of War, Commerce and the Navy conducted a hearing in San Francisco on June 12 to give all interested parties an opportunity to present opinions and objections on the application of the San Francisco & Oakland Terminal Railways for permission to reclaim 170 acres of shoal land adjoining Goat Island and to construct thereon a Union Terminal for the use of interurban systems, automobiles and transcontinental railroads.

Major General Lansing H. Beach, chief of engineers, U.S.A., was chairman of the hearing, Admiral A. S. Halstead, commander of the Twelfth Naval District, represented the navy and C. H. Huston, Assistant Secretary of the U. S. Department of Commerce, represented that branch of the government. Col. Herbert E. Deakyne, San Francisco office, Engineer Corps, U.S.A., served in an advisory capacity.

J. S. Drum, chairman of the board of the railway, reviewed the trans-bay traffic situation and the advantages of the proposed terminal, pointing out that the company was quite willing to have other transportation companies join in the project. Edward M. Boggs, consulting engineer for the company, presented the engineering aspects of the plan. In his opinion bridge or tunnel projects that would supplant the ferry service for commuters was in the far distant future and meantime, at a reasonable cost, the present eighteen to twenty-minute ferry trip of 2.85 miles could be reduced to a ten-minute trip of about 1.6 miles. Last year the ferries of the Southern Pacific and Key Route systems combined handled 45,000,000 trans-bay passengers.

Representatives from other companies and neighboring cities expressed interest in the plan but nothing tangible was raised in the form of objections. Based on the hearing and the conclusions reached after a first-hand study of local conditions, the committee is to make recommendation to Congress, by which body final action on the application must be taken.

Railway Concludes Its Case Before Master

The Public Service Railway, Newark, N. J., has concluded the presentation of its testimony before Special Master Haight, sitting at the instance of United States Circuit Court Judges Wooley and Rellstab, to pass upon the question of the continuance of the 8-cent fare. The special master announced that he expected to resume the hearing very shortly with the appearance of the representatives of the Board of Public Utility Commissioners and counsel for the cities. The present 8-cent fare is being collected under a temporary order of the court, pending a full determination of an adequate charge. The 8-cent fare was authorized by the court on an appeal to that body by the railway from the order of the commission fixing the fare at 7 cents.

Record Established on New South Wales Government Tramways

A record number of passengers carried and revenue earned was established during the two Easter weeks of this year on the New South Wales Government Tramways, Sydney, N. S. W. The number of passengers was 13,075,925, against 12,828,639 for the same two weeks a year ago. Only 1,200 passenger cars were available for this and the ordinary city services. The revenue for the Easter weeks of 1922 amounted to £147,764, or an increase of £1,939 over the same period a year ago. These figures were disclosed in a report to the Railway Commissioners by Traffic Manager E. J. Doran giving details of the total traffic handled by the city and suburban trains during these two Easter weeks.

Committee Reports Against Five-Cent Fare

Proposed legislation for the Boston (Mass.) Elevated Railway and some of the other trolley lines in Massachusetts has been so wild that it has not merited serious consideration. When at last it came time for the Legislature to act it put a decided stop to the attempts to hamper the Boston company, leaving the Elevated just where it was at the beginning of the legislative year.

The principal agitation was for a 5-cent fare in Boston. Mayor Curley proposed it in his campaign speeches. He pledged himself to the people to secure it for them, and offered legislation to establish it, finally going so far as to propose a tax levy against all the communities served by the Elevated to cover the cost of operation in excess of the 5-cent fare. Of course no city or town wanted to pay the tax, and the State House was stormed in protest when the matter came up for a hearing. Mass meetings for a 5-cent fare have been common features of the city life, people flocking to them in the false hope that the orators would champion the nickel fare, and petitions have been circulated in the streets and have been signed promiscuously. However, the street railway committee of the Legislature reported against the 5-cent fare measure.

Fare Testimony Submitted

International Railway Must Wait Until the Commission Rules on the Reasonableness of Increased Fares

Evidence tending to show that higher rates are necessary on its interurban lines to make up the net deficit and improve the service was presented to the Public Service Commission at a hearing in Buffalo by the International Railway Company. C. P. Franchot, counsel for the company, showed that while the people of Buffalo are riding for a 7-cent fare, only 5 cents is charged in Niagara Falls, Lancaster, Tonawanda and North Tonawanda and 6 cents in Lockport. Such fares, he said, are inconsistent and inequitable and should be made uniform.

During the first four months of 1922, the deficit amounted to $90,000, the commission was told. This deficit consisted of the net loss to meet fixed charges on property. R. H. Horton, traffic engineer of the Philadelphia (Pa.) Rapid Transit Company, submitted fare schedules from 151 cities of the United States, which showed that 29 communities were paying less than 6 cents; 30 were paying 6 cents; 35 were paying 7 cents; 39 were paying 8 cents; 3 were paying 9 cents and 25 were paying 10 cents.

William S. Rann, corporation counsel of Buffalo, upon the orders of the City Council, has written to the Public Service Commission urging the immediate restoration of the 5-cent fare in Buffalo. It was pointed out that the 7-cent fare or four tokens for 25 cents was granted as a temporary measure and conditions which prevailed at that time no longer exist and the commission should order the return of a 5-cent fare immediately.

The commission has already ruled that it would not permit the International to put its proposed increased rates on its interurban divisions and the local lines in Niagara Falls and Lockport until sworn testimony had been taken. The railway has suspended proposed increases in commutation fares until after the commission has ruled on their reasonableness.

Receivers Fight Buses

The receivers of the Steinway Railway, New York, N. Y., have started action in the Supreme Court to restrain the operation of a municipally supervised bus line on Grand Avenue, Queens. This line was authorized by the Board of Estimate on May 26 and charges a fare of 3 cents or two rides for 5 cents. The receivers charge that the bus line competes with their lines and that people who now ride the buses would be patronizing the cars.

The operation of the new bus line was started after the receivers had been sustained by the decision of Justice James C. Cropsey in their right to charge an additional 5-cent fare, at the points of connection with the lines of the New York & Queens County Railway Company, of which the Steinway lines formerly were a part.

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Railway Wins Freight Dispute

Ruling that the Philadelphia (Pa.) Rapid Transit Company's freight business was carried on under the trolley freight act, which is permissive and not mandatory, the Public Service Commission recently dismissed complaints against the action of the company in dropping its freight service. When the Philadelphia Rapid Transit Company announced in the fall its intention to suspend freight operation protests were raised on the part of the Philadelphia & West Chester Traction Company, the Lehigh Valley Transit and other companies which had been using this freight service.

When the question was brought before the commission the company postponed carrying out the suspension order until June 1, when, after giving the sixty days' notice, the freight traffic was stopped. The Philadelphia & West Chester Traction Company and the Commercial Traffic Managers' Association have asked the commission for a restoration order. Unless the dispute is carried to a higher tribunal the decision remains that the company will not have to restore its freight service.

Ticket Users Will Approach Eighty per Cent Mark

Chicago is having its first serious experience with tickets on the surface lines. The new rate of fare, 7 cents, with tickets at three for 20 cents, went into effect on June 15. In 1919 tickets were sold through stores and other agencies but the court order which fixed the 7-cent fare also provided that tickets be sold on cars. The result was additional work for the conductors and a noticeable slowing up of traffic. These conditions improved after a few days. No statement was made as to the percentage of tickets used, but President Henry A. Blair said he expected it to reach 80 per cent. The companies have a large quantity of paper tickets on hand but it is said they contemplate the use of metal tokens as soon as a sufficient supply can be delivered.

Conferences Started on Fare Issue

The new Mayor of Seattle, E. J. Brown, has attacked the problem of fare reduction on the lines of the Seattle Municipal Railway by calling a series of conferences with prominent men in the city who are interested in and informed on the municipal railway system. Included in the persons with whom the Mayor will confer is A. W. Leonard, president of the Puget Sound Power & Light Company, who represented Stone & Webster interests in Seattle when the city transacted the purchase of the street railway system in 1919. Mayor Brown states that his conference with Mr. Leonard will not necessarily involve discussion of a revision of the existing contract. In the course of his discussion with John C. Higgins, attorney for the Seattle & Rainier Valley Railway, Mayor Brown said:

> No inroads are going to be made on the general fund of the city for the street railway, with the purchase price for the street car lines at $15,000,000. If a new purchase price is agreed upon, based on a true valuation of the physical properties, it would be reasonable to submit to the voters a proposition to issue general bonds for the railway, but not till then. Under the present impossible contract, the street railway is overcapitalized. That is the whole trouble.

Mayor Brown plans to assemble all possible data before a meeting with the City Council is called to consider the 5-cent fare ordinance introduced by Councilman Fitzgerald and referred to the finance and utilities committee. He has stated that he will oppose the proposed 2-cent transfer charge provided in the ordinance, stating that the people have been promised a 5-cent fare, and that they have a right to expect it, without any strings.

Progress Seen in Traffic Check

The extensive program of the Los Angeles Traffic Commission during the past six months in endeavoring to relieve traffic congestion in the main business district of the city is bearing fruitful results from recent travel checks made in the congested districts and indicates progress in facilitating traffic movements in the downtown districts. A series of time travel checks was made by the commission under the supervision of H. Z. Osborne, Jr., chief engineer of the Los Angeles Board of Public Utilities. The checks were made by fourteen traffic men stationed at the proper intersections, while seven "checkers" in automobiles traversed the principal traffic arteries.

The work of the commission has been augmented and broadened through the co-operation of many commercial and civic organizations in the city. Extensive surveys which have been partially completed by the Traffic Commission will be reviewed, their practicability discussed from every angle and many helpful suggestions are expected to develop which will not alone solve the present problem but those also which the future holds in store. Mr. Osborne in discussing the issue said:

> Traffic congestion is the most serious problem before Los Angeles today and its solution will require the expenditure of millions. The engineers of the California State Railroad Commission in its extensive study of traffic congestion and grade crossing elimination in the city of Los Angeles found that one-third, in numbers, of the city's entire population traversed the dangerous grade crossings in the vicinity of the Los Angeles River daily.
>
> The Los Angeles Railway transports more than 500,000 passengers daily, exclusive of transfer passengers. Every one of these car riders loses from one to fifteen minutes daily because of traffic congestion.
>
> The amount of traffic flowing through city arteries can be increased either by speeding up the rate of flow or increasing the effective street areas. The rate of flow can be increased by some of the following expedients:
>
> Prevent tieups and the crossing of traffic by eliminating left-hand turns. Eliminate the parking of automobiles in the first "dead-line" of traffic during certain hours. Require vehicles for hire to operate from private property. Reroute through traffic so that it does not enter the congested district. Provide "isles of safety" to facilitate the flow of vehicular traffic and the loading and unloading of street cars. Reroute street cars and provide streets and viaducts for automobile traffic only.

Commission Upholds Railway's Fare Schedule

The Public Utilities Commission of Utah recently rendered a decision whereby the Utah Light & Traction Company, Salt Lake City, Utah, will not decrease at the present time its schedule of fares. This decision concludes a case brought by Charles Anderson, Mayor of Murray, Utah, a suburb lying about 7 miles south of Salt Lake City, and others, by petition.

The applicants had set forth that by reason of the decrease in wages and other costs the street car fares should be subjected to reduction. The company replied that, while wages had been reduced, it had been compelled, by reason of deferred repairs during the high price period, to engage a larger force when the prices had come down, and therefore had paid out more money in 1921 than in 1920. The company further stated that no very considerable purchases had been effected of the products on which reduced prices were quoted by Mr. Anderson, but that as a rule prices on finished products had not been materially reduced. The wage scale of employees was still much in excess of that which prevailed before the increases in fares had been granted by the commission.

The commission, in its report, says in part:

> The commission appreciates the attitude of the public mind in the matter of a reduction of rates of street car service. Many have the idea that wages alone control the change in the rates heretofore allowed by the commission. That was not the case. The importance of car fare to the people who are forced to pay the same was and is not overlooked by the commission, and the amount authorized to collect was reached after a most careful investigation and consideration of all the conditions and circumstances attending the giving of such services.

New Orleans' Nocturnal Nomads

A. Morris Buck, New York, representing J. A. Beeler of the Beeler organization, who is conducting a traffic survey at New Orleans, has made an unexpected discovery. If the capacity loads carried by the cars of the New Orleans Railway & Light Company after 9 p.m. and until midnight and thereafter are criterions by which the experts are to be guided, the people of New Orleans are human bats, as the street traffic there is different in this respect from any other city in the United States which Mr. Buck has studied.

Another peculiarity of street car travel in New Orleans is that of Monday travel. There appears to be no difference in volume between Saturday and Monday. One day is as heavy as the other. This is due largely to the fact that the big Canal Street department stores have their bargain sales on Monday. In consequence Mr. Buck has been forced to change his original working plans of the survey, so as to make a special study of the Monday traffic.

Most, but not all, of the big stores in the city of New Orleans are on Canal Street.

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Personal Mention

Expansion Makes Staff Changes Necessary

The expansion of the activities of the McGraw-Hill Company has made necessary some changes in the editorial staffs of some of the papers, among them ELECTRIC RAILWAY JOURNAL.

Harold V. Bozell, at present coeditor of ELECTRIC RAILWAY JOURNAL, has been appointed an editor of *Electrical World* in executive charge of the paper. He will, however, continue an active interest in the electric railway field and in the JOURNAL, having been appointed consulting editor of ELECTRIC RAILWAY JOURNAL. H. W. Blake continues as editor of ELECTRIC RAILWAY JOURNAL.

Harry L. Brown, who has been associate editor and Western editor, with offices in Chicago since 1916, has been transferred to New York to become managing editor. Henry H. Norris, who has been managing editor and who has also been directly in charge of the engineering features of the paper, will become engineering editor. This will enable him to devote his entire time to the technical side of the field, including a more intensive treatment of heavy electric traction, thus fulfilling what has been his main wish with respect to his contributions to the publication of the paper.

In Chicago the ELECTRIC RAILWAY JOURNAL office will be in charge of Donald F. Hine, associate Western editor.

These changes are effective July 1.

A. J. Anderson Promoted

Aldon J. Anderson has been appointed general freight and passenger agent for the Salt Lake & Utah Railroad, with headquarters in Salt Lake City. His promotion was from the position of auditor of the road. C. M. Osborne has been made acting auditor.

Mr. Anderson has been with the Salt Lake & Utah, better known as the Orem Electric Railroad, for six years, coming to that road from the Oregon Short Line, with which he had been for ten years.

Mr. Osborne has been chief clerk to the auditor for two years, and prior to taking that position was in the accounting department of the Oregon Short Line.

The promotions were effective June 1.

L. A. Goodrich Traffic Manager

L. A. Goodrich, who has been with the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., for seventeen years, has been named traffic manager. The announcement was made on June 9, the appointment to be effective at once. Mr. Goodrich started with the company as bill clerk. He was later advanced to the position of freight agent and from there to the post of traffic manager.

His early experience, as Mr. Goodrich tersely puts it, was with the Grand Trunk Railway, in various positions connected with station work. For two years he was telegraph operator at Fuller, the junction of the Grand Trunk, the Pennsylvania and the Père Marquette Railways.

L. E. Moreland's Work Recognized

L. E. Moreland, who has been serving as secretary of the Canadian Electric Railway Association for the past year, was given a special vote of thanks for his strenuous year's work at the annual convention held in Quebec, June 1 to 3. Mr. Moreland will continue to serve until either a permanent secretary is elected or a new secretary is appointed under the present procedure of selecting a man conveniently located with respect to the president's headquarters.

L. E. MORELAND

Mr. Moreland is a young man who has worked his way up in a period of seven years from timekeeper to chief clerk for the Hull (Que.) Electric Company. He was educated in the Ottawa (Ont.) public schools and has stuck to his native locality during his career. Mr. Moreland is twenty-seven years of age.

Mr. Shapiro's Duties Extended

Alexander Shapiro, statistician and assistant in the executive department of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been appointed executive assistant of the Wisconsin Motor Bus Line. This is the name under which the traction company operates its bus service. Mr. Shapiro will continue certain parts of his previous work in addition to his new duties. Mr. Shapiro served with the American Electric Railway Association as assistant in the Bureau of Fare Research, and later as chief of the Bureau of Statistics and Information. He has also made several investigations for the Association's Committee of One Hundred.

Mr. Shapiro has been with the Milwaukee company since 1920, and has been actively working in the executive department and on the transportation committee.

Dr. Herman Humphrey, Louisville, Ky., has been appointed chief surgeon of the Louisville Railway. Dr. L. Ray Ellers has been made associate surgeon.

R. H. Hubbard, general engineer of the Athens Railway & Electric Company, Athens, Ga., has been transferred to Boulder, Col., as general superintendent. H. K. Baker will succeed Mr. Hubbard as general engineer of the Athens property. Mr. Hubbard will be connected with the Western Light & Power Company.

E. O. Shryock, superintendent of railways for the Northwestern Ohio Railway & Power Company, Oak Harbor, Ohio, has resigned to become superintendent of the Columbus, Newark & Zanesville branch of the Ohio Electric Railway. Mr. Shryock has been with the Northwestern Ohio company since 1913, having served with the Meadville & Cambridge Springs Street Railway and the People's Incandescent Light Company.

Phil Harding, traffic manager of the Utah-Idaho Central Railroad, Ogden, Utah, for the past fourteen months, has tendered his resignation. F. L. Whitney of Salt Lake City has been named to succeed Mr. Harding. Mr. Whitney was associated with the Oregon Short Line and the Southern Pacific lines in the traffic department for fifteen years. He has been connected with the United States Fuel Company in the traffic department at Salt Lake for the past six years.

W. D. Pearce, formerly of Forsythe, Mont., has been appointed manager of the Walla Walla Valley Railway, Walla Walla, Wash. The company, which was recently purchased by the Northern Pacific interests, operates the city and interurban lines. Charles S. Walters, who was formerly manager of both the railway company and the Pacific Power & Light Company, remains as manager of the power company and will also be connected with the railway company. W. D. Pearce was formerly trainmaster at Forsythe and has been connected with the Northern Pacific for sixteen years.

Earle W. Hodges, formerly Secretary of State of Arkansas, will be the director of the Arkansas Public Utilities Information Bureau, with headquarters in the Exchange National Bank Building, Little Rock. For the past four years Mr. Hodges has been associated with the Near East Relief organization. His work with the Public Utilities Information Bureau will consist of transmitting news of the utilities to the using public and so bringing about an understanding between producer and

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the consumer of the service. This bureau, it is stated, will have no connection with the Arkansas Utilities Association.

Obituary

Samuel E. Pingree, former Governor of Vermont, died on June 1. He was chairman of the State Railway Commission from 1886 to 1894.

Harry V. Catlin, cashier of the Detroit (Mich.) United Railway, died suddenly in his office on May 12. Mr. Catlin had been in ill health for some time.

Ira B. Lesh, general superintendent of the Railways Material Supply Company, and president of the Ferguson Furnace Company, died May 24, at his home in Toledo, Ohio. Mr. Lesh went to Toledo three years ago from Philadelphia.

Daniel Coolidge, former president of the Lorain Steel Company, Johnstown, Pa., died recently at his home in Johnstown. He headed the Lorain company from 1899 to 1919, having previously been vice-president and in charge of sales. Until its merger with the Lorain Steel company Mr. Coolidge was connected with the Johnson company. He studied engineering in the East and West after leaving preparatory school, and later became superintendent of the Boston Elevated Railway.

Emerson McMillin, chairman of the board of directors of the American Light & Traction Company, New York, N. Y., died on May 31, after an illness of two days. Mr. McMillin's chief interest was in the consolidation of competing public utility companies, especially gas companies. He became president of the American Light & Traction Company, which controls the Muskegon Traction & Light Company and the San Antonio Public Service Company, in addition to several gas companies. For more than ten years after the Civil War Mr. McMillin was interested in the manufacture of iron and steel and was president of several companies in the Ohio valley.

Joseph Maycock, for more than twenty years railway representative for Pratt & Lambert, Inc., died in Buffalo, N. Y., on June 15. He was one of the best-posted men on the finishing of railway equipment in the country and originated several finishing systems for various railroads. He entered the Buffalo shops of the Erie Railroad after leaving school, and was later master painter. Twenty-two years ago he began selling Pratt & Lambert railway finishes, with headquarters in New York. He gave up his active work with the company several years ago, but retained his connection with Pratt & Lambert until his death. He was a member of several railway associations. Mr. Maycock was born in Oxford, England, in 1843. He came to this country when he was twelve years old.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Reconstruction of Detroit Lines Going Forward

The reconstruction and repair work necessary on former Detroit United Railway lines is being carried on by the Department of Street Railways. About 7,000 ft. of new track is to be laid on Woodward Avenue. This track will extend from Willis Avenue to Baltimore Avenue and will replace some of the poorest sections now on the Woodward Avenue line. The pavement between tracks will be replaced at the same time and other sections of track and pavement on Woodward Avenue will be repaired while the main reconstruction is in progress.

The Woodward Avenue tracks from Willis to Baltimore Avenue were constructed originally without any foundation, and after a thorough inspection it was decided to make as complete a job as possible. As the other sections can be repaired to last four or five years, they will not be reconstructed this year. Rebuilding of other sections will follow until the entire length of line is of new construction.

Emergency repair work is being done in various parts of the city to remove danger spots due to holes in the pavement and split rails. New trolley wires are being strung over many sections, including the entire Woodward Avenue stretch from the Detroit River to the Boulevard. The overhead lines were found to be in very poor condition as they had been allowed to deteriorate until it was considered that a general breakdown was not far off unless extensive repairs were carried out.

The new track which the city is laying is identical to that laid in other sections of the municipal system, being monolithic concrete type of construction with twin steel ties. New steel and other necessary materials have been delivered along the line and men and machines are working day and night. Temporary tracks have been laid on either side of the street next to the curbs to carry the cars around the section where the new track is under construction. A large number of men have been put to work and all the repairs will be carried out by day labor under the direction of the maintenance department. None of the reconstruction work will be done under contract according to present plans. The rebuilding of the 7,000 ft. of track on Woodward Avenue will necessitate the added expenditure of about $128,000.

Further Details of Boston's New Cars

As announced in these columns for April 29, the Boston (Mass.) Elevated Railway has ordered 100 new surface cars which may be operated either by one or two men as occasion requires. They will cost approximately $10,500 each and will make possible the retirement of box cars and articulated cars. The new cars will represent the best development of present day ideas in surface car construction.

	No. 4 Semi	New Car	Birney Safety Car
Approximate cost	$8,000	$10,500	$6,771
Ton weight—empty	26½	15	8½
Seating capacity	52	48	32
Motors	4-W.H. 306 50 hp. each	4-G.E. 264 25 hp. each	2-G.E. 264 25 hp. each
Control	W-H.L.	K-35	Standard safety car
Width of aisle	28 in.	28¼ in.	22 in.
Width of door	4 ft. 6½ in.	4 ft. 7½ in.	2 ft. 9 in.
Height of car	12 ft.	10 ft. 7 in.	9 ft. 10¼ in.
Over-all length	48 ft. 2¾ in.	45 ft.	28 ft. ¼ in.

The above comparison between the new cars, the No. 4 semi-convertible cars and Birney safety cars gives a clear idea of their characteristics.

Authorizes Expenditure of $84,000

The Board of Public Works has approved an ordinance authorizing the expenditure of $84,000 for reconstruction work on the lines of the Seattle (Wash.) Municipal Railway, as follows: Reconstruction of track on First Avenue South, from Atlantic Street to Stacey Street, costing $12,000; reconstruction of tracks on First Avenue, Pine to Cedar, $31,000; on Second Avenue, Virginia to Cedar, $15,600; adjustment of tracks on Madison Street, First Avenue to Western Avenue, approximately $3,500; reconstruction and overhauling of approximately thirty passenger cars, $17,000.

Metal, Coal and Material Prices

Metals—New York	June 20, 1922
Copper, electrolytic, cents per lb.	13.75
Copper wire base, cents per lb.	14.75
Lead, cents per lb.	5.75
Zinc, cents per lb.	5.70
Tin, Straits, cents per lb.	31.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$6.125
Somerset mine run, Boston, net tons	3.20
Pittsburgh, mine run, Pittsburgh, net tons	...
Franklin, Ill., screenings, Chicago, net tons	...
Central, Ill., screenings, Chicago, net tons	...
Kansas screenings, Kansas City, net tons	2.925
Materials	
Rubber-covered wire, N. Y., cents per lb	5.75
Weatherproof wire base, N. Y., cents per lb.	15.50
Cement, Chicago net prices, without bags	$2.07
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	85.00
White lead, (100-lb. keg), N. Y., cents per lb.	12.25
Turpentine (bbl. lots), N.Y., per gal.	$1.08

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Dayton Companies Go to One-Man Operation

Four of the six street railway companies operating in Dayton, Ohio, are planning to go largely to one-man operation. The Dayton Street Railway purchased and is now operating fifteen new standard safety cars and is also operating some of its old double-truck cars with one man. The latter may be remodeled later, but no change has been made in the construction or equipment to date. The City Railway is purchasing from the Cincinnati Car Company fifteen light-weight, double-truck cars weighing 26,500 lb. complete with quadruple equipment of G. E. 264 motors and Westinghouse air brakes and arranged for single-end, one-man operation. These cars will be fitted with the Syracuse type turnstile on the rear end, and owing to the transfer situation it will be necessary for passengers to pay as they enter. They will therefore enter at the front door and leave through the turnstile by the rear door. To control this operation properly there will be an outside mirror on the front corner post and one inside mirror on the right-hand side of the car so that the operator can see passengers alighting both from the inside and outside of the car. The seating capacity of these cars will be fifty-two. They are constructed with the curve lift sides similar to the interurban cars now operated by the Kentucky Traction & Terminal Company, Lexington, Ky.

The City Railway is also remodeling all of its present double-truck cars for one-man turnstile operation. These cars have drop platforms which, in the rear, will be built up to the floor level and additional seats provided, leaving room for a step up to the turnstile. These cars now seat forty-eight and with the turnstile and additional seats in place will seat fifty-two. The use of Shanklin transfer machines is also being considered to facilitate the one-man operation.

The Oakwood Street Railway is also changing its cars over for similar operation. The Dayton, Springfield & Xenia Southern Railway is remodeling its double-truck cars for one-man operation and employing the standard safety devices. At the present time one car is being operated with a turnstile and "pay-as-you-leave," but it will be necessary to change over to "p-a-y-e" later on account of the transfer situation. The People's Railway and the Cincinnati & Dayton Traction Company are not contemplating one-man operation at this time.

Rolling Stock

Community Traction Company, Toledo, Ohio, will reconstruct cars in the near future for one-man car operation.

Louisville (Ky.) Railway has under construction fifteen one-man cars which it is reported will be put on the Brook and Seventh Street line on Aug. 1.

Interstate Public Service Company, Indianapolis, Ind., has planned to put in operation the five new one-man cars between New Albany and Jeffersonville. The cars were constructed in Cincinnati. Reference was made to this new equipment in the ELECTRIC RAILWAY JOURNAL issue of May 13.

Track and Roadway

Community Traction Company, Toledo, Ohio, has ordered materials to start upon the track improvement program which will require an expenditure of $500,000.

Public Service Railway, Camden, N. J., has obtained permission to shift the Kearns turnout about half a mile to the west so as to even up the running time between Camden and Riverside. Work on this improvement will be started in a short time.

Chattanooga (Tenn.) Traction Company will extend the tracks of the Red Bank line several miles up the Dry Valley district in the near future. The company has the poles for the wires, a large amount of rails and other equipment necessary to the line.

Washington Water Power Company, Spokane, Wash., recently began laying tracks on the nine blocks of double tracking on East Sprague Avenue, which is being installed for the Spokane United Railways as the result of the elimination of the Union Park loop after consolidation takes effect.

Savannah Electric & Power Company, Savannah, Ga., is progressing rapidly on the replacing of the present 50-lb. low T rail on Forty-sixth Street with 7-in., 70-lb. high T rail. This work also includes the construction of a 300-ft. siding. This construction work is being done to serve patrons on the Habersham Street line. The company has also installed a switch at Bay and Whitaker Streets in the eastbound track.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa., is drawing up plans for a trolley switch and loop at Market and Radcliffe Streets, Bristol, to carry passengers from Philadelphia to the steamers running to Island Beach, between Burlington and Bristol. The plans will be submitted to the Bristol Borough Council at a meeting to be held in July. Minot J. Hill, general manager of the traction company, plans to run an express service from Philadelphia to the island.

Seattle (Wash.) Municipal Railway has completed the newly-constructed First Avenue South-East Marginal Way street car line in the southern end of the city. This event was recently celebrated by the South End Industrial Association. The new route extends over First Avenue south from Spokane Street to East Marginal Way and over East Marginal Way to a junction with the old South Park car line, furnishing a shortened route to the business center of the city, and efficient car service to the industrial workers in the tideflats district along the Duwamish Waterway.

Capital Traction Company, Washington, D. C., has made formal application to the War Department to construct a double-track extension on the new Georgetown bridge and to operate cars between Georgetown and Rosslyn. According to engineers the extension will cost about $150,000. If the War Department approves, residents of nearby Virginia points, now dependent for street car service on the Aqueduct bridge line of the Washington & Old Dominion Company, will not be left without street railway transportation next spring when that company abandons its cross-river service.

Trade Notes

Mason B. Starring, president of the California Railway & Power Company and of the United Railways Investment Company, was elected a director of Burns Brothers Coal Company at the last meeting in May.

Track Specialties Company, New York, N. Y., has announced the appointment of J. S. O'Connor of the Standard Supply Company located at 315 Beatty Building, Houston, Tex., as its Texas agent.

American Abrasive Metals Company, New York, N. Y., manufacturer of feralun, alumalun, vulcalun and bronzalun anti-slip treads, announces that it has also been appointed a representative by the Carborundum Company of Niagara Falls for the Carborundum anti-slip tile.

Dryden Rubber Company, Chicago, Ill., announces that E. H. Young and H. E. Lavalle have been appointed exclusive Eastern representatives, with headquarters at 18 Vesey Street, New York, for the sale of Dryden double-wear friction tape and splicing compound in the New England and Middle Atlantic States.

New Advertising Literature

Wagner Electric Manufacturing Company, St. Louis, Mo., recently issued a folder emphasizing Wagner quality "year after year." The folder contains three calendars for the year 1922 with the months of May, June and July on top.

Rail Welding & Bonding Company, Cleveland, Ohio, has published a new catalog on its type WW dynamotor and its uses, particularly as employed for carbon arc rail joint welding. A special section is devoted to a description of the carbon arc process.

Northern Equipment Company, Erie, Pa., has just published a booklet entitled "Regulating Boiler Feed Water." The subject has been treated through the use of charts showing the effect of feed-water regulation on water input, steam output, feed water temperature, etc.

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Vol. 59, No. 25 New York, June 24, 1922 *Pages 989-1020*

ELECTRIC RAILWAY JOURNAL

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor

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Control Equipments for Pacific Electric Railway 991
BY W. M. HUTCHISON.
Twenty motor cars and ten trailers arranged for operation on both 600 and 1,200 volts d.c. have recently been added. Many new features are included.

Trend of Prices, Wages and Fares 995
Chart shows variations during last ten years in wholesale prices and general construction costs and in electric railway material costs, wages and fares. The chart is based on figures assembled and compiled by Albert S. Richey.

How Resistance Is Used in Railway Automatic Substations 997
Views of several electrical engineers of long experience with automatic substations are presented on the question of using resistance in the machine circuit, or in the feeder circuits, or both.

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Many new devices and important developments in specialties and railroad equipment which have been brought out since 1920 shown at Atlantic City convention of American Railway Association, mechanical division. Machine tool exhibits of particular interest.

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Financial and Corporate 1013

Traffic and Transportation 1016

Personal Mention 1018

Manufactures and the Markets 1019

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Electrical Review and Industrial Engineer
(Published in Chicago)
American Machinist—European Edition
(Published in London)

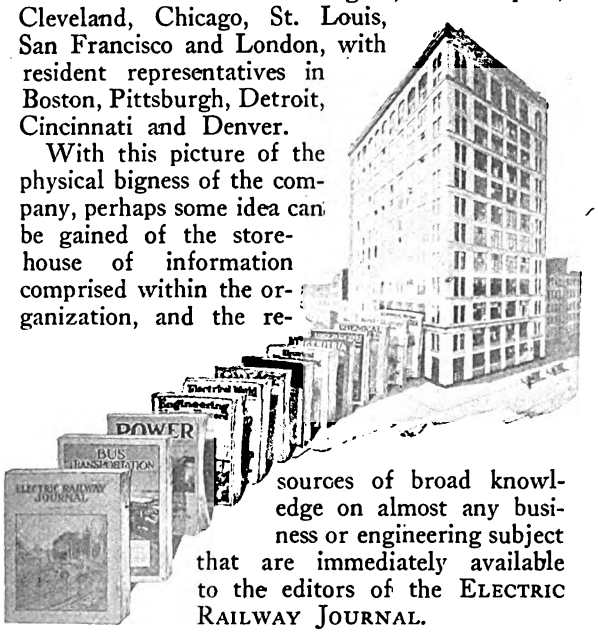
The annual subscription rate is $4 in the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Porto Rico, Canal Zone, Cuba, Honduras, Nicaragua, Dominican Republic, Salvador, Peru, Colombia, Bolivia and Shanghai, China. Extra foreign postage in other countries $3 (total $7, or 29 shillings). Subscriptions may be sent to the New York office or to the London office. Single copies, postage prepaid, to any part of the world, 20 cents.

Change of Address—When change of address is ordered the new and the old address must be given, notice to be received at least ten days before the change takes place.
Copyright, 1922, by McGraw-Hill Company, Inc.
Published weekly. Entered as second-class matter, June 23, 1908, at the Post Office, at New York, under the Act of March 3, 1879. Printed in U. S. A.

The Backing of Electric Railway Journal

ELECTRIC RAILWAY JOURNAL is produced by the largest industrial publishing house in the world. It was the first property of what now constitutes the McGraw-Hill Company, Inc., with its fourteen internationally known business papers, each the leader in its field. This wonderful growth represents a measure of the high ideals of service and responsibility of James H. McGraw, who has long been one of the outstanding figures of the publishing industry. The character and enterprise of this first property formed the foundation on which was built the present great institution.

Now, the fourteen papers serve more than 180,000 subscribers. Their publication requires the employment of 1,200 skilled workers and highly trained executives. From 5,000 to 6,000 tons of print paper annually are consumed. In the company's composing room in New York men and machines set 6,000 text and advertising pages monthly. In the press room modern cylinder presses turn out 8,000,000 copies of eleven publications yearly, three being published elsewhere. In the bindery almost human machinery binds annually the billion and a quarter pages that make up these journals. In addition to the home office, housed in the company's own fourteen-story building in New York, branch offices are maintained in Washington, Philadelphia, Cleveland, Chicago, St. Louis, San Francisco and London, with resident representatives in Boston, Pittsburgh, Detroit, Cincinnati and Denver.



With this picture of the physical bigness of the company, perhaps some idea can be gained of the storehouse of information comprised within the organization, and the resources of broad knowledge on almost any business or engineering subject that are immediately available to the editors of the ELECTRIC RAILWAY JOURNAL.

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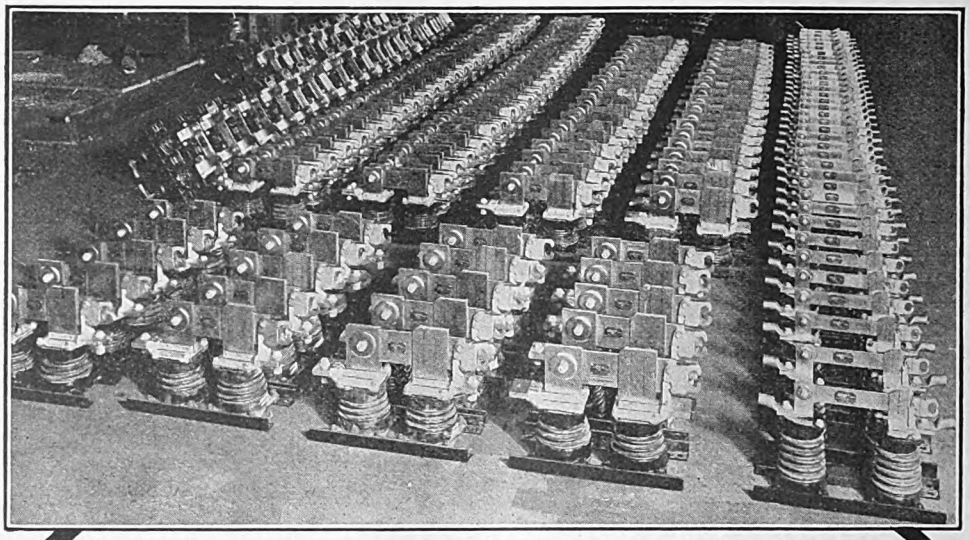
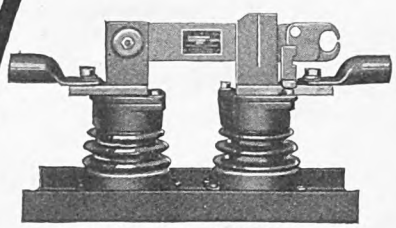
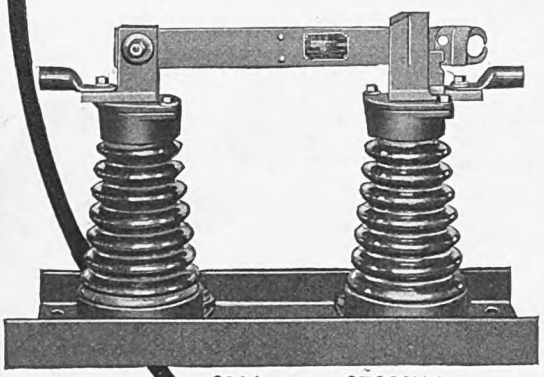


Westinghouse Disconnecting Switches ready for shipment

Discriminating Engineers Specify Westinghouse Type S Disconnecting Switches



200 Amperes, 7500 Volts



200 Amperes, 25,000 Volts

because they stand up under the enormous mechanical strains incident to severe short circuits.

One of the most complete and exhaustive series of tests ever run on disconnecting switches emphasizes these important characteristics of the type S switch.

A lock that is absolutely dependable.

The lock cannot fail thermally because it carries no current.

The lock is not supported by, and is separate mechanically from, the break jaw so that possible spreading of the jaw blades cannot unlatch it.

Mechanical stresses, which act to spread the insulators apart and to blow the switch blade open, only tighten the grip of the type S latch.

The hinge jaw blades are solid (not split) preventing the hinge bolt from pulling out with the resultant opening of the circuit at the hinge jaw.

The hinge and break jaws are permanently sweated and pinned to jaw blocks.

The large head and broad base of the insulators furnish sturdy mechanical support.

Ample cross section of copper parts, and rugged construction of all fittings, assure the full utilization of all the other superior points of construction.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

W WESTINGHOUSE ELECTRIC

Westinghouse

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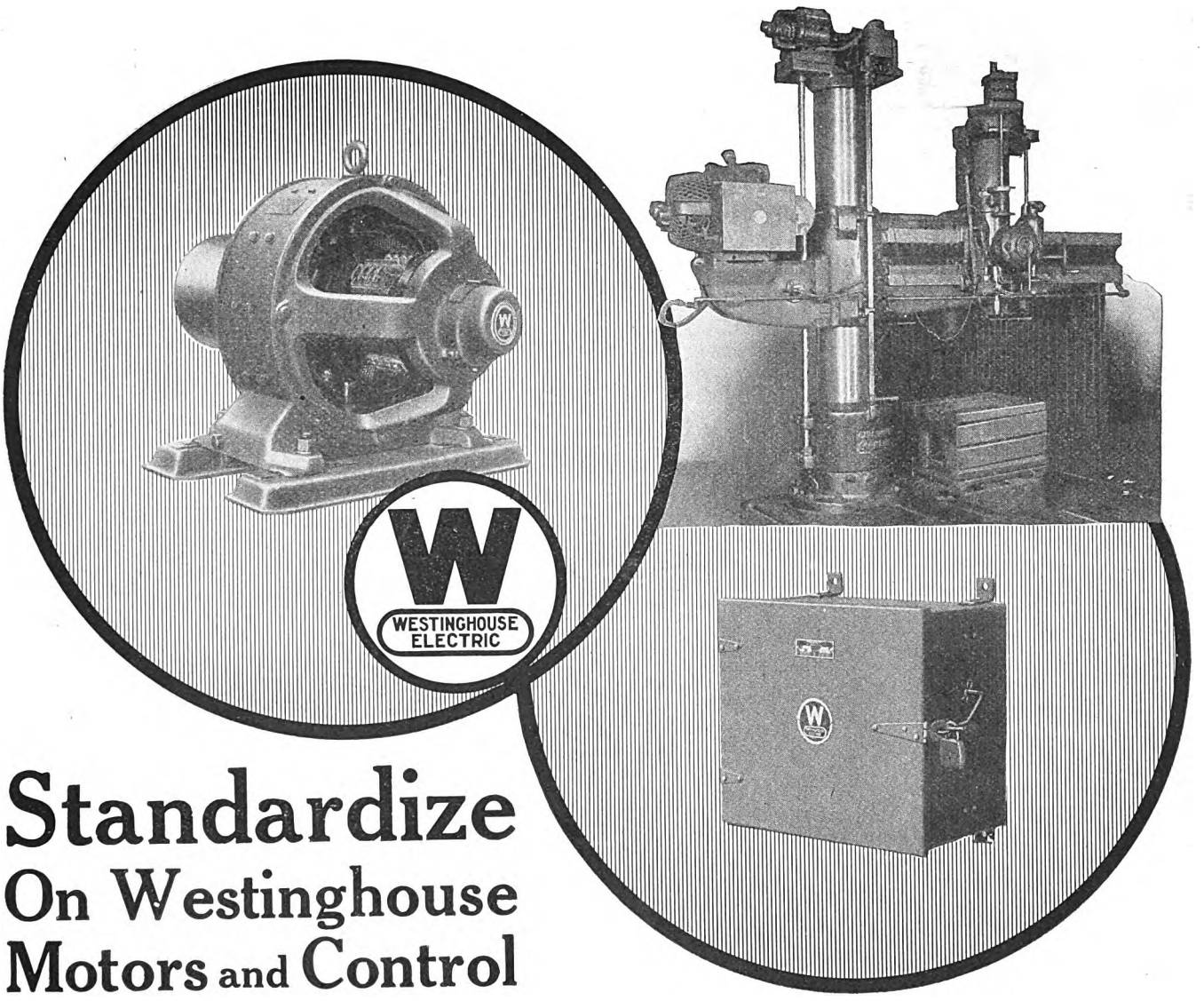

Standardize On Westinghouse Motors and Control

Two essential characteristics determine the selection of a motor that will satisfactorily meet the varied demands of railroad shop drive—*simple mechanical construction* that combines strength and durability with comparatively few parts and with wide interchangeability of parts—exceptional *electrical design* assuring long life and high efficiencies under wide, variable loads.

Check the Westinghouse type SK motor on these points:

MECHANICAL—Only 37 frame sizes and 19 bearing sizes for a complete line of constant and adjustable speed motors, from 1½ to 250 hp. Front and rear bearings are interchangeable.

The frames are made of forged, open hearth steel, which provides great strength with lightness and compact dimensions. The bearings have large area and the shafts are made of axle steel. These are some of the reasons why the type SK motor has been very successful in operating heavy duty planers, wheel lathes, bending rolls and other machine tools.

ELECTRICAL—*Sparkless commutation* assures longer brush and commutator life, gives maximum motor efficiency and practically prevents trouble from burn-outs causing "shutdowns." *Open construction* provides *natural ventilation* that makes cool operation possible under all loads.

SERVICE—Since 1911 the type SK motor has been the Westinghouse standard for d-c. drive. Hence its admirable performance on every type of railroad shop installation. Make your shop produce more, and lower your maintenance bills by standardizing on the type SK motor.

Westinghouse Electric & Manufacturing Co.

EAST PITTSBURGH, PA.

Offices in all large American Cities

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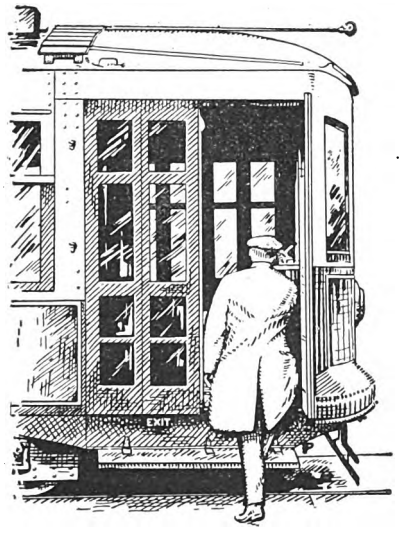
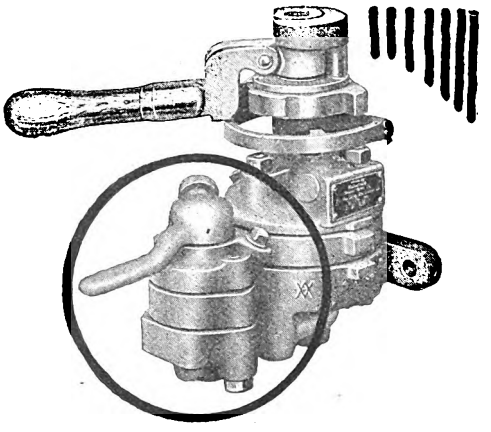
Render your Patrons "Selector Valve Service"





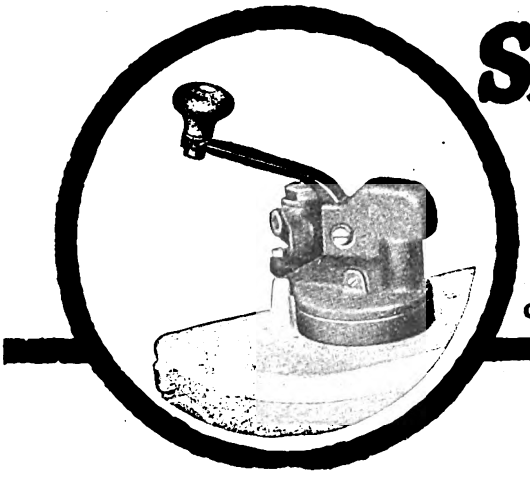
THE new Selector Valve facilitates the operation of double-passage Safety Cars by providing better and safer door control.

Either door—entrance or exit—may be operated independently, or both together, as the situation requires.

The tendency in some cases toward modified Safety Cars, with enlarged loading platforms and double-passage doors, has made the Selector Valve a modern necessity.

Saves time and risk in loading and unloading; increases car miles; gives the operator better supervision over an important part of his job.

We make the Air Brake and Safety Car Control Equipment which makes the Safety Car!



SAFETY CAR DEVICES CO.
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Postal and Telegraphic Address:
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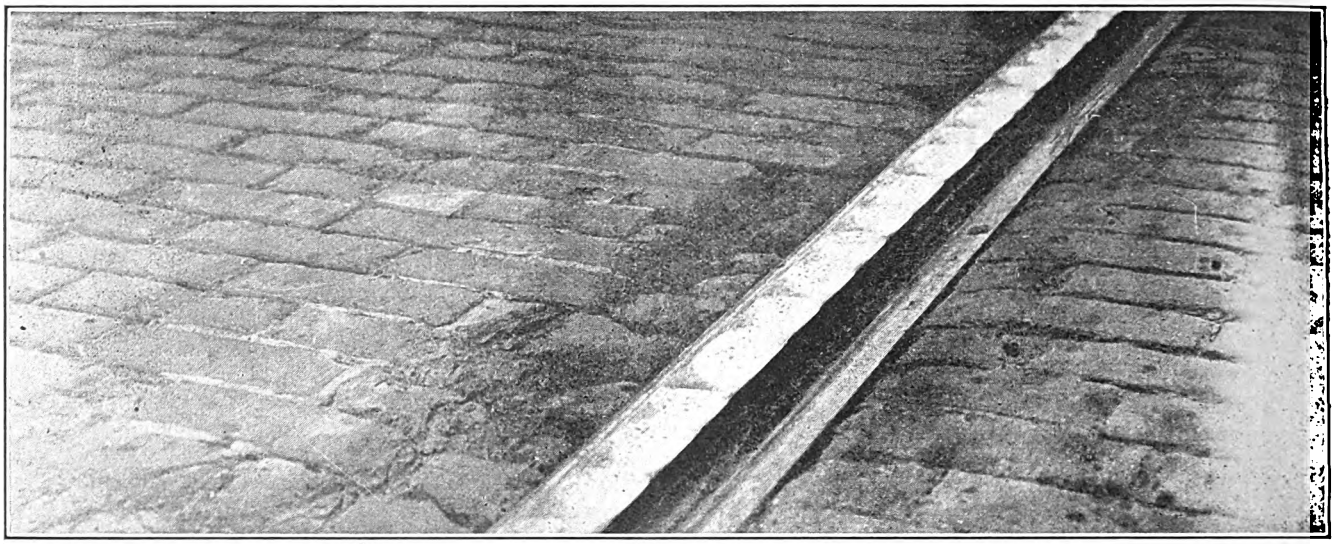
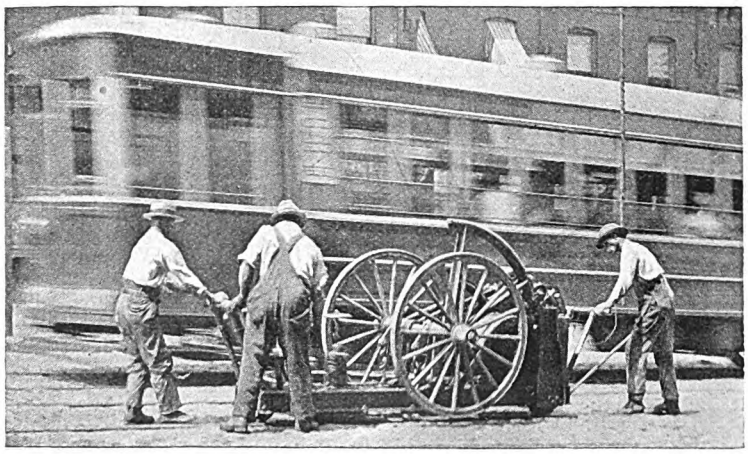


Restore this Rail-Head to Orginal Contour

RECIPROCATING GRINDER
ELIMINATES CORRUGATIONS



Uses a long, straight grinding block which shapes itself to fit the rail. Working back and forth, with a stroke of 5½ inches it smooths out every trace of corrugation. The whole machine is light but strong: It can be easily de-railed and removed to permit cars to pass. An essential part of track equipment for every road.

Ajax Electric Arc Welders

Atlas Rail Grinders Universal Rotary Track Grinders

RAILWAY TRACK-WORK CO., 3132-38 E. Thompson St., PHILADELPHIA, PA.

AGENTS:

Chas. N. Wood Co., Boston. Electrical Engineering & Mfg. Co., Pittsburgh Atlas Railway Supply Co., Chicago P. W. Wood, New Orleans

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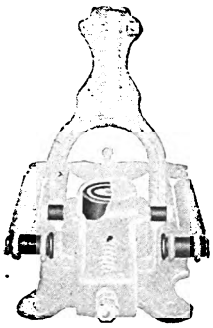
Here are some of the reasons why

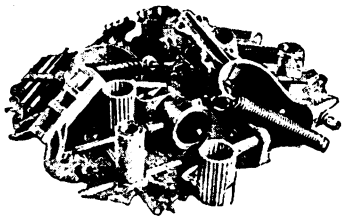
O-B TROLLEY BASE

should be on your cars.



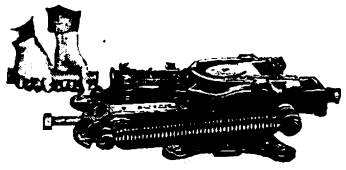
New Base for a few cents

All points of principal wear have renewable bushings—shown dark on the photograph. A few cents and a few minutes puts an O-B Base which has seen strenuous service back in perfect condition.



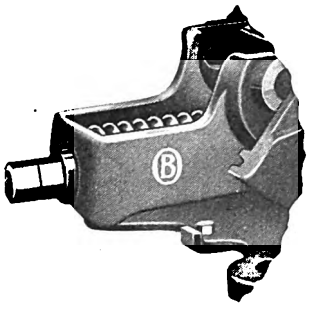
Interchangeable Parts

You can take five or five hundred O-B Bases, tear them down, mix the parts and put them all together again without a hitch. Repair parts fit—chipping, filing or grinding are never necessary.



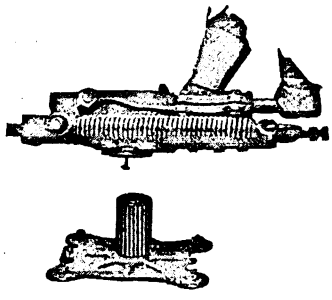
Changing Poles

There is a hook on the O-B Base which locks it, if desired, with the pole in a horizontal position. Poles can be changed in the barn even if headroom is limited.



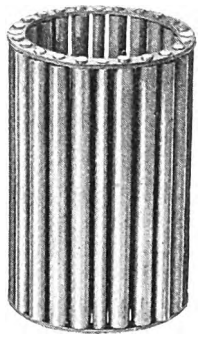
Buffer Spring Absorbs Shocks

If the pole leaves the wire and jumps wild, this sturdy buffer spring on the O-B Base absorbs the shock. It reduces strain on the pole, the base and the car roof.



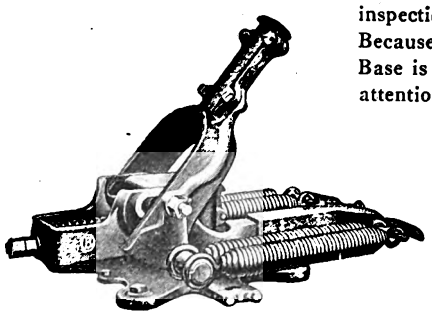
Accessible

One man can lift the O-B Base off its stem casting and expose every vital part for inspection and lubrication. Because it is that easy, O-B Base is sure to get whatever attention it needs.



Twenty Caged Roller Bearings

With the wear divided between twenty rollers, the O-B Base pivots freely—holds wheel to trolley even when track or wire is crooked. Notice that the rollers stand by themselves.



O-B Form 1 Base (Patented)

The Ohio Brass Co.

Mansfield, Ohio, U.S.A.

New York Philadelphia Pittsburgh Charleston, W.Va. Chicago Los Angeles San Francisco Paris, France

Products: Trolley Material, Rail Bonds, Electric Railway Car Equipment, High Tension Porcelain Insulators, Third Rail Insulators

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Insurance plus Marsh & McLennan Service

Additions and Betterments

When plans are taking shape for additions and betterments, you can profitably employ the services of Marsh and McLennan engineers.

They enable you to safeguard profits, eliminate hazards and reduce insurance cost.

Business executives of many of our large corporations have used this service profitably.

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Winnipeg
Montreal
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It Looked Like A $17,000 Job—
But Steel Twin Ties Reduced It to $10,000

On a New York interurban property there was a 2300 foot stretch of worn out patch track laid with a nine inch girder rail, wood ties under which was 6 to 8 inches of concrete.

When the first cost estimate on rebuilding this track was prepared based on removing the old concrete completely the result was about as shown in the table on the left.

Then another estimate was made based on Steel Twin Ties, an 80 lb. tee rail and leaving the old concrete in place. This is easily accomplished with this tie which requires only 3 inches of clearance. (Estimate on the right).

COSTS PER FOOT WOOD TIES	
Remove old track	$1.67
New rail	1.06
Wood ties	.30
Concrete	2.67
Labor	.30
Joints	.08
Paving	1.77
Total	$7.85

If you have a similar job even if you do not have nine inches of clearance Steel Twin Ties will save you dollars too.

Write today giving a short outline of conditions on your proposed work and we will gladly prepare a suggestion for your job.

The International Steel Tie Company
CLEVELAND

COSTS PER FOOT STEEL TWIN TIES	
Excavation to base old rail	$ .67
Steel Ties	1.00
Labor	.20
Concrete Paving	1.77
Rail	1.06
Joints	.08
Total	$4.78

Steel Twin Tie Track

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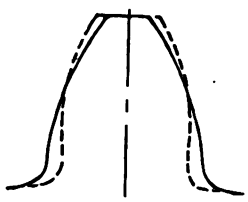
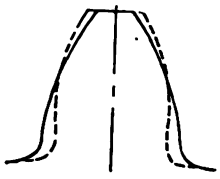
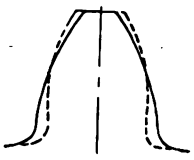


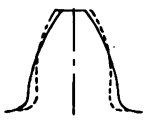
Interurban Railway Style
24 teeth, 2½ pitch, WISDOM-TOOTH contrasted with
25 teeth, 2½ pitch, standard tooth.



Elevated Railway As Used By Interborough Rapid Transit Co.
15 teeth, 2.5948 pitch, WISDOM-TOOTH contrasted with
16 teeth, 2.5948 pitch, standard tooth.



City Railway or Mine Locomotive
15 teeth, 3 pitch, WISDOM-TOOTH contrasted with
16 teeth, 3 pitch, standard tooth.



"Safety Car" Type
12 teeth, 4¼ pitch, WISDOM-TOOTH contrasted with
13 teeth, 4¼ pitch, standard tooth.

Built Stronger—Last Longer

"Tool Steel" Wisdom-Tooth Pinions

will run with your present gears

While the old B & S standard 14½° tooth may do where gears are not overstressed or subjected to abnormal wear, it is not the strongest tooth available for the abnormal wearing conditions of street railway service. But the thousands of high-grade gears in service with standard B & S teeth cannot be scrapped in order to secure immediate use of more modern tooth shapes, either in 20° angle, in helical or in other types.

"Tool Steel" WISDOM-TOOTH pinions solve this problem by giving a modern shaped pinion tooth and yet one that will run interchangeably with the old gear, quietly, with a normal efficiency in the transmission of energy. The tooth is decidedly stronger than the old standard when new and as it wears, tends to maintain its strength rather than to wear with undercut flanks.

"Tooth Steel" WISDOM-TOOTH pinions have been given careful tests in many types of service, in the railway and mining industry, have been pronounced a decided success in each case and have now been adopted as standard by many large users.

The slight change in gear ratio, due to one less tooth than standard in "Tool Steel" Wisdom-Tooth Pinions, will have no appreciable affect on car speeds. It has not affected operating conditions in the slightest in places where it has been actually tried.

Secure them for trial installation.

"Tool Steel" Quality T. S. Q. "Tool Steel" Quality

Tool Steel Gear and Pinion Co.
Cincinnati, Ohio

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Public Good Will — Keep Them UP With — Economical Operation

KEYSTONE
Safety Car Specialties

Air Sanders
Golden Glow Headlights
Illuminated Destination Signs
Steel Gear Cases
Lighting Fixtures
Motormen's Seats
Faraday Car Signals
Trolley Catchers
Shelby Trolley Poles
Samson Cordage
International Fare Registers
Fare Register Fittings
Air Valves
Cord Connectors
Rotary Gongs
Standard Trolley Harps
Standard Trolley Wheels
Automatic Door Signals
Trailer Connectors

Keep the good will of your riders with you—

(1) By making it easy for them to recognize the destination points of your cars—with Keystone-Hunter Illuminated Signs.

(2) By making it convenient for them to signal the motorman—with the reliable Faraday Car Signal System.

(3) By keeping your cars invitingly illuminated—with Safety Lighting Fixtures that do not rattle or break the glassware.

(4) By giving them the protection afforded by the non-blinding but penetrating beams of "Golden Glow" light. Headlights bearing this label are safety lights—safety in operation—safe investment.

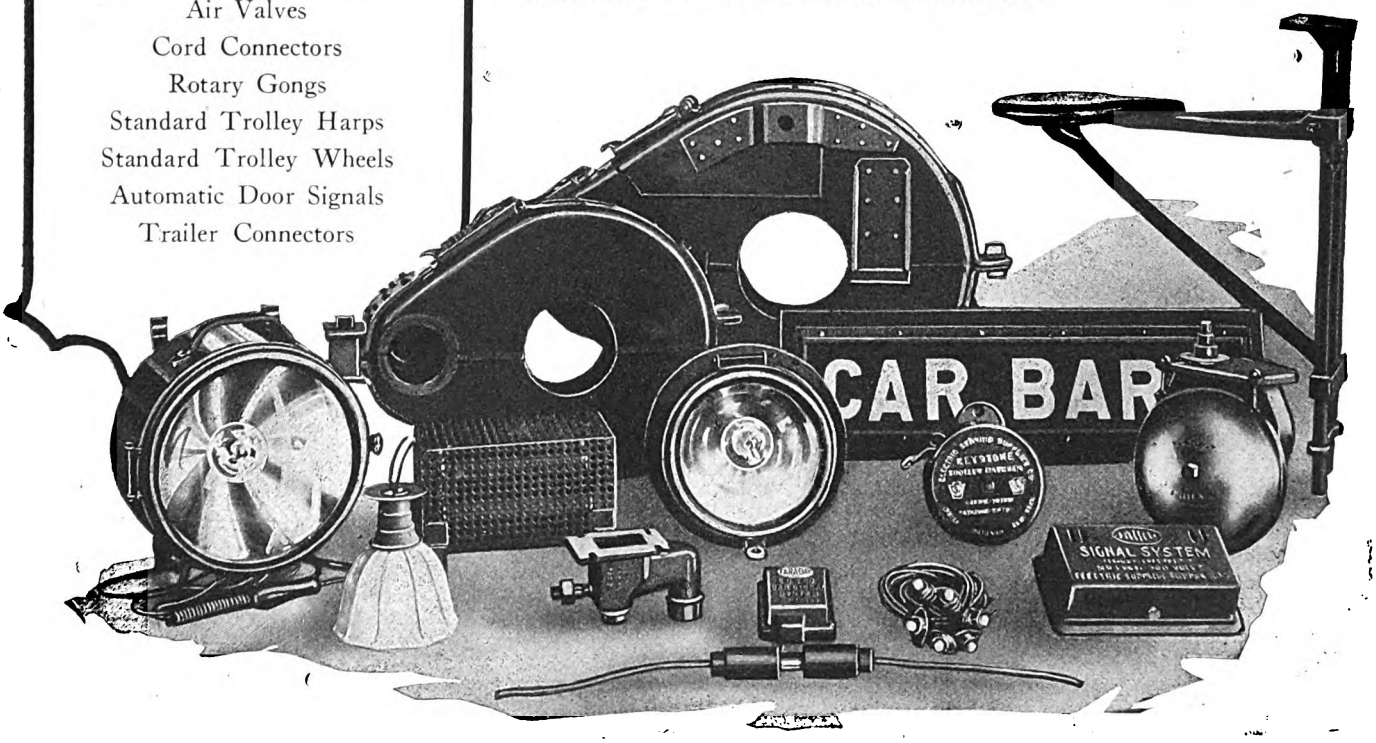
Anything that keeps your riders good natured and content to ride in your cars is a good investment at any price. For this and the reason of their quality Keystone Car Specialties are builders of Good Will and Economical operation.

ELECTRIC SERVICE SUPPLIES Co

Manufacturers of Railway Material and Electrical Supplies.

PHILADELPHIA 17th and Cambria Street — NEW YORK 50 Church Street — CHICAGO Monadnock Bldg.

Branch Offices: Boston, Scranton, Pittsburgh. Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg, Vancouver.



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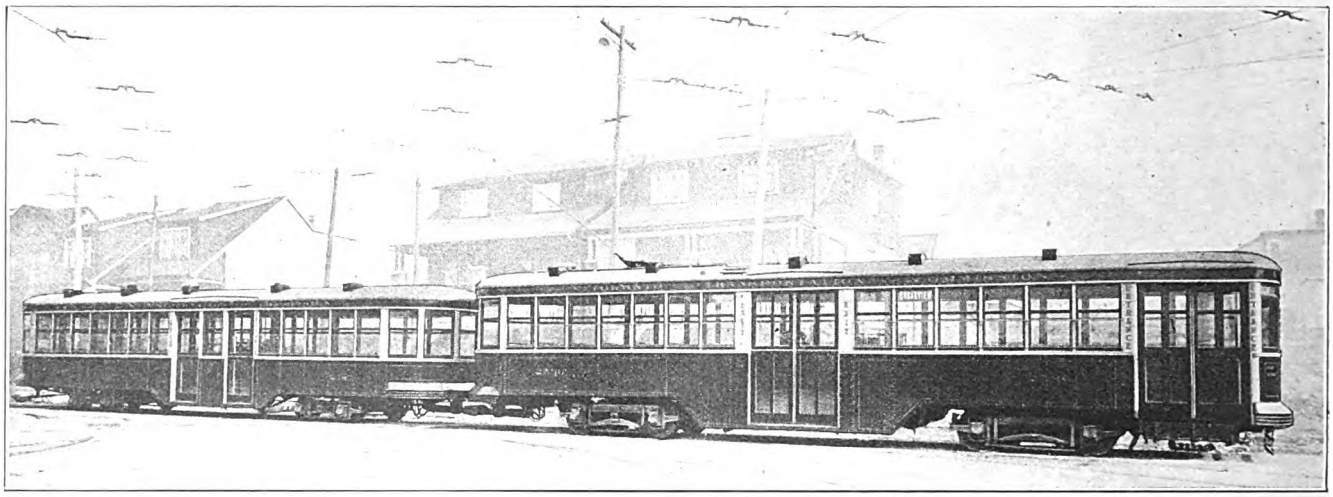

In Toronto

A Fresh Start and a Right Start with

NATIONAL PNEUMATIC TRAIN DEVICES

The greatest city transit modernization of the day is that being carried out by the Toronto Transportation Commission as a part of its program of rehabilitating the system purchased from the Toronto Street Railway.

Beginning almost afresh, the Commission has been selecting the best in every department of transportation.

Which accounts for its selection of the door control and safety features of this company for its new rush-hour trains comprising a total of 190 motor cars and 60 trailers in addition to NATIONAL PNEUMATIC equipment purchased by the preceding private management.

Could anything be more significant?

Let us have your inquiry

Manufactured in Canada by
Dominion Wheel & Foundries, Ltd.
Toronto, Ont.

National Pneumatic Company, Inc.
Originator and Manufacturer
50 Church St., New York Edison Bldg., Chicago
Works: Rahway, N. J.

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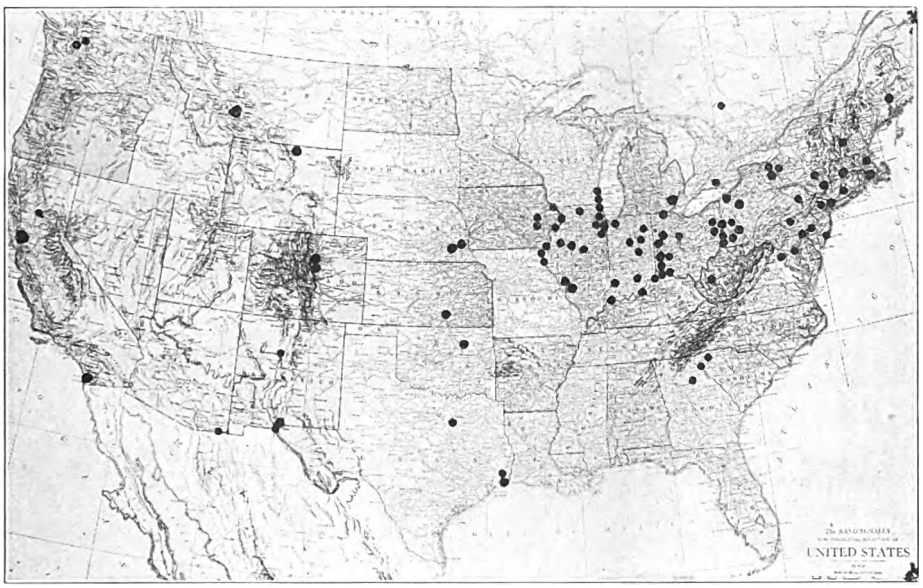
ECONOMY METERS

STANDARD ON OVER 100 ROADS

FOR POWER SAVING AND CAR INSPECTION



Every dot on this map represents a property that has *standardized on* Economy Meters.

It points out a nation-wide interest in car energy metering.

Your road can make savings comparable with the savings which Economy Meters have induced on these properties.

Let us explain, in detail, how Economy Power-Saving Meters tell you without trouble.

"The Watchdog of Your Power and Equipment"

1. WHO are your careful, economical motormen.
2. WHICH motormen need instructing in proper handling of car equipment.
3. HOW much power is being saved by motormen collectively and individually, by direct-reading units of power.
4. HOW much power is being used on any section of your lines.
5. HOW much power is being used in trailer service.
6. HOW much power your freight and express service is using.
7. HOW much power is being used for switching and car movements in yards.
8. WHAT is the line loss on your D.C. distribution.
9. WHEN your schedule speeds are too high or too low.
10. WHAT is the most economical equipment for any service.
11. WHAT are the proper gear ratios for given service conditions.
12. WHEN each car should be inspected.

Economy Electric Devices Company

L. E. GOULD, Pres.

1590 Old Colony Bldg., Chicago

Some 1921 Orders

Allegheny Valley Ry.
Buffalo & Lake Erie
Claremont Railway
Citizens Traction
Cincinnati Traction
Denver Tramway
East St. Louis Ry.
Empire State Railway
Evansville & Ohio Valley
Ft. Wayne, Van Wert & Lima
Holyoke Street
Indianapolis & Louisville
Indiana Rys. & Lt
Interstate Public Service
London & Port Stanley
Morris County Traction
New York, New Haven & Hartford
Omaha, Lincoln & Beatrice
Pennsylvania-Ohio Electric
Quincy Railway
Sacramento-Northern
Seattle & Ranier Valley
Southern Pennsylvania
Union St. Ry. New Bedford
Tulsa Street Railway
Washington-Virginia Ry.
Wichita Ry. & Lt. Co.

Some 1922 Orders

Bloomington & Normal
Dayton Street Railway
Denver Tramway
East St. Louis Ry.
Interstate Public Service
Lincoln Traction
Louisville Railway
Milwaukee Elec. Ry. & Lt.
Paulista (Brazil) Ry.
Peoria Railway
Philadelphia Rapid Transit
Port Arthur Traction
Poughkeepsie & Wappinger Falls
San Diego Electric Ry.
So. N. Y. Pwr. & Ry. Corp'n
St. Louis Elec. Terminal
The Hague Tramway
Toledo & Western
Union Traction of Ind.
Utrecht Tramway
Western Ohio Ry.
West Penn Railways
Wheeling Traction
Youngstown & Suburban

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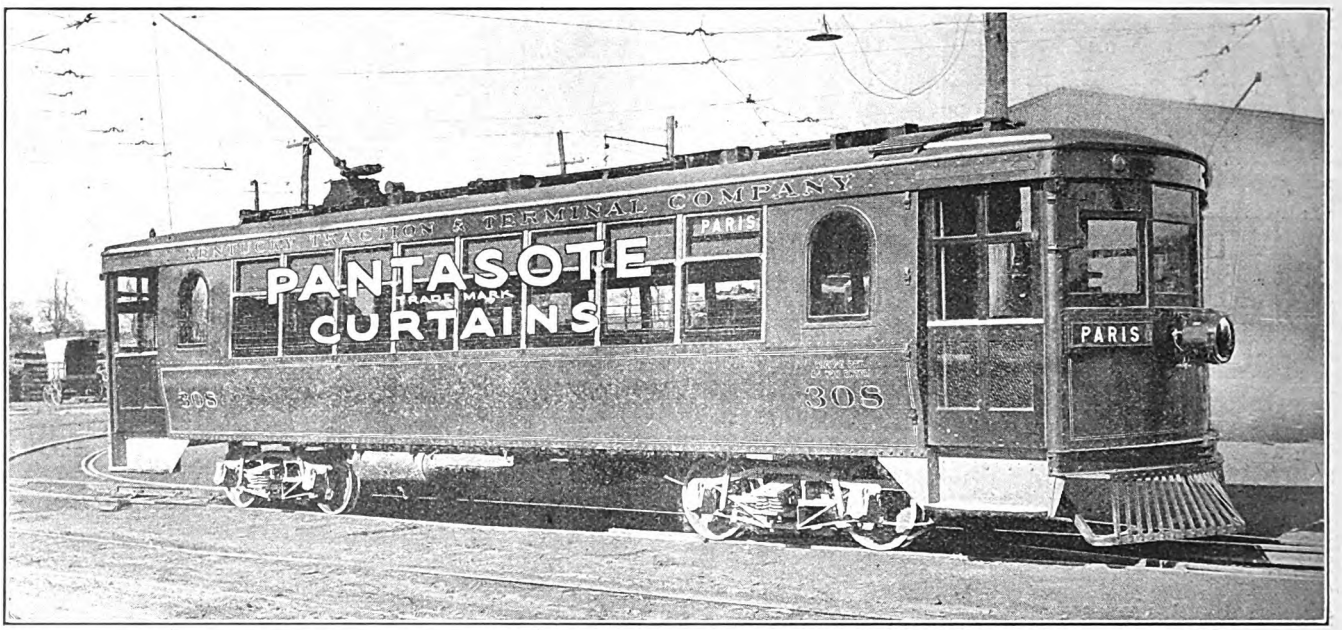

10 New Cars

—big interurbans, built by the Cincinnati Car Company and now in operation by the

Kentucky Traction & Terminal Co.

They have—

AGASOTE
(Trade Mark)
Headlinings and
PANTASOTE
(Trade Mark)
Curtains

THE PANTASOTE COMPANY
11 Broadway, New York Peoples Gas Bldg., Chicago
751 Monadnock Bldg., San Francisco

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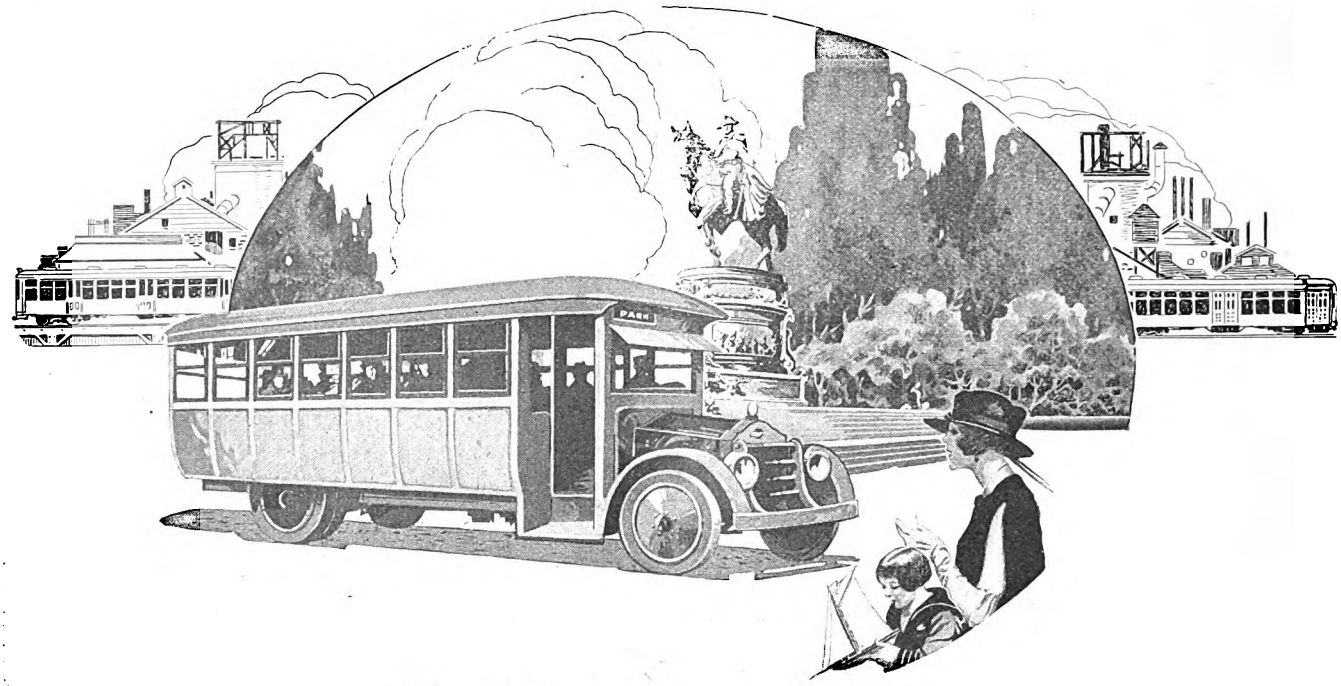

Cashing in on Desire

People LIKE to ride in motor cars.

The rapid growth of the automotive industry is proof positive of this fact.

People nowadays ride in street cars from necessity, not from choice.

You can cash in on the pleasure-riding desire of the public with a **MITTEN-TRAYLOR MOTORBUS,** "the poor man's automobile.

The **MITTEN-TRAYLOR MOTORBUS** is built exclusively for the purpose of carrying passengers comfortably, safely and profitably.

No railway man would think of attempting to adapt a freight car for passenger service. Isn't it just as illogical to try to make a BUS out of a MOTOR TRUCK?

The exclusive HIFLEX spring suspension gives to the **MITTEN-TRAYLOR MOTORBUS,** on solid tires, the riding qualities of a pleasure car on pneumatics. Roomy, deep-springed seats add to the ease of riding.

This easy-riding feature not only attracts passengers, but keeps down costly repair bills—adds to the life of tires and increases the safety of bus operation.

The Mitten-Traylor Motorbus

is not confined to tracks or set routes. It can leave the hot paved streets of the city and follow the whims of the riding public along pleasant shaded drives.

By catering to pleasure-riding patronage, the most successful bus operator in America has built up this "off-peak" business to an extremely profitable degree.

You too can add to your profits by investing in **MITTEN-TRAYLOR BUSES,** and cash in on the automobile-riding desire of thousands who can't afford a car.

Mitten-Traylor Incorporated offers you the services of its transportation experts for consultation on your problems.

MITTEN-TRAYLOR

INCORPORATED

Philadelphia

MITTEN TRAYLOR

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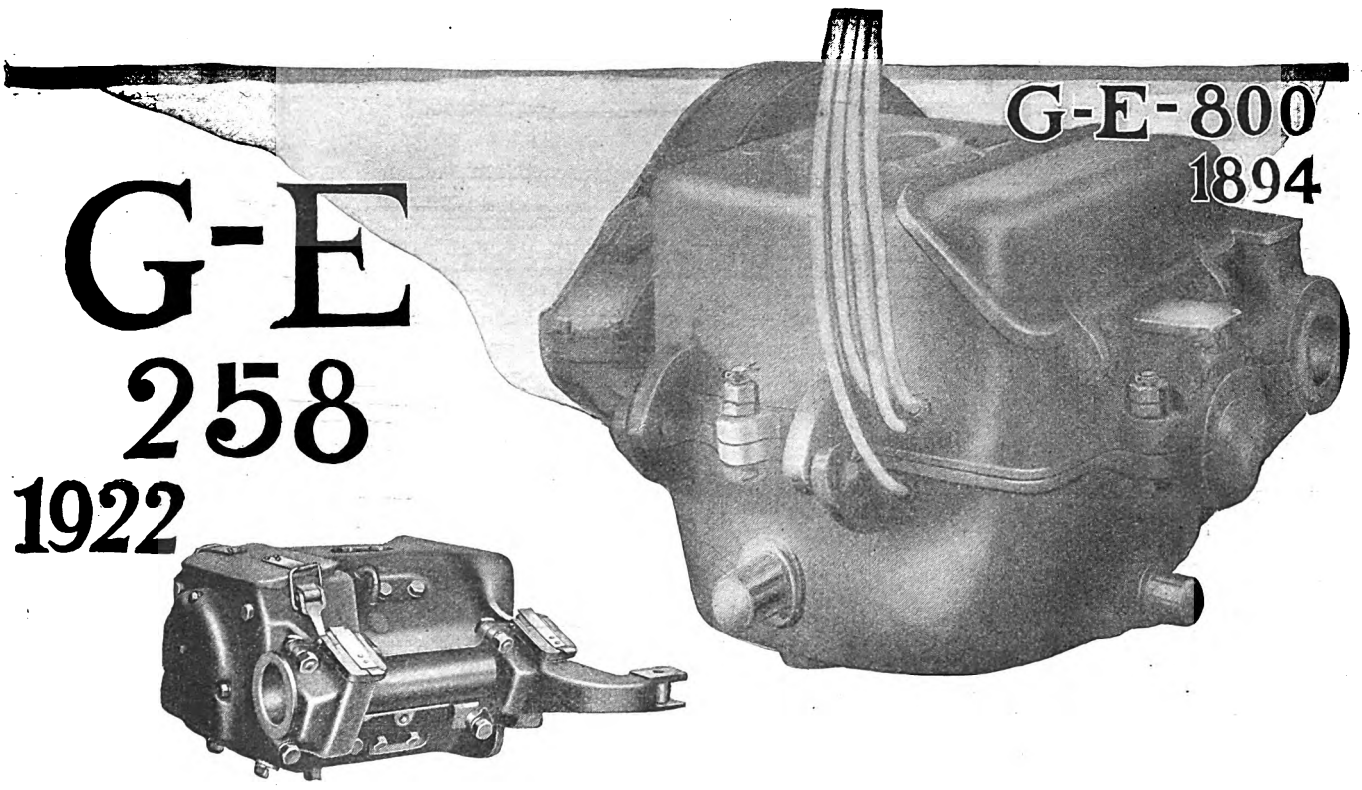
The spirit of true leadership is not merely to get to the front but to stay there



Yesterday and Today in Railway Motors

The GE-800 of 1894 weighed 1930 pounds, which was at that time a comparatively light-weight motor.

The GE-258 motor of today weighs but 885 pounds and is capable of as much work as its distant predecessor.

The old motor was fully enclosed and had no commutating poles, whereas the self-ventilation and commutating poles of the GE-258 give it so liberal an overload capacity that it has become the favorite motor for safety cars and light-weight interurban cars where schedule speeds combined with maximum reliability are controlling factors.

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

25-140

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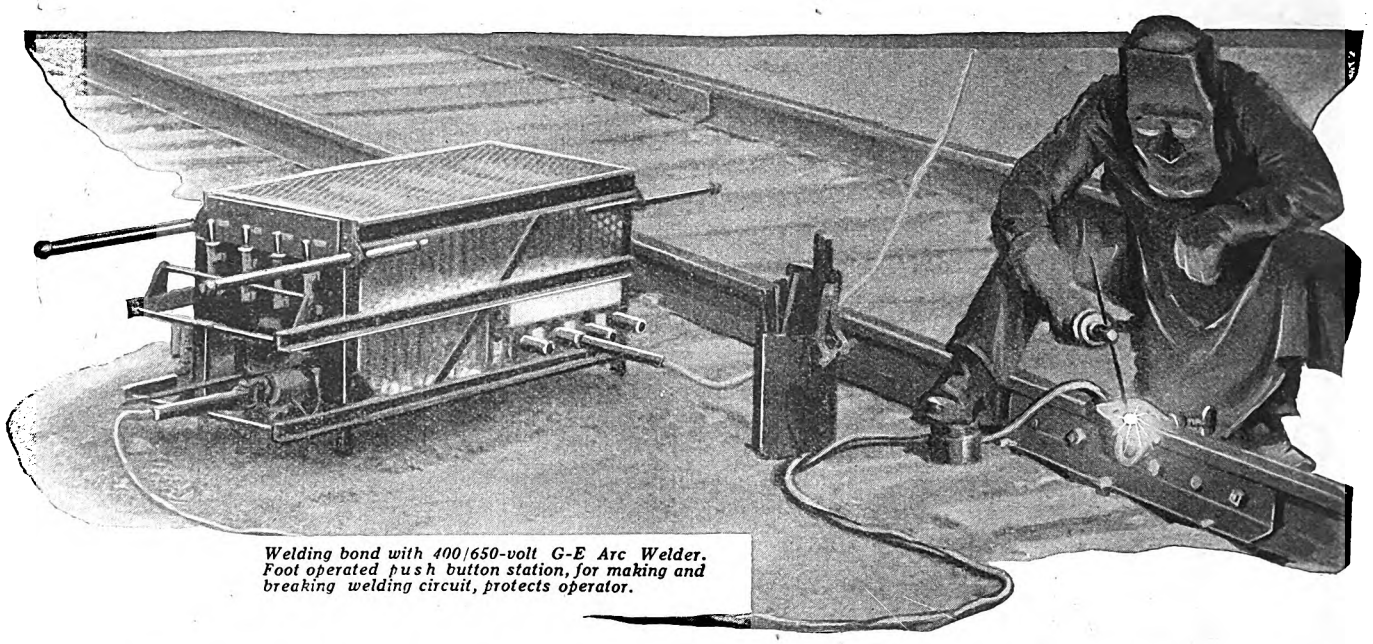
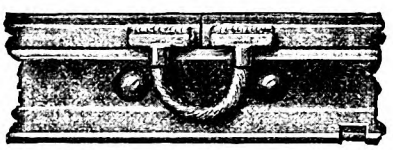
Good Bonding is fundamental to improved service at less cost. Invest in it.

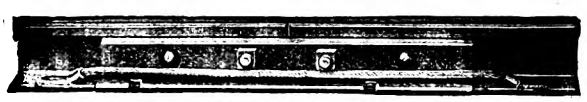


Welding bond with 400/650-volt G-E Arc Welder. Foot operated push button station, for making and breaking welding circuit, protects operator.



Form SF-1, made single and double conductor, for attaching to rail head. Readily applied without tearing up pavement.

Form SF-4 bond with steel terminals to fit the angle between the web and base of the rail.



Form SF-6 for application around the joint plate. Designed to be attached to top of rail flange.

Use G-E Welded Bonds

Think of an unbonded joint as an open circuit—that's what it is, practically. The high resistance causes a voltage drop that you pay for in impaired service and increased cost of repairs to motors operating on abnormally high current. And there is an energy loss that's bound to show up in your power or coal bill.

To do without good bonding is to practice false economy. You might as well try to run machinery without lubrication.

Rails as long as the system and without a joint would be ideal. Impossible, of course. But with welded bonds the track, as an electrical circuit, *is without a joint.* Furthermore, welded bonds are more easily and cheaply applied.

Ask our nearest Sales Office about G-E rail bonds and G-E equipment to weld them.

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

40-236

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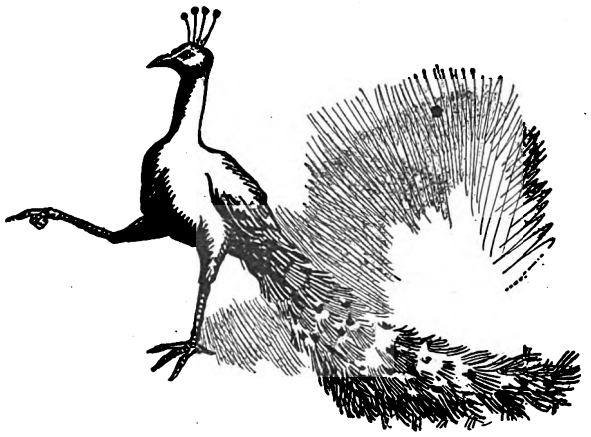
—here is the standard brake for safety cars



the PEACOCK Staffless Brake

A Reputation Established!

1. Not an experiment -- it has been safely satisfying the exacting requirements of safety car service for years.
2. Occupies minimum platform space — the pressed steel housing projects only 3¼ inches into the vestibule from the dash.
3. Has at least three times the power of the ordinary type of hand-brake — and almost unlimited chain-winding capacity.
4. Before being convinced, compare it point by point with any other hand brake made. Consider power, speed, capacity—***and established reputation.***

Specify Peacock Staffless

NATIONAL BRAKE COMPANY, INC.

890 ELLICOTT SQUARE, BUFFALO, NEW YORK

Canadian Representative: Lyman Tube & Supply Co., Montreal, Can.

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Bankers and Engineers

Ford, Bacon & Davis
Incorporated
Business Established 1894
115 BROADWAY, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

THE J. G. WHITE ENGINEERING CORPORATION
Engineers—Constructors
Industrial Plants, Buildings, Steam Power Plants, Water Powers, Gas Plants, Steam and Electric Railroads, Transmission Systems
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Reorganization Management Operation Construction
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Consulting Engineers
Specializing in Utility Rate Cases and Reports to Bankers and Investors
1017 Olive St., St. Louis, Mo.

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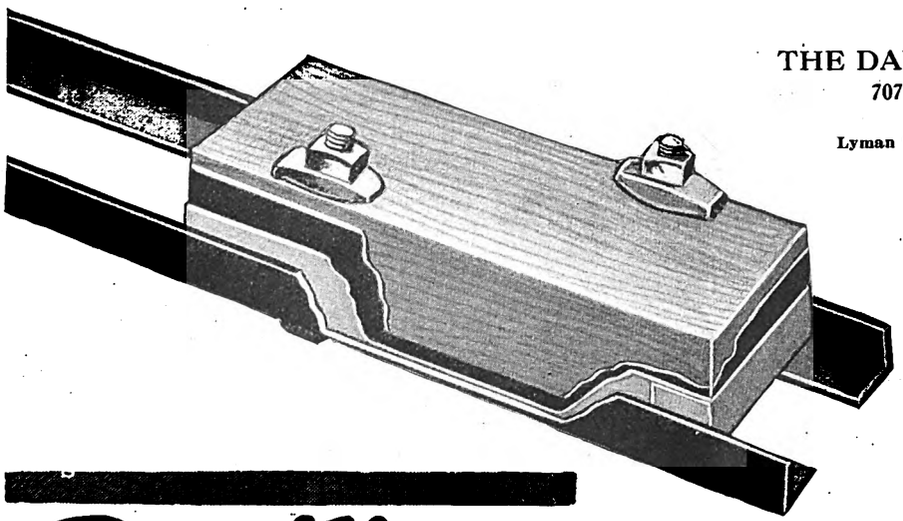
ON THE ROLLING STOCK AND

Permanent—Noiseless—Economical

Concrete furnishes the best and most durable track foundation *if* you provide a shock absorber. Without it the concrete will pulverize from the hammer blow of traffic.

The asphalt cushion in the Resilient Railway Tie provides the shock absorber, dissipates the hammer blow and preserves the concrete.

Build your track with no comeback.



THE DAYTON MECHANICAL TIE CO.
707 Commercial Building, Dayton, Ohio
Canadian Representative:
Lyman Tube and Supply Co., Ltd., Montreal, Quebec

Resilient TIE

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COLUMBIA SERVICE

Your road may require shop tools for facilitating repair work in your own shops—The Columbia Company can furnish what you need.

Your road may require shop work such as the making of equipment; you can use Columbia Machine Shops as you would your own plant for this work—at a substantial saving to you.

You may require special castings or forgings either in quantities or just in limited numbers—The Columbia Company can give you what you wish.

We specialize on serving Electric Railways—we have agents in all parts of the country who will work with you.

Let us tell you how Columbia Service can be utilized by your road.

COLUMBIA MACHINE WORKS

&

MALLEABLE IRON COMPANY

3303 ATLANTIC AVENUE, BROOKLYN, N. Y.

AGENTS—BOSTON, ATLANTA, CHICAGO, SAN FRANCISCO

REPAIR AND SHOP MACHINERY, ARMATURE AND AXLE BEARINGS, ARMATURE AND FIELD COILS, TROLLEY WHEELS AND POLES, RAILWAY MOTOR PARTS, CONTROLLER PARTS, RESISTANCE GRIDS, AIR BRAKE PARTS, CAR TRIMMINGS, LINE MATERIAL, TRUCK PARTS, GEAR CASES, FORGINGS, CASTINGS

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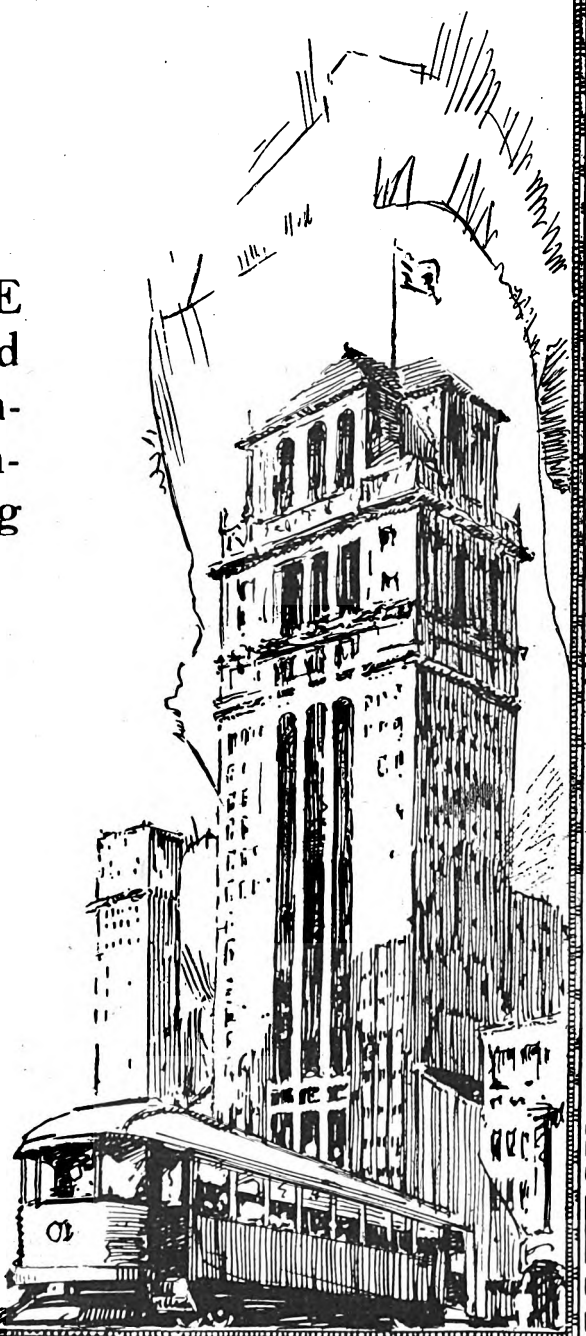
COLLIER SERVICE sustains car card space value by maintaining a nation-wide organization of car advertising experts.



CANDLER BUILDING, THE HOME OF COLLIER SERVICE.

Barron G. Collier INCORPORATED

CANDLER BLDG NEW YORK

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"Two Bells for Better Business"

"Two Bells!"—Let's start!

The 1922 Convention of the American Electric Railway Association is on the way with its big exhibit to be displayed on Chicago's great Municipal Pier during the first week of October.

The Exhibit has proved to be one of the high spots of past conventions. It has been the feature that built up a big attendance. This year's Exhibit, the first since 1920 and only the second since 1918, will arouse unusual interest and attract increased attention.

As in past years, *Electric Railway Journal* will devote two special issues to helping its readers and its advertisers make the most of the Convention and the Exhibit.

Annual Convention Number

(Dated September 23, 1922)

Convention Report Number

(Dated October 7, 1922)

The two convention issues of the *Electric Railway Journal* will enable manufacturers to capitalize their exhibits and draw visitors, to impress on the field the ideas back of their selling campaigns and to give the entire electric railway industry a strong buying stimulus.

Electric Railway Journal is read weekly—text and ads—by the men who do from 98 to 99 per cent of the world's electric railway buying. This publication therefore delivers to its advertisers by far the largest, most influential and most interested audience that is available anywhere. *Electric Railway Journal* covers the field completely—north, east, south, and west.

Start now. "Give two bells for better business;"—one bell your decision to attend the Convention, the other bell your prompt action in reserving advertising space in the *Electric Railway Journal's* Convention issues. Regular rates apply. Tell us to send you suggestions for an effective piece of advertising copy.

ELECTRIC RAILWAY JOURNAL
Tenth Ave. at Thirty-sixth St., New York

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"Not only to make better products but to make them better understood—not only to sell but to serve, assisting those who buy to choose as well as use their purchases—this is the privilege if not the practice of all modern manufacturers."—*Vauclain.*

Bulletin No. 2

SOMETHING YOU CAN USE

Purchasers will find the Standard Steel Works Handbook of the greatest practical assistance not only in the selection but in the use, care and maintenance of the products listed in this advertisement.

- Steel Tires
- Steel Tired Wheels
- Solid Forged and Wrought Steel Wheels
- Rolled Steel Gear Blanks
- Steel Axles
- Steel Springs
- Steel Forgings
- Steel and Malleable Iron Castings
- Rolled Steel Rings
- Steel Crusher-Rolls and Shells
- Steel Pipe Flanges

STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

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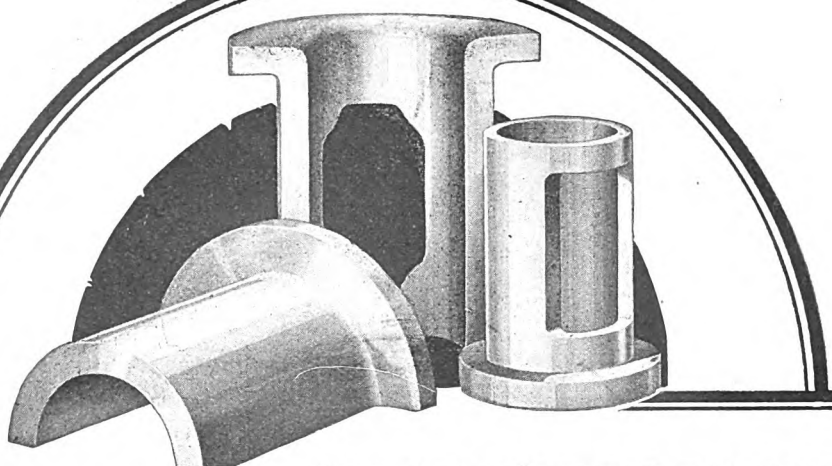
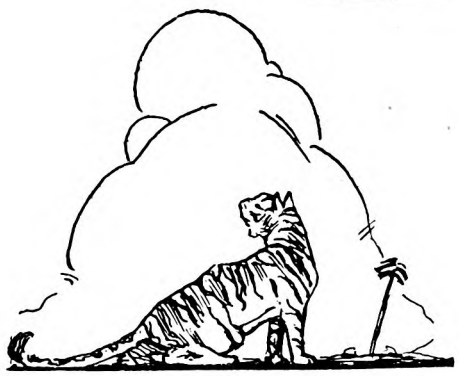


"TIGER" BRONZE



AXLE and ARMATURE BEARINGS

PROVE TO YOUR OWN SATISFACTION—that there is a direct, dollars and cents, saving in the cost of operating cars, equipped with "Tiger" Bronze Axle and Armature Bearings.

Put them to any test and judge them by the service they render, in comparison with any other bearings made.

Your test will prove that "Tiger" Bronze has a very slow and even rate of wear, which results in correct bearing alignment and far greater mileage.

We will be glad to cooperate with you in getting maximum bearing service for your cars at minimum cost. Let us supply you with complete information on "Tiger Bronze."

TROLLEY WHEELS:
V-K Oilless, M-J Lubricated
HARPS: V-K *Non-Arcing*
BEARINGS: *"Tiger" Bronze Axle and Armature*
ARMATURE BABBITT
and Similar Products

MORE-JONES

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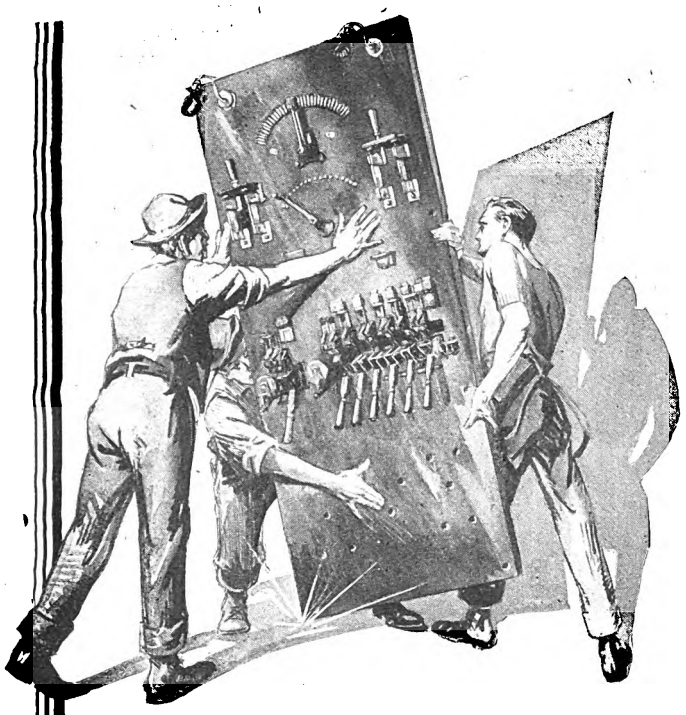


The lightest insulating base is the strongest

HERE is a switchboard material that combines the qualities of lightness and strength. Johns-Manville Ebony Asbestos Wood has a higher mechanical strength than soapstone, slate, or marble; yet with two-thirds their weight.

Stronger electrically, too

Ebony Asbestos Wood has a higher electrical insulation and puncture resistance than any of these quarried materials, even when they are without flaws—which is not often the case.

Manufactured by formula, Ebony Asbestos Wood is not subject to flaws, cracks, or metallic veins. Every piece is a solid homogeneous block of cemented asbestos fibre impregnated with a highly efficient dielectric compound.

Best for all uses

The result is an insulating base comparable to mica or hard rubber in efficiency. Yet it is rigid, strong, permanent and can be readily worked. High quality demands Ebony Asbestos Wood for all severe requirements—low price justifies it for ordinary use. Send for a booklet.

JOHNS-MANVILLE, Inc.
Madison Avenue at 41st St., New York City
Branches in 56 Large Cities
For Canada: Canadian Johns-Manville Co., Ltd., Toronto

COVERS THE CONTINENT
Through
ASBESTOS
and its allied products
Electrical Materials
Brake Linings
Insulations
Roofings
Packings
Cements
Fire Prevention Products

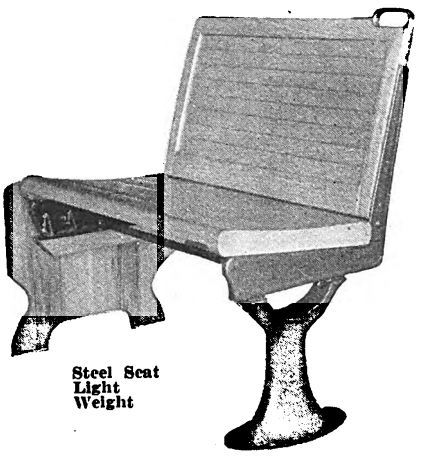
JOHNS-MANVILLE
Ebony Asbestos Wood

Hale & Kilburn SEATS

All Steel Seat
Rattan Spring Cushion

Lead the World in the qualities that count

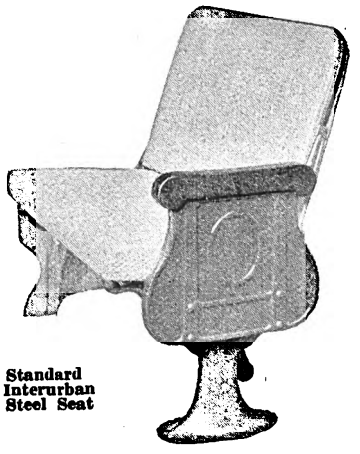
Neatness
Lightness
Simplicity
Strength
and



Steel Seat
Light
Weight

No Costlier Than Others

Write for Particulars



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Steel Seat

Hale & Kilburn Corporation

American Motor Body Co., Successors

Works: Philadelphia

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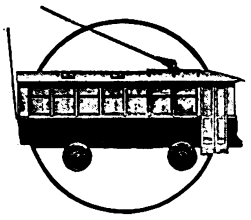
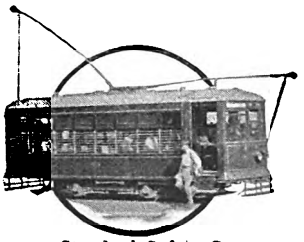
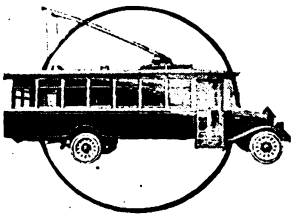
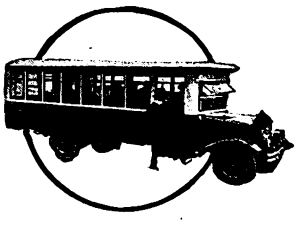

Tracklesstrollicar Safety Car Type


Standard Safety Car


Tracklesstrollicar Automotive Type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—four of a kind

The "Quality" Kind

Whether you are buying standard electric railway cars or calling for a new deal in trackless transportation, it will pay you to draw on St. Louis "Quality" resources for your new equipment.

St. Louis Car Company
St. Louis, Mo.
"The Birthplace of the Safety Car"

Don't Overlook Opportunities

Men who regularly keep in touch with the market through other channels often overlook the many opportunities that are to be found in the

SEARCHLIGHT SECTION
For Every Business Want
"Think SEARCHLIGHT *First"*

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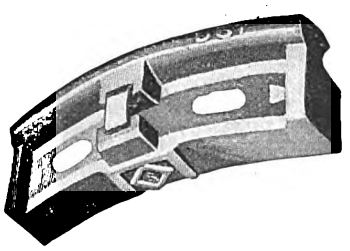
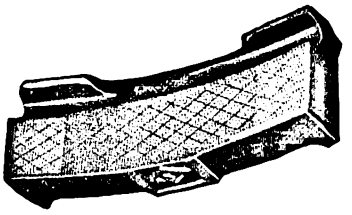
Brake Shoes
A. E. R. A. Standards

Diamond "S" Steel Back is the Best Type



Standard Patterns for

SAFETY CAR



D-67 for Narrow Treads
D-87 for Wide Treads

American Brake Shoe and Foundry Co.
30 Church Street, New York
332 So. Michigan Ave., Chicago Chattanooga, Tenn.

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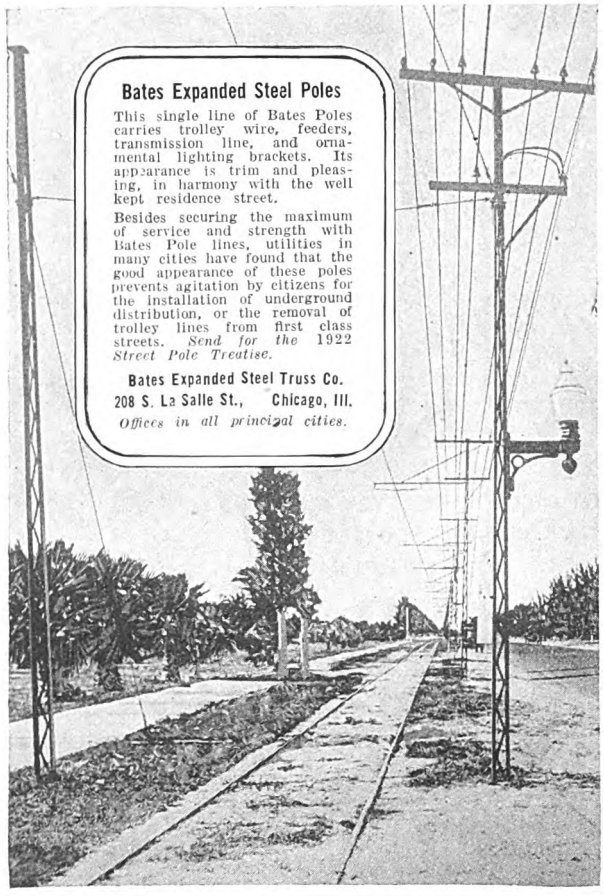

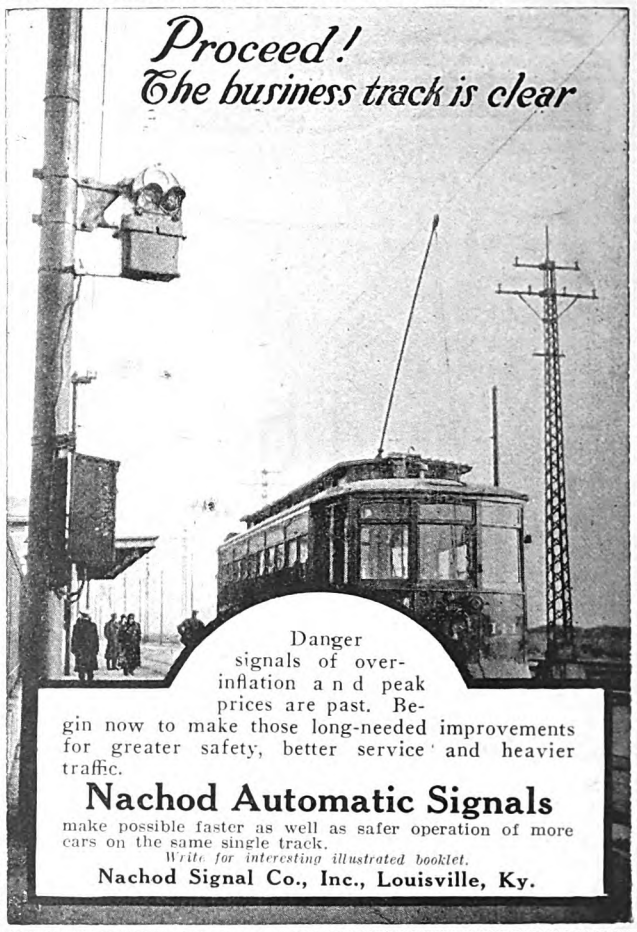

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Galveston, Texas

Plant—Texarkana Beaumont Galveston

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Treated railway ties, poles, piling, bridge timbers, etc.

See our full page advertisement in last week's issue.

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"the only SAFE PLIERS for linemen and all high tension work"

Semi-soft rubber insulation bonded to metal by *Elchemco* process.

Tested and passed for 10,000 volts by the Electrical Testing Laboratories of N. Y. City.

6", 7", 8", 9"

Insulation cannot crack or work loose

Rubber Insulated Metals Corporation
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Distributed by The Electric Service Supplies Co., and other distributors
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Cross Ties: White Oak, Chestnut, and Treated Ties.
Oak Switch Ties.
Prompt shipment from our own stocks.
Headquarters—Nashville, Tenn.
A. D. Andrews, Terre Haute, Ind., Representative.

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Third Rail Insulators, Trolley Bases, Harps and Wheels, Bronze and Malleable Iron Frogs, Crossings, Section Insulators, Section Switches.
Albert & J. M. Anderson Mfg. Co.
289-93 A Street, Boston, Mass.
Established 1877
Branches—New York, 135 B'way.
Philadelphia, 429 Real Estate Trust Bldg. Chicago, 105 So. Dearborn St.
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Nelsonville Filler and Stretcher Brick for T Rails

Makes permanent, light, level pavement with a minimum of paving repairs.
The Nelsonville Brick Co.
Columbus, Ohio

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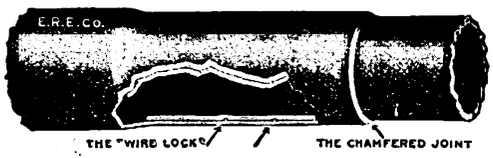

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Lowest Cost **Lightest Weight**
Least Maintenance **Greatest Adaptability**

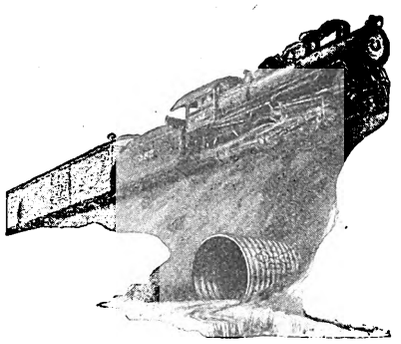
Catalog complete with engineering data sent on request

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street

TONCAN METAL
CORRUGATED CULVERTS

Under Electric and Steam Railways,—where dependable culverts are needed, install those made of anti-corrosive Toncan Metal. It endures! Toncan Culverts installed 14 years ago are still in excellent condition. We make both "ACME" (Nestable) and IMPERIAL Riveted Corrugated Culverts of Toncan. From either you may expect long service. Write for prices.

The Canton Culvert & Silo Co.,
Canton, Ohio.



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TROLLEY WIRE
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PAPER INSULATED UNDERGROUND CABLE
MAGNET WIRE

Reg. U. S. Pat. Office
Galvanized Iron and Steel Wire and Strand
Incandescent Lamp Cord

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 112 W. Adams; Cincinnati, Traction Bldg; New York, 233 B'way; San Francisco, 612 Howard; Seattle, 100 1st Ave. So.

U. S. Electric Contact Signals
for
Single-track block-signal protection
Double-track spacing and clearance signals
Protection at intersections with wyes
Proceed signals in street reconstruction work

United States Electric Signal Co.
West Newton, Mass.

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Rail Bonds and Trolley Line Specialties

Flood City Mfg. Co., Johnstown, Pa.

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Manufacturers of
Electric Wires and Cables of all kinds;
also Cable Terminals, Junction Boxes, etc.

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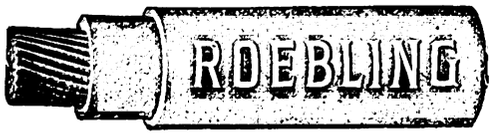

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Transmission Line and Special Crossing Structures, Catenary Bridges

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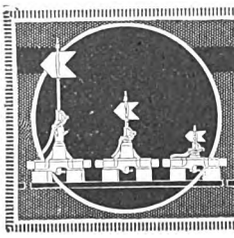
Engineers and Contractors SYRACUSE, N. Y.

Peirce Forged Steel Pins with Drawn Separable Thimbles

Your best insurance against insulator breakage

Hubbard & Company
PITTSBURGH, PA.



RAMAPO

Automatic Return Switch Stands for Passing Sidings
Automatic Safety Switch Stands
Manganese Construction · Tee Rail Special Work

RAMAPO IRON WORKS
HILLBURN · NEW YORK
Plants at Hillburn N.Y. and Niagara Falls N.Y. New York Office 30 Church St.

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THE INDIANAPOLIS SWITCH & FROG CO., SPRINGFIELD, OHIO

Indianapolis Economy Products That Make Dollars "Grow"

Indianapolis Solid Manganese:
Frogs, Crossings, Mates and Tongue-switches. Super-quality material, Par-excellent designs. Gives many lives to one, of ordinary construction, and when worn down, CAN BE RESTORED by INDIANAPOLIS WELDING.

Indianapolis Electric Welder:
Efficient, Rapid, ECONOMICAL, Durable. Price, $2.00 (per day for three hundred days) thoroughly dependable every day in the year, upkeep about 75 cents per month. LAST A LIFE TIME.

Indianapolis Welding Steel:
Fluxated heat treated Metal Electrodes, insure Uniform Dependable Welds that are from 75 per cent to 100 per cent more efficient, than the "MELT," from the same High Grade basic stock, untreated.

Indianapolis Welding Plates:
Eliminate "Joints" and "Bonds" in Street Track. Higher in Strength and Conductivity than the unbroken Rail. Installed according to instructions, have proven THOROUGHLY DEPENDABLE, during 10 YEARS, of "Time and Usage" TEST. Extensively used in 48 STATES and COUNTRIES. Recognized as paramount MAINTENANCE ELIMINATORS.

Indianapolis Welding Supplies:
CABLES, HELMETS, LENSES, CARBONS.

Turntables:
Ball-bearing, for ash-pits, storage yards, etc.

Indianapolis "Economy" Products
are Pre-eminently "Money Savers," YES—"Money Makers" for Electric Railways.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of Water Tube Boilers of continuing reliability

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Makers of Steam Superheaters since 1898 and of Chain Grate Stokers since 1893

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High-Grade Track Work

SWITCHES—MATES—FROGS—CROSSINGS
COMPLETE LAYOUTS
IMPROVED ANTI-KICK BIG-HEEL SWITCHES
HARD CENTER AND MANGANESE CONSTRUCTION

New York Switch & Crossing Co.
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205 Broadway, Cambridgeport, Mass.
Established 1858

Manufacturers of
Special Work for Street Railways

Frogs, Crossings, Switches and Mates
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Kerwin Portable Crossovers
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ESTIMATES PROMPTLY FURNISHED

SPECIAL TRACKWORK

Of the well-known **WHARTON** Superior Designs *and* Constructions

STEEL CASTINGS	FORGINGS	GAS CYLINDERS
CONVERTER AND ELECTRIC	DROP, HAMMER AND PRESS	SEAMLESS STEEL

WM. WHARTON JR. & CO., Inc., Easton, Pa.
(Subsidiary of Taylor-Wharton Iron & Steel Co., High Bridge, N. J.)

ORIGINATORS OF
MANGANESE STEEL IN TRACKWORK

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ECONOMICAL
EFFICIENT
RAIL BONDS

THE ELECTRIC RAILWAY IMPROVEMENT CO.
CLEVELAND, OHIO

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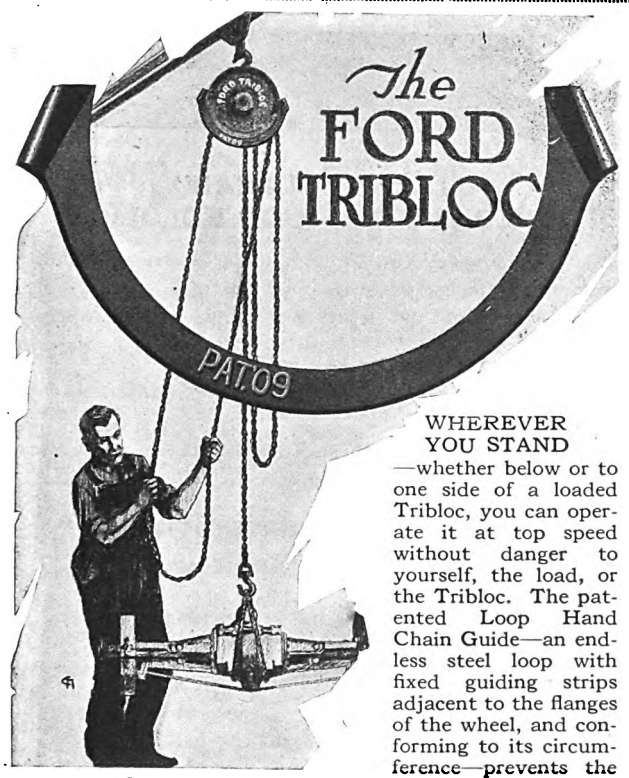

WHEREVER YOU STAND

—whether below or to one side of a loaded Tribloc, you can operate it at top speed without danger to yourself, the load, or the Tribloc. The patented Loop Hand Chain Guide—an endless steel loop with fixed guiding strips adjacent to the flanges of the wheel, and conforming to its circumference—prevents the hand chain from gagging or over-riding its wheel, no matter the speed or angle of operation. For loads up to 40 tons—*swift, easy and safe.* 2208-D

Ford Chain Block Co.
2nd and Diamond Streets
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Overseas Representatives:
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UNITED STATES
TWIN TERMINAL
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Arc Weld and Flame Weld

Send for new Rail Bond book

American Steel & Wire Company
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Electrical Machinery, Steam Turbines, Steam Engines, Condensers, Gas and Oil Engines, Air Compressors, Air Brakes

RAILWAY MOTOR BRUSHES

N C C COLUMBIA 203

Grade 203, produced by research and proved by test, the most satisfactory and lowest cost-per-car-mile brush obtainable for A. C. commutator type railway motors. One of a series of standard railway motor brushes.

COLUMBIA BRUSHES
COST NO MORE — LAST LONGER
NATIONAL CARBON COMPANY, INC.
CLEVELAND, OHIO SAN FRANCISCO, CAL.

THE CUTTER ELECTRICAL AND MANUFACTURING CO. CIRCUIT I-T-E BREAKERS PHILADELPHIA

I. T. E.
Circuit Breakers

for heavy street railway work are the best obtainable. Write for New Complete Catalogue.

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FOR
CARBON ARC RAIL JOINT WELDING
CARBON ARC RAIL BONDING
CARBON and METALLIC ARC GENERAL WELDING

Rail Welding and Bonding Co., Cleveland, O.

HACKSAW HIGH SPEED GLADIUM ECONOMY EFFICIENCY BLADES
GLADIUM CO. Inc. 34 Cliff St. New York

FOSTER SUPERHEATERS

A necessity for turbine protection, engine cylinder economy and utilization of superheat for all its benefits

POWER SPECIALTY COMPANY, 111 BROADWAY, NEW YORK
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TULC
A LUBRICANT

We make a specialty of

ELECTIC RAILWAY LUBRICATION

We solicit a test of TULC on your equipment.

The Universal Lubricating Co.
Cleveland, Ohio

WILLIAMS' "VULCAN" FORGED-CUTTER TOOL HOLDERS

For continuous heavy cuts at high speed on lathe, planer, shaper, etc. Change the cutter, *not* the tool, and get all the advantages of the solid bar without its expense. Literature?

J. H. WILLIAMS & CO.
"The Drop-Forging People"

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A New Lever Change Carrier

Can be adjusted instantly, and without tools, to throw out any number of coins from 1 to 5. Accurate. Fast. Will not jam. Size, weight and capacity right. Ejector spring a marvel. Write us.

Manufacturer's Distributor

The Cleveland Fare Box Co.
Cleveland, Ohio
CANADIAN CLEVELAND FARE BOX CO., Ltd., Preston, Ont.

CLEVELAND FARE BOXES ALWAYS FIT THE FARE AND FARE COLLECTION SYSTEM

Type R-10

International Registers

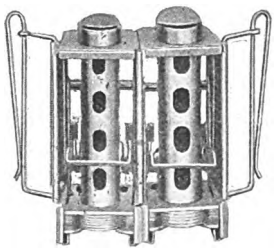
Made in various types and sizes to meet the requirements of service on street and city system.

Complete line of registers, counters and car fittings.

Exclusive selling agents for HEEREN ENAMEL BADGES.

The International Register Co.
15 South Throop Street, Chicago, Illinois

JOHNSON Universal Changer



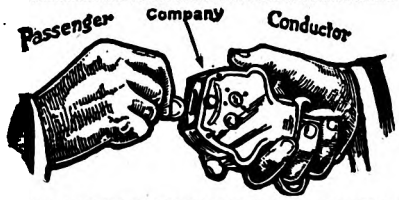
Adjustable

The best changer on the market. Can be adjusted by the conductor to throw out a varying number of coins, necessary to meet changes in rates of fares.

Flexible

Each barrel a separate unit, permitting the conductor to interchange the barrels, to suit his personal requirements and to facilitate the addition of extra barrels.

JOHNSON FARE BOX COMPANY
Ravenswood, Chicago, Ill.



Direct Automatic Registration By the **Passengers**

Rooke Automatic Register Co.
Providence, R. I.

ELECTRIC HEATER EQUIPMENTS

GOLD CAR HEATING & LIGHTING CO.
NEW YORK CITY
PATENTED

THERMOSTAT CONTROL EQUIPMENTS

Address All Communications to
BUSH TERMINAL
(220 36th St.)
Brooklyn, N. Y.
Literature on Request

BUCKEYE JACKS

high-grade R. R. Track and Car Jacks.

The Buckeye Jack Mfg. Co.
Alliance, Ohio

STERLING VARNISH

Manufactured by electrical engineers who will understand your insulating problems and render intelligent service. Noted for uniformity and quality. It will pay you to get in touch with

The Sterling Varnish Co., Pittsburgh, Penna.

SUPER-SEASONED FIBRE

Peerless Insulation Paper has 25 to 50 per cent higher electrical resistance.

S-S TRADE MARK

Hornflex Insulation Paper has no grain. Folds without cracking.

NATIONAL FIBRE & INSULATION CO.
Box 422, Yorklyn, Delaware

A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we build. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut

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Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 5 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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1 to 3 inches.....$4.50 an inch
4 to 7 inches..... 4.30 an inch
8 to 14 inches..... 4.10 an inch

An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

E. R. J.

POSITIONS VACANT

EXPERIENCED car painter wanted for electric railway operating 70 cars in Middle West. P-428, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

ROADMASTER or general foreman for street railway—Eastern city—capable of organizing and directing extensive maintenance and reconstruction work. State experience briefly and salary expected. P-435, Elec. Ry. Jour.

POSITIONS WANTED

AMERICAN, middle age, excellent references, successful record as operating manager combined steam and electric railways and electric light and power properties, wishes to connect with concern needing the services of such a man. Available for personal interview immediately and for service within 30 to 60 days. Inquiries treated confidential. PW-434, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

A GOOD all around car painter, with fine experience, wants position; would do labor by contract or by day. PW-433, Elec. Ry. Journal.

MR. MANAGER, Are you in need of a practical, experienced superintendent of transportation who knows transportation from every angle, successful in public relations, recognized as an economical operator and capable of getting the best out of employees. At present having charge of large city property but desire a change on account of personal reasons. A proven record of 18 years with best of references is back of this advertisement. Would prefer a good size city and suburban property. PW-427, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

EXTRA WORK WANTED

EXTRA engineering work solicited; designing, estimating, planning; computations and drawings. Competently and promptly executed. Mazeau, 1203 Fulton Ave., New York City.

WANTED

RAILWAY BOOSTER

A Shunt Type, with Motor, capacity 1,000 amp. 150 v. boost, or a mach ne approximating these requirements. Please state price and full details.

The Androscoggin & Kennebec Railway Co.
Lewiston, Maine.

FOR SALE

SECOND HAND CARS

trucks and motors

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Phila., Pa.

700 tons new 9 in.

GIRDER RAIL

Penna. Steel Co. Section 228, 107 lb. to the yard. Attractive price upon application. Subject to R. W. Hunt & Company's Inspection. Prompt shipment.

H. M. FOSTER COMPANY
Continental Building, Baltimore, Md.

SEARCHLIGHT SERVICE SECURES SATISFACTORY SALES

2004

"The House of Dependable Service"

NEW and RELAYING

RAILS

of all Sections

HYMAN-MICHAELS CO.

Peoples Gas Building, Chicago, Ill.

Branch Offices:
1324 Woolworth Bldg., New York
2115 Railway Exchange Bldg., St. Louis
1313 First Nat'l Bank Bldg. Pittsburgh

Write or wire when in the market to BUY or SELL

Please Mention this Publication

FOR SALE

12—General Electric 247

MOTORS

TRANSIT EQUIPMENT COMPANY
501 Fifth Avenue, New York.

"Opportunity" Advertising:

Think *"SEARCHLIGHT"* First!

0100

The Searchlight Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

THE BEST PROOF

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable *demand* for such machinery or services, by its readers, the market place which these advertisements represent could not exist for any length of time. Are *you* using the Searchlight Section?

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WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.
Air Receivers & Aftercoolers
Ingersoll-Rand Co.
Anchors, Guy
Electric Service Sup. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Armature Shop Tools
Elec. Service Supplies Co.
Axles
Bemis Car Truck Co.
Cambria Steel Co.
Midvale Steel & Ordnance Co.
St. Louis Car Co.
Standard Steel Works Co.
Axles, Car Wheel
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.
Axle Straighteners
Columbia M. W. & M. I. Co.
Babbitt Metal
Ajax Metal Co.
More-Jones Br. & Metal Co.
Babbitting Devices
Columbia M. W. & M. I. Co.
Badges and Buttons
Electric Service Sup. Co.
Internat'l Register Co., The
Batteries, Dry
National Carbon Co.
Bearings and Bearing Metals
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
General Electric Co.
More-Jones Br. & Metal Co.
St. Louis Car Co.
Westinghouse E. & M. Co.
Bearings, Center and Roller Side
Stucki Co., A.
Bells and Gongs
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Consolidated Car-Heating Co
Electric Service Sup. Co.
St. Louis Car Co.
Benders, Rail
Railway Track-work Co.
Boilers
Babcock & Wilcox Co.
Boiler Tubes
Cambria Steel Co.
Midvale Steel & Ordnance Co.
Bond Testers
American Steel & Wire Co.
Bonding Apparatus
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Sup. Co.
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National Carbon Co.
Westinghouse E. & M. Co.
Brushes, Graphite
National Carbon Co.
Brushes Wire Pneumatic
Ingersoll-Rand Co.
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Anderson Mfg. Co., A. & J. M.
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Brill Co., The J. G.
Mitten-Traylor Incorporated
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Nat'l Fibre & Insulation Co.
Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
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Differential Steel Car Co.
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Cambria Steel Co.
Kuhlman Car Co., G. C.
Midvale Steel & Ordnance Co.
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Electric Equipment Co.
Cars, Self-Propelled
General Electric Co.
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Columbia M. W. & M. I. Co.
St. Louis Car Co
Standard Steel Works Co.
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St. Louis Car Co.
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Archbold-Brady Co.
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Pantasote Co.
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Cutter Co.
General Electric Co.
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Electric Service Sup. Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
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Ohio Brass Co.
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General Electric Co.
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Coil Banding and Winding Machines
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Columbia M. W. & M. I. Co.
General Electric Co
Westinghouse E. & M. Co.
Coils, Choke and Kicking
General Electric Co.
Westinghouse E. & M. Co.
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Electric Service Sup. Co.
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Johnson Fare Box Co.
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Electric Service Sup. Co.
General Electric Co.
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General Electric Co.
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General Electric Co.
Westinghouse E. & M. Co.
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Allis-Chalmers Mfg. Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.
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Ingersoll-Rand Co.
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Westinghouse E. & M. Co.
Connectors, Trailer Car
Consolidated Car Heating Co.
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Electric Service Sup. Co.
Samson Cordage Works
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Couplers, Car
Brill Co., The J. G.
Ohio Brass Co.
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Crossings, Frog and Switch
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Allis-Chalmers Mfg. Co.
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Canton Culvert & Silo Co.
Curtains and Curtain Fixtures
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Electric Service Sup. Co.
Morton Mfg. Co.
Pantasote Co.
St. Louis Car Co.
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Electric Equipment Co.
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Wish Service, P. Edward
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General Electric Co.
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Nat'l Pneumatic Co., Inc.
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General Electric Co.
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Ohio Brass Co.
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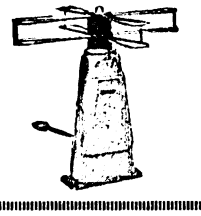

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Pantasote Co.

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Brill Co., The J. G.
Hale & Kilburn Corp.
St. Louis Car Co.

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Brill Co., The J. G.

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Hubbard & Co.

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Electric Service Sup. Co.
Nat'l Pneumatic Co., Inc.

Signals, Indicating
Nichols-Lintern Co.

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Electric Service Sup. Co.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.
Wood Co., Chas. N.

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Nachod Signal Co., Inc.
U. S. Electric Signal Co.

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Slag
Carnegie Steel Co.

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Elec. Service Supplies Co.
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Nuttall Co., R. D.

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Nichols-Lintern Co.

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Brill Co., The J. G.
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Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.

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Brill Co., The J. G.
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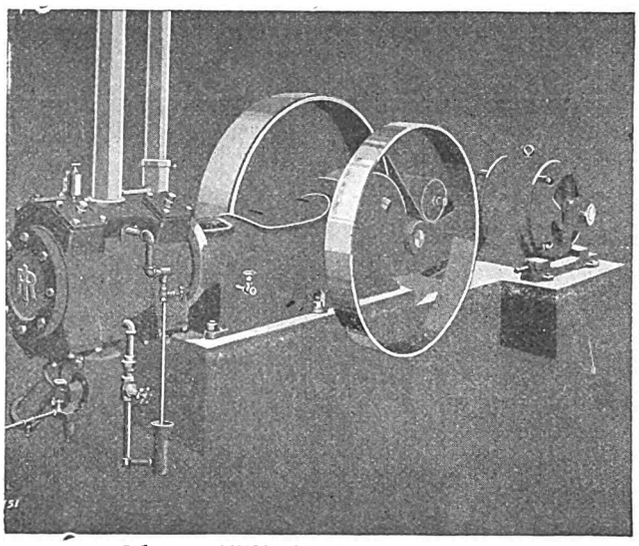

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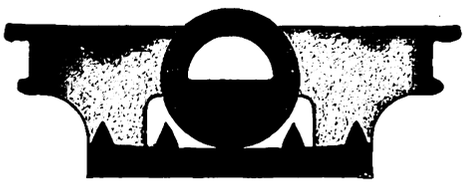

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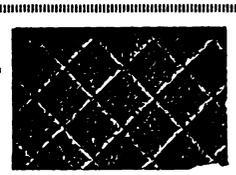

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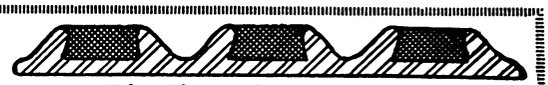

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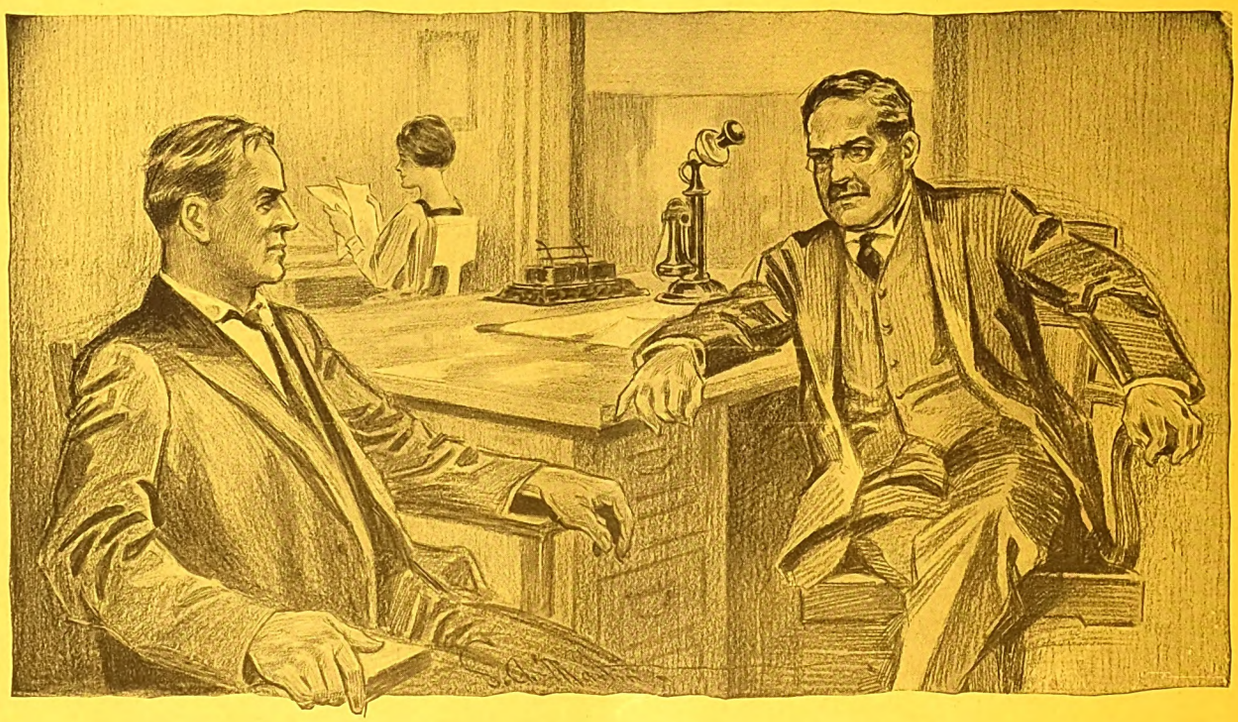

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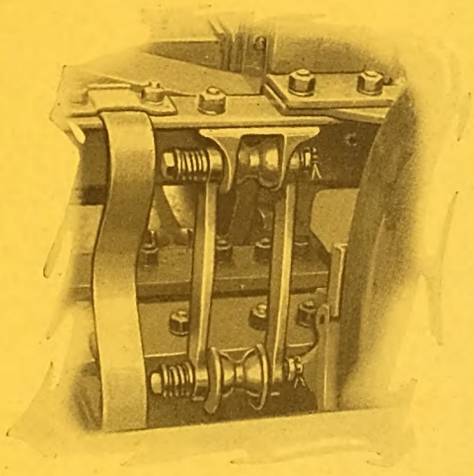

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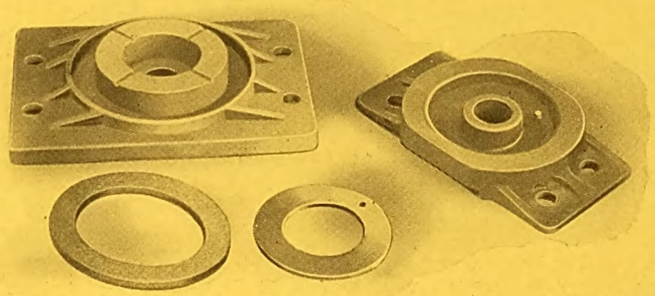

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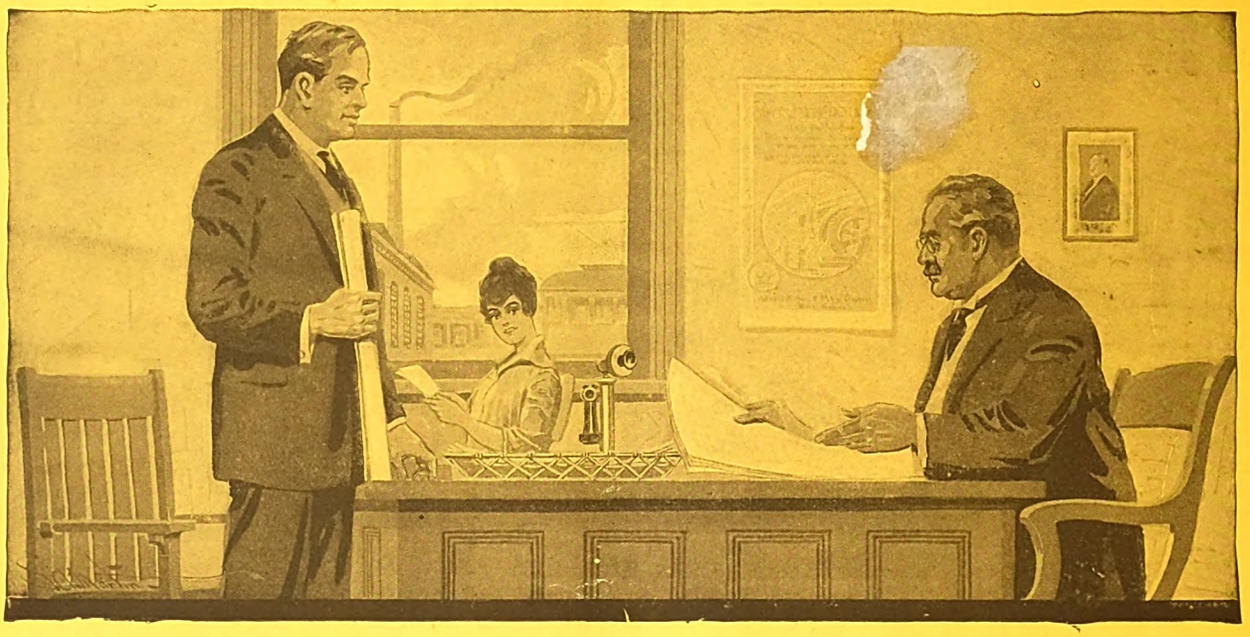

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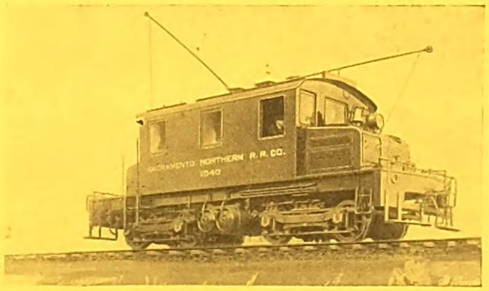

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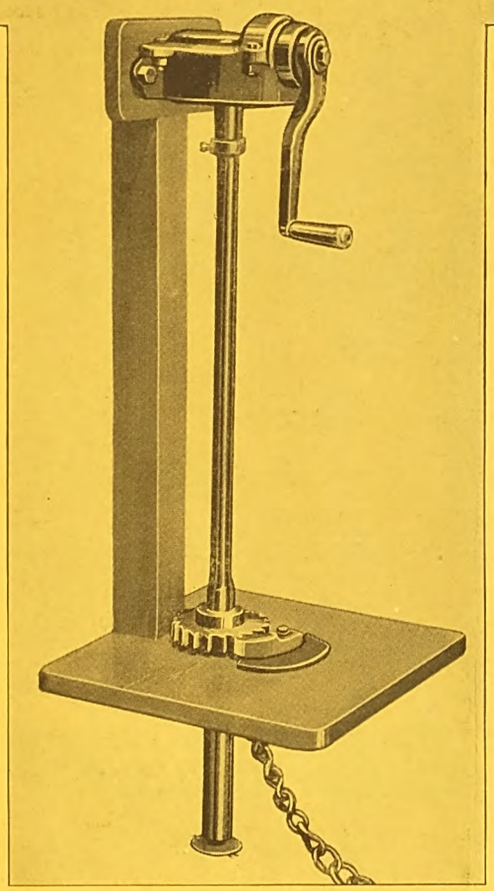

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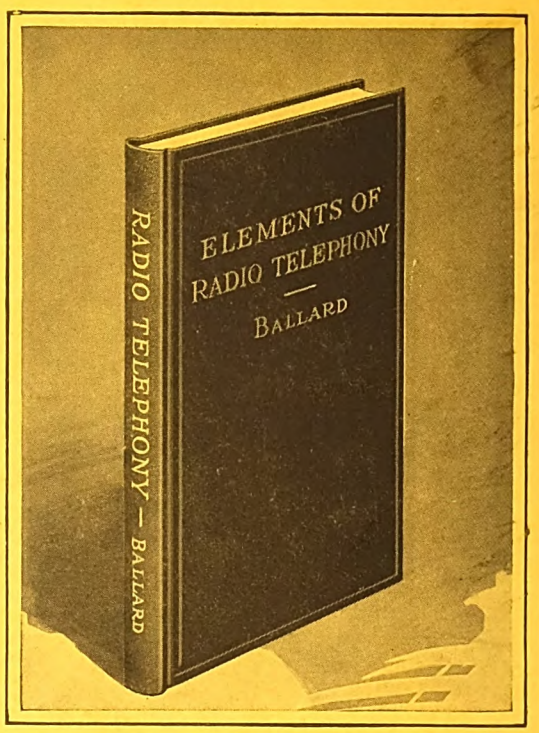

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